

Architecture

# THE CONCRETE AGE

REPRESENTING THE INTERESTS OF MODERN PERMANENT CONSTRUCTION

Entered as second-class matter October 10, 1919, at the Post-office at Dalton, Ga., under the Act of Congress of March 3, 1879.

VOL. XXXII. MONTHLY DALTON and Atlanta, JULY, 1920. \$1.00 Per Year. No. 4

## VINCENT'S TRACING PAPER

The Best Permanent Substitute for Tracing Cloth.

1—Very transparent. 2—Exceptionally strong. 3—Being rolled on a large core it will lay flat on drawing board to the last yard. Others to follow.

In rolls of full 20 yards; 30, 36 and 42 in. wide. Sample from your dealer—or from the maker.

GEORGE VINCENT, 422 E. 53rd St., NEW YORK  
Originator of the Vellum Class of Tracing Paper.

## ECLIPSE Mortar Colors



Superior to All; Reds, Browns, Buff, Black  
Samples on Application

Chattanooga Paint Company  
Chattanooga, Tenn.

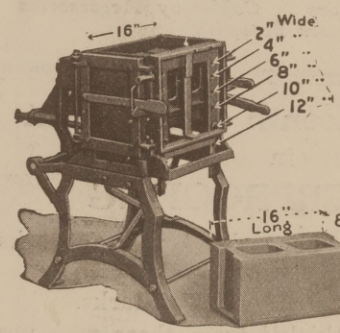
## LUMBER

Long Leaf Yellow Pine and Short Leaf Pine  
Structural Timbers, Factory Flooring, Framing,  
and in fact all kinds of Pine Lumber.

PROMPT SHIPMENTS.

Moss-Downer Lumber Co.  
VALDOSTA, GA.

## MONARCH— King of Block Machines



Notice the Wide Range of Adjustment!

This means that the Monarch will make any size block you may want from silo blocks to foundation stones. Simple, strong, inexpensive. This is the machine for your equipment.

ARE YOU INTERESTED?

Then send a post card asking for complete information and catalog.

Republic Iron Works  
Tecumseh, Mich.

## LIBERTY

The most desired and prized possession on earth are sometimes the alternates to be faced.

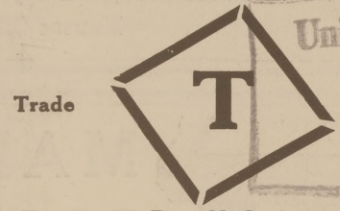
This is particularly true where sanitation is neglected—epidemic among your employes brings business congestion and consequent financial loss to your mill, and death among your employes.

Equip your Standard Septic Outfits and liberty from these dangers and responsibilities is yours.

Write for the proof—

Standard Cement Construction Co.  
Wilmington, North Carolina.  
General Office and Main Plant, Castle Hayne Road.

## Alabama Hewn Oak Timber

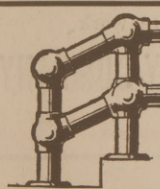


Reg. U. S. A

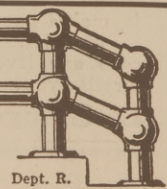
THE S. K. TAYLOR LUMBER COMPANY  
MOBILE, ALA.

University of Texas  
AUG 14 1920  
Mark  
LIBRARY

## IRON PIPE RAILINGS



When in the market for Pipe Railing for Stairs, Bridges or Retaining Walls, send us your drawings. We can quote you prices that will be worth considering.



Dept. R.

PIPE RAILING CONSTRUCTION CO., Long Island City, New York



# SAUERMAN DRAGLINE CABLEWAY EXCAVATORS

are widely used in developing  
local deposits of road gravel

The cost of road construction begins — not with the actual work on the road — but with the first move which is made to get materials ready for the job.

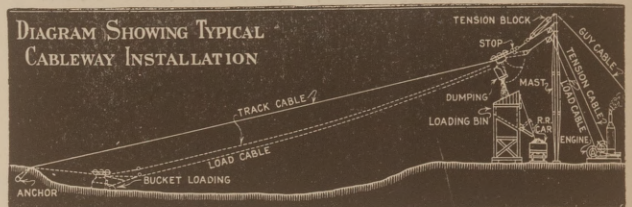
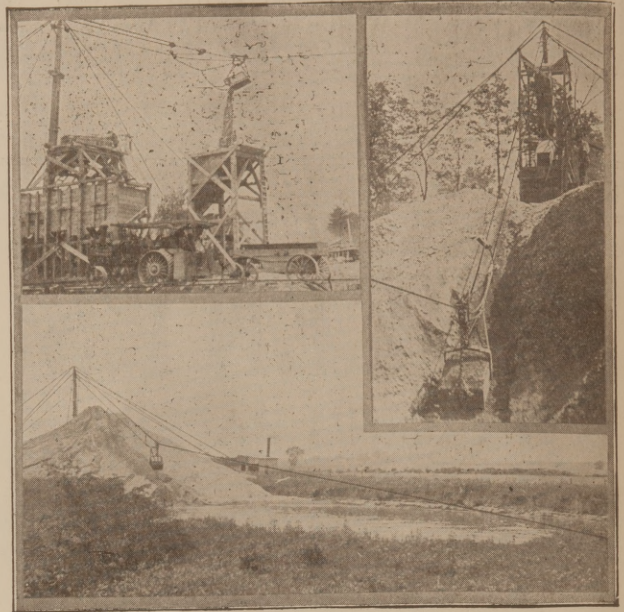
Sand and gravel producers, highway contractors and road commissioners in all parts of the country have proved the great saving which can be effected by installing the Sauerman Dragline Cableway Excavator when materials are to be rushed for a big job of road work.

Write today for literature describing the wide adaptability of this excavator which accomplishes the DIGGING, CONVEYING, ELEVATING and DUMPING of sand and gravel all in one continuous operation, and requires but one man to operate.

## SAUERMAN BROS.

1136 Montross Block, Chicago, Ill.

*Cableway Excavators Cableway Accessories  
Power Scrapers*



## The Eighteenth Amendment in WATERPROOFING

It's always been "bone dry" where Starks Waterproofing has been used.

100 "proof" waterproof—that's Starks.

There's never a "kick" from those who use Starks and they always come back for more.

Write or Wire Us for Prices

**The Starks Mfg. Co.,**

110 Main St.,

Kansas City, Mo.

## ART WORK IN CONCRETE

Start a Business of Your Own.

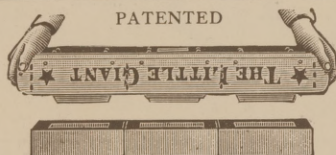
New lines, Methods and products. Concrete  
Marble, Granite and Sanitary Flooring, Etc.

FOR PARTICULARS ADDRESS

## ART STONE CO.

WAYNESBORO, PA.

Lock Box 400



## MAKE BRICK

Make your own concrete brick. Keep you men busy at odd times. Help meet the pay roll with the profits on

### The Little Giant BRICK MACHINE

It makes good, strong, dense brick and saves one-fifth of the material. No pallets required. Discharge the product onto any level surface. The price of the machine will surprise you.

**La Grange Specialty Co., La Grange, Ind.**

For Ornamental Concrete Work, Granolithic  
Floors, Sidewalks, Blocks, Sewer and  
Culvert Pipe and Heavy Concrete

## THE RELIANCE ADJUSTABLE CRUSHER

Will produce Fine or Coarse material at will

**SO FINE**

85% will pass through 10 mesh screen

**OR COARSE**

enough for the heaviest concrete work.

## UNIVERSAL ROAD MACHINERY COMPANY

KINGSTON, N. Y.



**Bale Your Empty  
Cement Sacks  
WITH A  
ROWE SACK BALER**



Makes neatest, lightest bales; works fastest; takes up least space; nothing to get out or order.

Price Only \$13.50  
F. O. B. Galesburg. Order direct from this advertisement.

**ROWE MFG. CO.**  
Galesburg, Ill., U. S. A.

**Clean Your  
Sacks  
Handy Sack  
Baler Co.**



and bale them up right. We do it quick and easy.

Write us.  
**Handy Sack Baler Co.**  
600 S. Second St., E.  
Cedar Rapids, Iowa

**Machinery Covers  
are cheap insurance**

Even though your equipment isn't laid up for long spells, it should be covered over the weekend to prevent tampering and theft of parts.

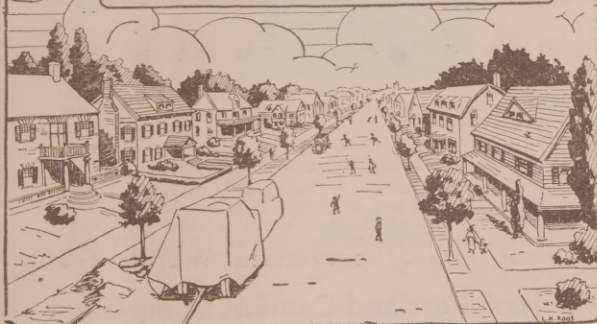
Sound construction and careful treatment give U. S. T. & A. tarpaulins long wear. They stand rough handling. Absolutely waterproof.

Estimates on plain and waterproof coverings will be cheerfully sent you.

*An ounce of covering is worth  
dollars in repairs.*

**UNITED STATES TENT  
& AWNING CO.**

227 N. Desplains St. Chicago, Ill.



**A TYPICAL CONCRETE HIGHWAY**

The Concrete road will be giving good service when the bond issue matures—and for years thereafter. Every mile of Concrete road is a permanent link in a completed county highway system. In no other way can any county hope to complete its road-building scheme. Maintenance of existing roads of other types will soon absorb all possible revenue. Concrete roads mean no mud, no dust, low cost of maintenance and permanence.

WRITE FOR COPY OF "CONCRETE HIGHWAYS"  
WE WILL SEND IT WITHOUT CHARGE

**Dixie Portland Cement Company**

James Building, Chattanooga, Tenn.  
CONCRETE FOR PERMANENCE.

**Buy Kramer Equipment**

—and profit most from  
the big 1920 Block  
and Brick demand

Never have the opportunities for the Concrete Block and Brick manufacturers been so great. The man who uses Kramer Equipment can turn out a high grade product with speed. He is the fellow whose manufacturing cost will be least and his profits most.

Investigate. Prices on request.

**Kramer Automatic Tamper Co.**

Kelley Street, Peoria Heights  
PEORIA, ILL.

**Quality Higher Than the Price**

The X-L All Face Down Block Machine is the only Foot Lever Machine on the market.

The X-L-All has stood the test for 16 years. Over 4,000 now in use.

The X-L-All Block Machine is made with either foot or hand lever.

We furnish a complete outfit with each machine for making Rock or Plain face blocks.

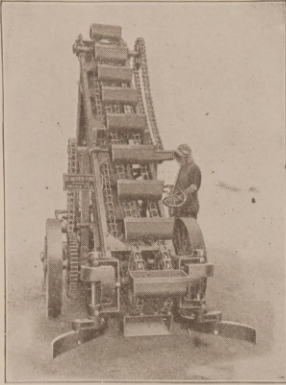
Our Prices will surprise you. Send for Catalogue today.

**BURRELL MFG. & SUPPLY HOUSE**

Box Y-86 Kankakee, Ill.







# AUSTIN Self-Feeding Wagon Loader

Not a so-called self-feeding loader, but a real labor saver for rapid and efficient

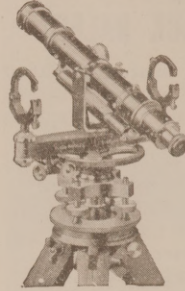
handling of material in concrete road and building construction, excavation work, quarry, storage and reclaiming plants and coal and material yards.

Note the steel feeding arms. In the view they are extended to outside radius of 6 ft. They dig into the material, gather it up and pull it into the elevator buckets. They cut a swath wide enough for the machine to pass through.

## F. C. AUSTIN MACHINERY CO.

NEW YORK OFFICE  
30 Church St.      Railway Exchange, Chicago  
Southern Sales Agents,  
GRAVES MACHINERY CO., Atlanta, Ga.

## No Up-to-Date Builder



can afford to be without a reliable Transit or Level. Our 1920 Model

### "STERLING" CONVERTIBLE LEVEL

may cost a little more at the start, but its special features will save enough valuable time to more than repay the additional outlay. Free examination privilege. Easy payment plan.

Our Illustrated Pamphlet C contains valuable information on the selection of up-to-the-minute Leveling Equipment. Write today for your copy.

WARREN-KNIGHT CO., 136 N. Twelfth St., Philadelphia

Vest Pocket Manual of Adjustments Free.

## Wet Mix Concrete Men, Attention!

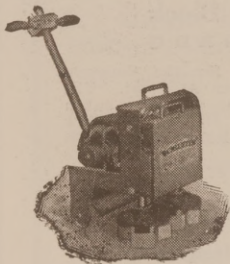
"McAdamite" is something new. Nothing like it on the market. Absolutely prevents cement from sticking to the forms and product comes out with a smooth, glossy surface, resembling the work of a trowel. Saves more than the price of other oils in labor. Gallon lots \$1.25 per gallon. Five gallons or more, \$1.00 per gallon. Money back if not satisfied.

## McADAM CEMENT WORKS

315 E. 5th Street

Aledo, Illinois

## The IMPROVED Rapid Floor Surfacer



will surface *right up to the wall or baseboard* without the use of Edge Roller. Just the machine you would want for surfacing all kinds of floors, whether old or new. Will smooth down rapidly and easily all joints or warped edges. *Perfect results guaranteed.* More than 20,000 in use.

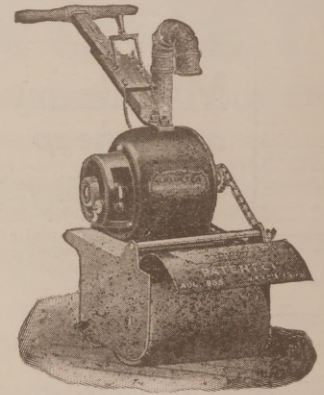
Send for our free trial offer.

### M. L. SCH UETER

225-27 W. Illinois St.

CHICAGO, ILL.

Phone Main 2349



Made in several sizes.

Several sizes. Extra 2-disc attachment can be removed making a 2-disc machine.



## Dustless—Non-Slippery—Always Serviceable—Lowest Maintenance

The use of concrete for road and street construction is increasing rapidly throughout the country.

The experience of those communities which have built concrete highways has proven beyond question that concrete not only gives the most substantial construction, but also solves the perplexing question of maintenance because

### Concrete Practically Eliminates Maintenance.

With sand and gravel or crushed rock available locally throughout the South, and Portland Cement—manufactured here at home, the cost of Concrete roads is very low. Concrete roads are an INVESTMENT—not an EXPENDITURE.

Send for our Booklet, "CONCRETE HIGHWAYS." Free on request.

## Standard Portland Cement Company

J. I. McCANTS, Sales Mgr.  
Birmingham, Ala.  
CONCRETE FOR PERMANENCE



# LOOK HERE!

The demand for Ohio Concrete Roofing Tile is greater than ever this year. The man who is equipped to meet this demand in his locality will control a highly profitable and clean cut business of his own.

A single 2 machine unit of Ohio Tile Machines will manufacture all the regular and special shapes required for any roof,—and with a net profit of over \$50 a day for you!

Write at once if you want information.

## *The* OHIO TILE MACHINERY Co

WILLOUGHBY, OHIO  
(Near Cleveland)

# SILO HARDWARE

We are in a position at all times to furnish silo accessories of all descriptions for any make silo—we carry a full and complete stock on hand and can make immediate delivery from our warehouse on carload or small shipments.

Our goods are made from the best material obtainable—and are guaranteed.

Secure our inducements before placing your orders. We aim to give satisfaction. Prompt service and a square deal assured on all orders large or small.

A trial order will convince you.

If you are just beginning to manufacture or build silos—let us help you get started right—we will be more than pleased to aid you in any way possible.

We can furnish any quantity

SILO Rods  
Lugs

Wood or Steel  
Doors

Door Spreaders  
Reinforcements

Reinforcing Steel,  
Twisted or  
Deformed

Galv. Iron Chutes  
Metal Roofs  
Cement Stave

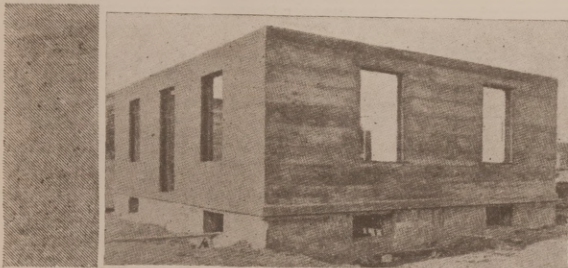
Machines,  
Moulds, Etc.

SMITH SILO HARDWARE CO., 11th and Market Sts.  
Des Moines, Iowa

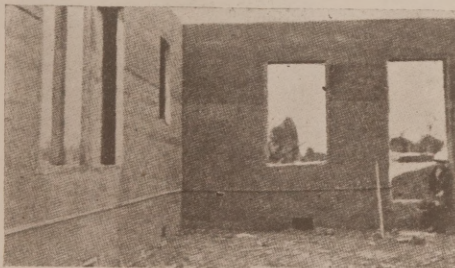
### FOR SALE OR LEASE.

A complete concrete products plant, consisting of two "Ideal" block machines, 800 staple post molds, mixer and conveyor, motor driven. Switch track to building. Ten acres of abandoned cement tunnels with an even temperature of 55 degrees Fah. the year around, for curing and storing. The plant is located on a one acre plat in the wealthiest farming community in the state. For particulars, address,

Portland Cement Products Company,  
Utica, Illinois.



# ACME Hollow Wall System

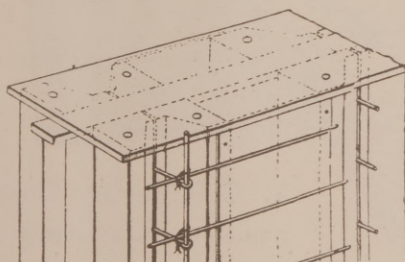


Speed and low-cost in building hollow walls—your bid low enough to get the business—high enough to make good money—and the speed gets you away to the next job in a hurry. That's how the Acme System works.

In building the one-story house (shown above) at Phillipsburg, N. J., on the Ingersoll-Rand property, 3 men erected all the form work in one day, and 5 men poured the entire walls above grade in 9 hours, carrying the concrete in buckets up a ladder.

With this system, simple wood forms are built 12 ft. high or higher. Ribs inside the airspace in the wall give strength—they act as pilasters.

Write for full details and explanation of other Acme advantages.



Acme Hollow Wall Co.,

Madera, Calif.



**BELMONT**  
PHILADELPHIA

**IRON**  
NEW YORK

**WORKS**  
EDDYSTONE

ENGINEERS—CONTRACTORS—EXPORTERS

**STRUCTURAL STEEL**

COMPLETE INDUSTRIAL BUILDINGS

MAIN OFFICE & WORKS, PHILA.,  
22d & WASHINGTON AVE.

CABLE ADDRESS  
"BELIRON"



NEW YORK OFFICE  
15 PARK ROW

Code Western Union  
fire letter addition.

*Illustrated catalog in English, French and Spanish  
mailed on request.*

*Complete Warehouse Stock of Structural Shapes and  
Plates for Immediate Shipment.*

## Pipe Couplings

We will buy your couplings in any quantity,  
large or small. Write us what you have.

**A. & J. Manufacturing Co.**

557 West Lake Street,  
Chicago, Ill.

## REFINEMENT IN DETAIL



As here shown, will be found in all of our moldings and ornaments. Let us estimate on all your plastic relief and composition work. Let us lay before you more clearly the character of our work.

**NATIONAL PLASTIC RELIEF CO.**  
330 Main Street, CINCINNATI, OHIO

## Multiple Oval Cores allow use of Wet Mixed Concrete

We are the originators of the core method whereby the small oval openings in block guarantee against collapse. Thus wet material can be employed. Simplest and best method for production in various lengths of block.

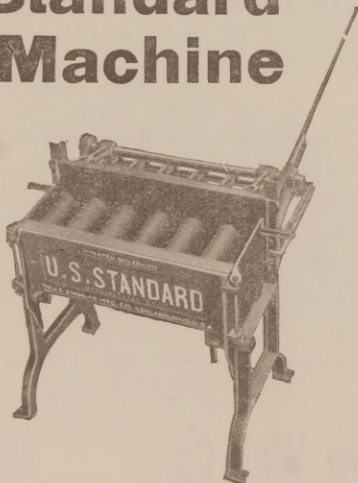
Our coring system allows for plenty of wall ventilation giving air space from top to bottom of wall.

Machine makes hollow or outside blocks and thin blocks for veneer and inside partitions.

U. S. Standard block are made face-down and are dense, strong and waterproof.

## U. S. Standard Block Machine

Ask for details about this—one of the oldest and most widely used block machines on the market.



**U. S. Standard Manufacturing Co.**

Formerly of Ashland, O.

Columbiana,  
Ohio

## STOCK FIRE PROOF DOORS

Metal Covered

Standard Sizes in Stock of all Designs, with Frames and Trim

Write for Booklets and Price List



**A. C. Chesley Co. Inc.**  
279 Rider Ave., New York, N. Y.



# THE CONCRETE AGE

DALTON and Atlanta GEORGIA

VOL. XXXII. July, 1920. No. 4

Says New Orleans Is First.

PUBLISHED MONTHLY

Devoted to Modern Permanent Construction.

CONCRETE AGE PUBLISHING CO.

SUBSCRIPTION RATES.

In the United States and Possessions (Hawaii, Phillipine Islands and Canal Zone), Mexico and Cuba, \$1.00 per year. Canada, \$1.50. All other foreign countries, \$2.00 per year.

Advertising rates given upon application.

Entered as second-class matter October 18, 1905, at the Post-office at Atlanta, Ga., under the Act of Congress of March 3, 1879.

The Editor solicits correspondence from readers on matters pertaining to the concrete industry. Descriptions of concrete work done anywhere that is of general interest accompanied by clear, sharp photographs and going into details as to methods employed will be published and paid for if found acceptable.

## TO OUR ADVERTISERS.

*Our advertisers are requested to have copy and cuts for changes for advertisements in this office not later than the 10th preceding the month for publication.*

*We cannot be responsible for changes not made, when copy and cuts are received later, or submit proof.*

## TABLE OF CONTENTS.

Editorial .....	7-8
Street and Road Construction .....	10
Protest any Road work Stoppage .....	13
Safety Factors in Use of Explosives .....	17
Cement Discounts and Uniform Prices .....	18
As Natural As Nature Itself .....	20
Georgia's New Road work Contract .....	22
Organization the Keynote .....	24
Make Your own Well Tiling .....	26
Permit Use Hydrate Lime in Concrete .....	27

The Concrete Age has received the following communication from Mr. Howard Eggleston, Consulting Engineer, New Orleans, La.:

"I am surprised to find you giving Seattle credit for the first municipally owned grain elevator. The Port Commissions of our city built in 1916-17 a publicly owned concrete elevator with a capacity of 2,622,000 bushels, and a loading and unloading capacity in excess of that claimed by Seattle. In this matter the South is very creditably represented."

Now this is good news to Concrete Age and we heartily congratulate New Orleans on such a notable achievement. The article above referred to was taken from a newspaper clipping and appeared in our May number.

## Why Have An Inspector?

Why have an inspector? Is he on a job to do police duty; to prevent petty thievery; or is he there as a trained expert to know and to show how the work should be done and to see that it is properly done? Is the inspector's role on a job, in a way, chiefly to catch wilful or unwitting violations of specifications governing the particular work in hand?

Too many people have the policeman idea of the inspector's job.

Of course there are contractors, foremen and workmen who take advantage if the opportunity offers and blight any part of the work where they may hope or see a chance to get by. This type of men, of course must have an inspector whose role is guardman, watching him at every turn. Every hopper full of material he prepares must be closely watched and scrutinized. In this kind of a situation the inspector necessarily becomes, in addition to his duties as expert, more or less a detective or guard. His position deteriorates into a policing job. Such a role should not be necessary for an inspector. He, above all others, should be the expert with the best and fullest knowledge of the job at hand. \* \* \*

The role of inspector is an important and dignified one. He should assume such a mental attitude and so conduct himself that the men with whom he works respect first, his knowledge of the work, and then himself personally. There is a certain dignity



that goes with absolute knowledge of the job in hand and a man's own confidence in this knowledge commands respect from those with whom he works. Couple this dignity, confidence, knowledge and ability with a firm and manly attitude toward the crew with whom he works and the inspector should never find it necessary to deteriorate into a mere policeman, or guardsman on the job.—From Iowa State Highway Service Bulletin.

#### Competent Inspection Best Insurance.

No better insurance of first-class concrete road, street and alley construction can be secured than competent inspection—for competent inspection means that every detail of first-class design and specifications will be correctly carried out in the work and the job will be a credit to its type. It is the most mistaken economy for a municipality, county or state to neglect or limit the quality of supervision given to any public work authorized by the taxpayers.

In most communities the manner in which contracts may be awarded is fixed by law. Contractors are requested to make proposals for certain work by offering unit prices on stipulated quantities or by bidding a lump sum to cover the entire job, and the contract is usually awarded to the lowest bidder. Quality of the resulting work must depend largely on the integrity and skill of the contractor. The usual practice of making awards on the low bid may result in giving the job to a contractor who has figured so small a profit that he becomes more interested in protecting his margin than in producing high grade work.

To insure satisfactory results, taxpayers should be prepared to pay a reasonable price to a contractor who has demonstrated his ability and character. Under such conditions the work will render a satisfactory return on the investment.

As the burden of securing honest construction is placed by taxpayers on their public officials, the responsibility of the engineer is easily appreciated. A community can make no greater mistake than to attempt saving money by failing to provide adequate engineering supervision.—Concrete Highway Magazine.

#### The Highway Engineer

It is highly significant and cheering, thinks Southern Good Roads, that of the one hundred and twenty-seven technological schools in the United States one hundred and fifteen are now offering courses in highway engineering. This means that numbers of experts will be available to give counsel and effectiveness to popular sentiment for highway

improvement—a fact of vital importance, for while sentiment and enthusiasm are essential to success, they “must be tempered and controlled by knowledge before they can accomplish much.”

Had the importance of highway engineering been rightly appreciated a decade or so ago, millions of tax money would have been saved and the country's road construction advanced incomparably beyond what it is to-day. Few fallacies indeed have been so costly as the once prevalent idea that road-building was mainly a matter of manual labor, and unskilled labor at that. When counties and states slouched on in the notion that a pick and shovel eked out by a lick and a promise could build a worthwhile road or keep it in repair, progress in this great field of public service was impossible. There was no inspiration to good highway construction for the simple reason that there were no examples of it. A summer's make-shift work would be beaten and blown away by the ensuing winter's storm, so that even the paltry sums of money spent in this piddling process amounted to extravagance.

Even after the high tide of good roads enthusiasm swept over the country there were grave losses and backsets because in their impatience for improvement communities would not take the pains to secure competent counsel and practice scientific methods. The people were warmly willing to vote bonds and officials were eager to get speedy and substantial results, but in all too many instances they failed at first to perceive the importance, the fundamental importance, of special training, foresight and skill in road-building. They overlook the fact that road-building is a science and an art, which cannot be successfully undertaken save under the guidance of minds grounded in its laws and capable of directing its processes. The fact that so many technological schools are now offering courses in this science and art indicates a general awakening to the need, and at the same time serves as a valuable stimulus to further progress upon the same lines.

The time is at hand when no state or county would think of trying to build highways without competent engineers any more than it would try to build a court house without a dependable architect and supervisor. The result will be not only better roads, but cheaper roads, and more of them.—Atlanta Journal.

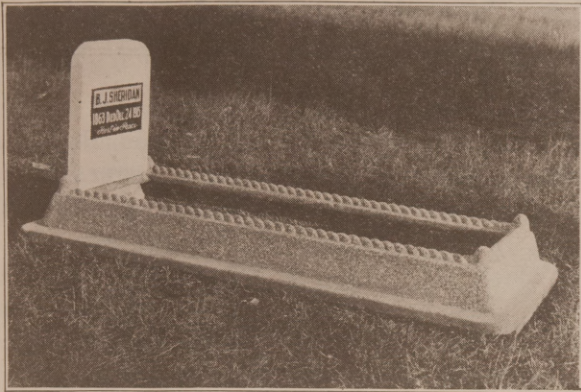
#### Concrete and Cement Plants.

Camden, S. C.—Cement Bricks.—A. D. Kennedy, Jr.; erect sheds; mfre. cement bricks.

Wheeling, W. Va.—Concrete Products.—Concrete Products & Building Co., 622 Wheeling Bank & Trust Co. Bldg., organized; erect plant; mfre. cement roofing tile, building blocks, bricks, reinforced cement posts, etc.



## Grave Marker and Coping Molds



Patent Pending.

Our molds make money fast for concrete products manufacturers. The products sell readily and give excellent satisfaction.

Central Cemetery Co., Cook Co., Ill.: "Your base protection is a splendid idea."

Mrs. L. Truska, Blue Island, Ill.: "The concrete monument and 5 copings are more than satisfactory."

Write for catalog of molds for making tombstones, grave-coping and other ornamental products.

**KEMPER GRANITE MOLD CO.**

865 Transportation Bldg.

Chicago, Ill.

## Carpenters Wanted as Special Representatives

**C**ARPENTERS and others are making big money. It's right in your line. Fenton, of Indiana, made 400 sales in one week; Woodard sold 47 the first day. You, too, can sell the

**The Henry Airtight Weatherstrip**  
(Automatic)

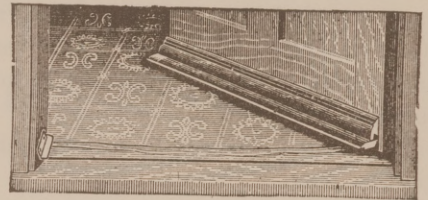
for the bottom of doors and hinged windows. It's automatic. Fits down tight against worn sills as well as new ones. Keeps out every bit of cold, snow and rain and dust. Saves fuel. Sells fast; everybody wants it for economy's sake. Simple; easy to put on. Approved by architects, carpenters, and builders wherever known.

*Send now for money-making plans.*

### The Henry Airtight Weatherstrip Co.

510 Elm St., Crawfordsville, Indiana

This attachment automatically shuts the strip tight against the sill



## "Perfect" Concrete Brick Power Machine

**C. S. WERT - Inventor and Patentee**

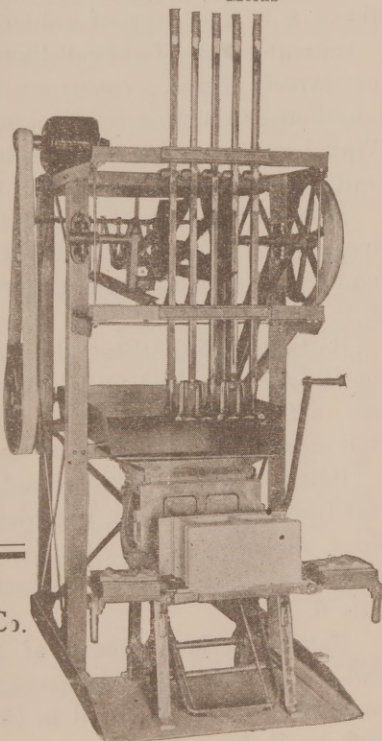
Turns out, with four men, 16,000 to 20,000 concrete bricks in ten hours.

In severe tests, Perfect Concrete Brick have proven stronger than common clay and pressed clay brick.

The power tamper may be operated by a one horse power motor, a 2 1/2 horse power gas engine or direct from a line shaft.

"There is no better brick machine manufactured," says W. T. Sharp, of Montana, owner of a Perfect brick plant.

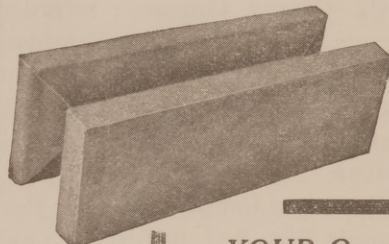
*Get facts and figures now. Write while the matter is on your mind.*



Manufactured by  
**The Sealer Distributing Co.**  
2553 Railway Exchange  
Bldg.  
CHICAGO

Late Model—Gearless and Noiseless.

Also  
Hand and  
Power Block  
Machines  
Hand Brick  
Machines  
Well Cistern  
and Silo  
Molds



**CLIMAX**  
Slush Poured  
Block

### YOUR Opportunity

The Block  
Flint hard,  
8x8x24" and  
8 x 12 x 24,"  
Maximum air  
space assures  
perfect insula-  
tion.

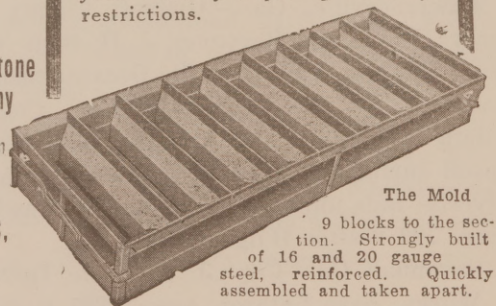
No longer is there a valid reason why you can not profit from the big demand for slush-poured blocks. CLIMAX molds are made right. They turn out uniformly good blocks so quickly and with so little labor that no other blocks can compete with them in cost—and they can be sold for more.

No large investment. You can start with as few molds as you want. We do not limit your sales by imposing territory restrictions.

**S. P. Stone  
Company**

100 Arcadia  
Avenue.

**COLUMBUS,  
OHIO.**



The Mold  
9 blocks to the section. Strongly built of 16 and 20 gauge steel, reinforced. Quickly assembled and taken apart.



## News of Street and Road Building Activity in the South Briefly Told

**N**EVER before in the history of the country has the South seen such active preparations being made and now underway in some parts for permanent road building of all sorts. For years the South has lagged in this respect, but the people are now speaking in no unmistakable terms, through the ballot, that they must have bond issues to carry on the good work.

This magazine is giving as briefly as it can the news of this activity, strictly confining itself to the South, though all states in all parts of the country are waking up.

### Road and Street Construction.

Athens, Ala.—City, Ernest Hine, Mayor; pave 16 mi. streets; brick and macadam; storm sewers; \$25,000; contract to Merril Road & Construction Co., Chattanooga, Tenn., for brick work and storm sewers; Alabama Asphalt Co., Birmingham, Ala., for curb, gutter and macadam work; A. P. Henderson, Engr., Athens.

Montgomery, Ala.—City Comsn.; pave roadway of Lirden and Hall Sts.; construct sidewalks on Goode St.; H. A. Washington, City Engr.

Mena, Ark.—Polk County Comms.; awarded \$379,942 road contracts; Early & Jones, Sheridan, Ark., 23 mi. Mena-Big Fork; Maxwell Construction Co., Columbus, Kan., 16 mi. Mena-Oklahoma road; Buckley-Forgy Engineering Co., Engr., Planters' State Bank Bldg., Mena.

Osceola, Ark.—Mississippi County Comms., Burdette Road Improvement Dist. 3, J. S. Birchel, Commissioner; improve roads; 30,000 cu. yds. excavation; 10.3 acres grubbing; 7.4 acres clearing; bids until June 23; Prude & Fairley, Engrs.

Wynne, Ark.—Cross County Comms., Tyronza and St. Francis Road Improvement Rists.; improve 15 mi. road; bids until June 28; W. S. Newsum, Engr.

Homestead, Fla.—City; repair streets; voted \$15,000 bonds. Address The Mayor.

Albany, Ga.—City; pave streets; voted \$28,000 additional bonds. Address The Mayor.

Lawrenceville, Ga.—Gwinett County Commissioners, Roads and Revenues, J. H. Britt, Clk.; construct 14.22 mi. Lawrenceville-Decatur road between Lawrenceville and Gwinett-De Kalb County line; Federal Aid Project 117 and 162; 35,651.42 cu. yds. topsoil surfacing; 17,950.3 lbs. reinforcing steel in culverts; bids until July 15; Joe W. Hawkins, Div. Engr., 703 Walton Bldg., Atlanta, Ga.

Savannah, Ga.—City; J. W. Motte, Director Public Works; pave Lathrop Ave.; 2,387 ft. long, 24 ft.

wide; invite bids.

Trenton, Ga.—Dade County Comms. Roads and Revenues, I. H. Wheeler, Chrmn.; construct 4.33 mi. topsoil road on Chattanooga-Birmingham road; 11,295 cu. yds. topsoil surfacing; bi's until July 15.

Winder, Ga.—City, J. R. Arnold, Clk.; pave streets; brick, concrete, sheet asphalt, asphaltic concrete or bituminous concrete; sanitary sewers, etc.; bids until July 2; changed date from June 7; J. B. McCrary Co., Engr., Atlanta, Ga.

Winder, Ga.—Barrow County, H. G. Hill, Ordinary; construct 11.3 mi. Jefferson, Winder, Monroe road between Jefferson and Monroe Counties; Federal Aid Projects 128 and 148; 19,908.9 cu. yds. topsoil surfacing; bids until July 14; Joe W. Hawkins, Div. Engr., 703 Walton Bldg., Atlanta, Ga.

Danville, Ky.—City, L. P. Evans, Mayor; construct 33,000 sq. yds. street paving; sheet asphalt, bithulithic, bitoslag, willite on 5 or 6 in. base or two-course concrete; 5,000 ft. sewers; bids until July 6; changed date from June 24; S. F. Creelius, Civil Engr., Richmond, Ky.

Hazard, Ky.—City; J. D. Davis in charge; improve streets; 3 mi.; \$140,000 available; R. L. Peters, Contr., Knoxville, Tenn.; Wm. Pursifull, City Engr.

Shelbyville, Ky.—City; reconstruct Main St.; concrete pavement; \$12,688; pavement on Adair Ave.; \$12,054; rock asphalt pavement on Washington St.; \$12,952; reconstruct 5th St.; rock asphalt; \$4,623; Metzel & O'Hern, lowest bidders.

Columbia, La.—Caldwell Parish Police Jury, Monroe Jarrell, Prest.; construct 9.78 mi. Columbia-Jonesboro; Columbia-Harrisonburg; 3 mi. Columbia-Winnsboro; 4 mi. Bouef River and 1.52 mi. Cane Hill road; bids until July 6. (See Machinery Wanted.)

Monroe, La.—Ouachita Parish Police Jury, J. M. Breard, Jr., Prest.; grade, drain and surface 4.46 mi. road from Columbia road; gravel; bids until July 14; R. P. Boyd, Parish Engr.

Baltimore, Md.—State Roads Comms. 601 Garrett Bldg.; pave 1.94 mi. Belair Road from old city line to Hamilton Ave.; sheet asphalt on stone base; Baltimore City, Contract BC-35; bids until July 7.

Baltimore, Md.—State Roads Comms., 601 Garrett Bldg.; pave 2.1 mi. Philadelphia Road from end sheet asphalt to city line; sheet asphalt on stone base; Baltimore City, Contract BC-34; bids until July 6.

Baltimore, Md.—Board of Awards; grade curb and pave with cement concrete and sheet asphalt on concrete base street listed in Contract 172 and 173; bids until June 30.



## The Concrete Age And Its Promotion Work.

Every month, for fifteen years, The Concrete Age has been the sole missionary in the South, preaching the gospel of concrete fireproof construction. It has printed thousands of pages of text, and thousands of illustrations to drive home its arguments.

Every month, for fifteen years, The Concrete Age has likewise been relentless in advocating the building of concrete roads. It has devoted a vast amount of space and thousands of pictures to this subject and today this work is bearing fruit in the assured building of the Dixie Highway and other great road systems.

For fifteen years, The Concrete Age has had its leading articles copied by the big papers of the South, where they reached millions of readers and in this way doubled its power and influence in pleading for concrete fireproof buildings and concrete roads.

For fifteen years the paper has not only covered the fourteen Southern States, but the Middle-West as well. It has been a power in its particular field and has contributed millions worth of new business to those who seek trade from the concrete industry.

Mr. Advertiser, have you fully appreciated the ceaseless efforts and influence of this paper? We are rendering missionary work which creates new business for your products every month, and The Concrete Age deserves your patronage and support. Give us this, in full measure, and enable us, through your help, to largely increase the practical influence the paper is exerting in your behalf.

**CONCRETE AGE PUBLISHING CO.**  
**AL ANTA, GA.**

Cumberland, Md.—City; improve streets; 13,800 sq. yds. brick, 4,900 sq. yds. concrete and 2,050 sq. yds. asphaltic bound macadam paving; 11,100 lin. ft. concrete curb; bids opened June 22; Ralph L. Rizer, City Engr.

Elkton, Md.—Cecil County Commrs.; gravel road from Calvert to Farmington; 3 mi.; contemplated.

Havre de Grace, Md.—City; macadamize 13 blocks on Washington St. Address The Mayor.

Baldwyn, Miss.—City, W. S. Stocks, Mayor; grade and gravel streets in residence section; 4,800 cu. yds. grading; 5,500 cu. yds. gravel; \$21,000 bonds; construction bids July 1; Tupelo Engineering Co., Engr., Tupelo, Miss. Lately noted voting bonds.

Gulfport, Miss.—Harrison County Commrs.; construct roads in Beat 2; vote July 6 on \$100,000 bonds.

Laurel, Miss.—City, J. H. Pace in charge; construct  $\frac{3}{4}$  mi. road; grade and gravel; resurface old road; \$15,000 available; bids until July 12; F. B. Ross, Engr.

Laurel, Miss.—City, F. A. Smallwood, Clk.; improve streets and water-works; voted \$50,000 bonds.

Meridian, Miss.—Lauderdale County, Geo. A. Gray, Chrmn., Beat 4, Good Roads Comsn.; construct Meridian and Hickory Rd.; 60,000 cu. yds. excavation; bids until July 6.

Moss Point, Miss.—City; pave Main St.; issue \$10,500 bonds. Address The Mayor.

Clayton, Mo.—St. Louis County Commrs.; pave 1.392 mi. Mason road; bids until June 22; grade and pave 1.47 mi. Reavis road; .47 mi. Susan Ave.; .279 mi. Kennerly; W. Elbring, Engr.

Carthage, Mo.—Jasper County Commrs.; construct 2.76 mi. Joplin-Carthage road; Federal Aid Project 81; 29,259 sq. yds. concrete pavement; bids until June 25.

Clayton, Mo.—St. Louis County Commrs.; grade and pave Olive St. road; 2.123 mi.; cement concrete pavement, granite wearing surface; \$125,805; grade, construct bridges and culverts on Page Ave.; 3.355 mi.; \$52,813.45; bids opened June 22; Wm. Elbring, Highway Engr.

Fulton, Mo.—Callaway County Commrs.; construct 18 mi. Fulton-Jefferson City road in New Bloomfield Special Road Dist.; Federal Aid Project 97; 59.110 sq. yds. gravel surfacing; 39,925 sq. yds. macadam pavement; bridges.

Greenfield, Mo.—Dade County Commrs.; improve 5 mi. Lamar-Springfield road, 24 ft. wide; Federal Aid Project 106; 26,400 sq. yds. clay-bound macadam surfacing; bridge.

Jackson, Mo.—State Highway Dept.; improve 3.18 mi. Kings highway in Cape Girardeau township; Federal Aid Project 52; erect Whitelaw and Cape La Cruz bridge; Rouse, Hely & Keller, Contrs.

Jefferson City, Mo.—City; resurface 34,330 sq.



yds. streets; bituminous macadam; sewers in Dist. 25; bids until June 22; L. F. Brown, City Engr.

New Madrid, Mo.—New Madrid County Comms.; grade and construct culverts on 19.3 mi. state road from New Madrid; Project No. S 18.93, Section A; bids until July 5; C. V. Hansen, Highway Engr.

New Madrid, Mo.—New Madrid County Comms.; improve 19.3 mi. Section A. State road, Project S-18.93; bids until July 5; C. V. Hansen, Highway Engr.

Ozark, Mo.—State Highway Dept., Jefferson City, Mo.; construct 9.31 mi. Springfield-Hollister road, 24 ft. wide; let contract.

St. Louis, Mo.—City, H. W. Kirl, Mayor; reset curb, repair base and pave streets.

Rutherfordton, N. C.—Rutherford County Commissioners; construct sand-clay road; vote July 20 on \$10,000 bonds.

Yanceyville, N. C.—North Carolina State Highway Comsn., Div. Office, Greensboro, N. C.; completed surveys for 7 mi. topsoil road between Rockingham and Virginia state line.

Madill, Okla.—City; pave 55,000 sq. yds. streets; bids about July 10; Johnson & Benham, Conslt. Engineers, Firestone Bldg., Kansas City, Mo.

Oklahoma City, Okla.—State Highway Dept.; construct highway; invite bids; Robert C. Terrell, State Highway Engr.

Stigler, Okla.—Haskell County Comms.; construct gravel road; 7 mi.; vote July 20 on \$75,000 bonds.

Charleston, S. C.—City, J. H. Dingle, City Engr.; construct 10,000 sq. yds. sheet asphalt pavement; bids until July 6. (See Machinery Wanted—Paving.)

Kingstree, S. C.—Williamsburg County Comms.; construct 8.504 mi. Manning-Kingstree road between Clarendon county line and Black river; F. A. Project 80; 20,308 cu. yds. sand-clay surfacing; 2,587 lbs. steel reinforcement; bids until July 7; J. M. Martin, County Engr.

Lexington, Tenn.—Henderson County Comms.; construct roads; voted \$350,000 bonds.

Canadian, Tex.—Hemphill County Comms., W. D. Fisher, Judge; construct 14 mi. road; clay surfacing; \$70,000 available; bids until July 1; Hess & Skinner, Engrs., Amarillo, Tex. Lately noted.

Cleburne, Tex.—Johnson County Comms.; grade, drain and erect bridges on various highways; gravel; concrete with bituminous macadam surface Cleburne-Fort Worth road; construction by day labor.

Fredericksburg, Tex.—Gillespie County, A. H. Kneese, Judge; construct 50 mi. gravel and crushed rock surface road; \$350,000 available; contract for 18 mi. awarded to M. M. Craven, Belaire, Tex.; A. F. Moursund, Engr. Supersedes recent item.

Mount Pleasant, Tex.—Titus County Comms., J. W. Tobb, Judge; gravel 100 mi. roads; erect concrete bridge structures; \$1,000,000 available; Smith Bros. Contr.; H. S. Wilder, Engr.

Post, Tex.—City, T. R. Grenfield, Mayor; pave streets; \$20,000 or \$30,000 available; V. A. Robinson, Engr.

San Angelo, Tex.—Tom Green, County Comms.; grade and pave 10 mi. State Highways 9 and 9-A, 18 ft. wide; asphalt on concrete base; Smith & Hicks, Contrs., Hillsboro, Tex.

San Marcos, Tex.—Hays County Comms.; grade gravel and drain 18.9 mi. Highway 29-B; Federal Aid Project 178; J. W. Puckett, Engr., Buda, Tex.

Waxahachie, Tex.—Ellis County Comms.; surface and erect bridges and culverts on 11.5 mi. Highway 14; 121,400 sq. yds. bituminous macadam; G. G. Edwards, Engr., Ennis, Tex.

Staunton, Va.—Augusta County Comms.; construct roads; voted \$250,000 bonds.

Beekley, W. Va.—Raleigh County Comms.; grade 4.6 mi. Surveyor-Eccles road; \$63,733.45; Higgins & Co., Contrs., Raleigh, W. Va.; H. R. Anderson, Road Engr., Beekley.

Beekley, W. Va.—Raleigh County Comms., Jackson Smith, Clk.; grade and drain 5 mi. road toward Artie; bids until July 12; H. R. Anderson, Road Engr.

Elkins, W. Va.—Randolph County Comms., Thaddeus Pritt, Clk.; construct 5 mi. Roaring Creek bond issue road; 16 ft. bituminous macadam pavement; bids until June 29; F. A. Parsons, County Road Engr.

Middlebourne, W. Va.—Tyler County Comms., J. E. Smith, Clk.; grade and drain 4 mi. Sistersville-Friendly road, 16 ft. wide; W. F. Allen, Contr., Clarksburg, W. Va.; rejected bids for hard-surfacing 1.2 mi. Salem road.

Wheeling, W. Va.—Putnam County Comms.; grade 2 mi. Red Souse-Poca road; 22,000 yds. excavation; \$25,000; bids until June 28.

Winfield, W. Va.—Putnam County Comms.; construct permanent roads; \$250,000 available; contract to Clifford Engineering Co., Montgomery, W. Va., and Huntington Engineering Co., Huntington, W. Va.

### Georgia's Heavy Roadwork Started.

Under the supervision of the Georgia State Highway Department, during the past year approximately \$2,000,000 has been spent for good roads work in this state, \$7,000,000 worth of work is now under way, and contracts have been awarded for other work that will start some time this year amounting to more than a million and a quarter dollars, according to the annual report of the State Highway Board that has just been issued by its chairman, C. M. Strahan.

In a letter to Governor Dorsey the chairman states that, according to a report of the Bureau of



Public Roads, Georgia ranks fourth in the nation in the progress made to avail itself of the Federal Aid funds. Virtually all of the Federal Aid projects delayed during the period of the war are now under way.

When the Georgia Legislature convenes, the latter part of this month, one of the important subjects that will engage its attention will be the completion of the program looking toward a thorough system of state highways. It is probable that a bill will be introduced to amend the state constitution in order to provide a bond issue to finance the highway work. The amount of this issue will probably be \$40,000,000 or \$50,000,000, and it will be decided upon at the polls by the voters.

Frank Reynolds, who has been lecturing for several months throughout the state in the interest of this issue, under the supervision of the state organization of county commissioners, declared that the state-wide sentiment favors it, and if brought before the voters the issue would carry by a big majority.

#### Protest Against Any Stoppage.

The New York Times of May 21 reported that the Association of Railway Executives intends to urge the Interstate Commerce Commission to refuse cars and transportation for road-building materials. The reason for this proposed action is given as to divert labor and materials to railroad needs.

For the past two or three years highway programs have been either suspended or seriously curtailed. Such discrimination as that proposed should not now be tolerated, particularly because of serious or impending food shortages and also because of the relief which highway transportation has been to industry in handling much traffic which the railroads could not take. Bad as the railroad situation is at the present time, it is almost certain to be worse later when still greater demands will be made for cars for crop movement. If highway construction can continue without undue obstacles, many of the roads now in process of construction will be finished in time to afford greater relief to the railways, and to meet other demands that undoubtedly will be made of them.

Under these conditions it would seem more necessary than ever to emphasize the imperative need of continuing essential road work with all vigor instead of in any way curtailing or handicapping it.

Everyone is interested in seeing our highway programs pushed to completion. Emphatic protest should be made to the Railway Executives' Association, 61 Broadway, New York, to the Interstate Commerce Commission, Washington, D. C., and to the President of the American Railway Association, Washington, D. C., against any further obstacles to highway construction.

#### Uses of Wet and Dry Sand in Concrete

The U. S. Bureau of Standards has been carrying out several series of tests of concrete made from Potomac River sand and gravel, using various proportions of cement to aggregate from 1:1½:3 to 1:3:6 and with the extremes of flowability used in practical concrete construction work. The tests are summarized in a Technical News Bulletin of the Bureau. When aggregates are proportioned by volume measure, as is customary on most construction work, it is found that the use of wet aggregates requires ½ to 1 bag more cement per cubic yard of concrete than do dry aggregates. Sand is generally or at least moist when used, so that the full difference may never be apparent in field practice; yet the use of sand from a pile which has just been exposed to rain will result in the employment of more cement for a given volume of concrete than would have been the case had the work been done on a dry day. The excess strength resulting from the increase in cement is unnecessary providing that designed strengths were obtained with the dryer materials. As above mentioned, this increased quantity of cement may be as high as one bag per cubic yard of concrete and the increase in strength due to the added cement in a cubic yard of concrete made with wet aggregates is roughly proportional to the increase in cement. Therefore, if there is a marked increase at any time in the moisture carried by the sand, the tendency on the job should be to use larger volumes of sand in the batch.

Marked improvements in the working qualities of the concrete will be noted under usual conditions when the relative volume of sand is increased and the gravel proportionately reduced. With well-graded river sand and gravel, such as is available in the District of Columbia, the "oversanding" may be beneficial up to the point where the volume of sand in the batch is equal to the volume of gravel. Such concrete will not segregate for maximum flowability commonly used in construction work; it will be easier working, the quantity of cement required per cubic yard will be slightly less and there will be no reduction in compressive strength.





# Safety Factors in the Use of Explosives in Cement Rock Quarrying

Continued from June—Part II.

IN the loading of holes particular watchfulness should be given to insure the complete absence of sparks or hot cinders from the steam shovel, from locomotives, or from the steam well-driller. Those who have watched a steam shovel at work at night will probably have a better appreciation of the menace that sparks represent, than those who have only seen the work going on by daylight, and it should be remembered that it is not only those sparks which are visibly red which are capable of igniting explosives, but that hot cinders which appear quite black may be at a sufficiently high temperature to bring about an ignition. I am inclined to believe that rather more accidents during loading are caused by hot cinders than are usually attributed to that cause, and the only safe practice is to keep all sources of sparks away from the vicinity of the holes during the time that loading is going on. Some quarries have small tents which are placed over the holes while they are being loaded, and while this is better than no protection whatever, yet it is not as satisfactory as the complete removal of sources of sparks during the time of loading.

Of course lighted pipes, cigarettes, or cigars should be rigidly excluded from the vicinity of loading operations. It is even best that men engaged in loading should have no matches in their possession, since a hole in a man's pocket or some other accidental condition hard to anticipate may lead to a match dropping down in the hole, or falling on the rock near the hole where it may be stepped on by the men loading the hole. Even gasoline engines are to be considered as a potential source of sparks. It is true that a gasoline engine only occasionally throws out sparks, but the carbon which accumulates on the piston head and at the end of the cylinder is ejected from time to time in glowing condition, and this, together with an occasional backfire makes a gasoline engine a possible source of accident if too near a hole during loading.

In loading the hole with explosive, it has been proposed from time to time to use holders or clamps of various sorts, in order to avoid dropping the explosive to the depth of the hole. These are not commonly used however, and experience seems to show that the hazard in dropping a cartridge of explosive through a hole 100 or even 150 feet deep, is very small indeed. The first cartridge would naturally seem to be the one most likely to explode if detonation from the shock of dropping were really a con-

siderable factor, since the later cartridge drops on the cushion formed by the cartridges already in the hole.

The experienced blaster is able to learn a good deal about the condition of the hole from the sound made by the first cartridge as it drops down, and the sound of the cartridge striking the bottom of the hole, or striking the surface of the water if the hole is wet, is used to determine the fact that the cartridge has gone completely to the bottom. It is excellent practice to "follow-up" the hole by measurements after each case of powder has been loaded, a case of powder ordinarily giving a "rise" of about 4 feet. There is always the chance of a cartridge "hanging" on the side of the holes, and thus leaving an air gap between the powder beneath which has been loaded properly and the point at which the first cartridge thus becomes crossed in the hole. If the "rise" in the hole is carefully followed by frequent measurements such a "block" in the hole will be promptly noticed, and the condition can be readily corrected, but if a considerable amount of powder is loaded over the crossed cartridge before it is discovered that a "choke" exists, the matter is naturally more difficult to correct. An experienced loader can usually tell from the sound made by each cartridge as it drops that it has landed properly on the powder already in the hole, but occasionally a cartridge will hang on the sides of the hole even with good loading practice. A single cartridge can be dislodged safely by careful use of a tamping stick, but if the "hanging" of the cartridge has not been noticed, and more powder has been loaded on top of this cartridge, so as to leave a column of two or three feet of powder above the choke, the dislodging of the material becomes more difficult. Efforts to dislodge such a choke by the vigorous use of the tamping bar are decidedly dangerous, and this procedure should never be followed. The best practice is of course to prevent any column of powder from building up on a "choke," by using the measuring line sufficiently frequently to keep in close touch with the level of the powder in the hole, and by paying proper attention to the sound made by the dropping cartridges as they land on the powder beneath. If a "choke" should occur however and more than a foot of powder should be built up over the crossed cartridge, the safest procedure is usually believed to be the cautious driving of a sharpened stick about 2 inches in diameter through the "choke," followed by the flushing out of the powder above the "choke"



by means of water. Unless a quite excessive amount of water is used, this procedure will not cause the loss of the hole, as the powder will detonate in spite of a rather considerable amount of water which may be present after this treatment.

The size of the cartridge used in loading the hole is not a matter of indifference. For the standard 5 $\frac{5}{8}$ -inch well-drill hole the 4 $\frac{1}{2}$ -inch by 10-inch cartridges are commonly used, unless the hole is quite rough and ragged, in which case 4-inch by 8 inch or 4-inch by 10-inch cartridges are used. Using cartridges which are too small is a disadvantage, because the proper density in the hole is then more difficult to attain, while using too large cartridges is a disadvantage, because the chance of such cartridges catching on side of the hole is materially increased. As a matter of fact the chance of a cartridge choking a hole is increased by the use of cartridges which are either too small or too large, and for well-drill holes the cartridge should preferably be one inch smaller than the diameter of the hole.

In measuring the hole a special tape gives the best results, although in many quarries the tamping stick rope is used instead. Whatever may be the method adopted to keep track of the height of the powder in the hole, the point which should be brought out is the desirability of the measurements being made so frequently as to enable the loader always to know the height of the powder in his hole.

The extent to which powder should be tamped during loading really depends upon the type of explosive which is being loaded, and therefore should more properly be considered in connection with a discussion of the selection of powder for various types of blasting. Tamping of the explosive during loading is quite desirable in the case of the more plastic nitroglycerin explosives, but increasing use is being made in cement rock quarrying of explosives which require little tamping, and indeed in many quarries the explosive is not tamped during the loading, the tamping bar being only used at the end of the loading operation in compacting the stemming in the hole.

If explosives are to be tamped, however, it is most important that too much force should not be used. A rather considerable number of accidents have been due to improper use of the tamping bar, and the use of unsuitable materials as tamping bars. It should be evident from what has already been said that the presence of any iron surfaces on the tamping bar is a potential source of danger, and that the use of too heavy a tamping bar also involves a rather heavy risk. I have sometimes been told that a heavy tamping bar has advantages when it is properly used, and there may be some truth in this, but the fact remains that when improperly used such a bar becomes a danger, and the chance of the bar being improperly used is always present. I have been told of one case in which a type of tamping bar which has

been for some years with perfect safety by a powder foreman was used in his absence by a less experienced man, and in the course of the loading operation a choke developed and an effort was made to drive it out with the tamping bar, and an accident resulted. A lighter tamping bar would have been safer in this case, just because of the possibility of the misuse of a heavier bar by an inexperienced or careless man.

I have seen some rather surprising tamping bars at various times, ranging all the way from solid iron bars to iron tipped wooden rods. Once, in investigating a "mysterious" accident which had occurred on a piece of railroad work on which a nitroglycerin explosive of low nitroglycerin content was being used, I found that although suitable wooden tamping bars were supplied to the powder men by the contractor, a powder foreman had shoes made of lengths of iron pipe fastened to the end of each of the bars, "to keep them from fraying out so quick," and naturally the inevitable happened, and several men lost their lives in the resulting explosion.

Even wooden tamping bars can be unsafe if too heavy or if carelessly handled. It is not infrequent for sharp pieces of rock to become imbedded in the bottom or sides of a wooden tamping bar, and no one needs to be told that such a tamping bar will strike a spark under favorable conditions by rubbing against the side of a rough hole. The tamping bar should not be too large, in order to avoid excessive friction against the side of a hole, this precaution being particularly important in connection with piston drill holes.

A suitable layer of powder should always overlie each priming cartridge containing a detonator. Detonators are always to be treated with great respect, and having two or three feet of powder above the detonator before allowing any tamping to be done is an excellent rule.

The energy that might otherwise be spent in tamping the powder can be utilized to advantage at the top of the hole in thoroughly tamping down the stemming which is applied over the powder. The first two or three feet of stemming should not be tamped, but after this the stemming can be tamped down quite hard, and indeed, if care is taken not to damage the line of cordeau or the electric wires, it may almost be said that the harder the tamping of the stemming material, the more efficient the shot will be. Experiments have demonstrated his point rather thoroughly, and a shot which is well confined does perceptibly more work per pound of powder used than can be obtained from a shot in which poorer confinement has been provided.

It is usually unnecessary for workmen to stand on the rock lying in front of the line of holes after the loading begins, and this is a safety precaution which may accordingly be given consideration. Should a premature explosion occur from any cause



during the loading operation, the chance of men being injured is naturally less if the workmen are on the far side of the line of holes, instead of between them, and the quarry face.

It is of course evident that the final connecting up of the electric detonator wires, or the cordeau connections, should not be made until shortly before the blast is ready to be fired. When electric detonators are used, the method of wiring or connecting up a shot is a matter to which thought should be given. Where only a few shots are to be fired the detonators are often arranged in series, and fired by a blasting machine of the usual type, but in quarries where a good deal of blasting is being done and where quite a number of holes are to be fired at one time, the parallel method of wiring is often preferred, the electric current being furnished from the power circuit. The connections should always be in parallel when current from a live wire is used in firing the blast.

As electric detonators are sensitive to relatively small circuits, and may be fired by "stray" currents the existence of which may not have previously been known, the wiring should always be in the hands of competent and trustworthy men, and the holes should not be connected up until the shot is practically ready to be fired. Several cases are known where electric detonators have exploded apparently without cause, and investigation has shown that the wires were abraded at certain points, so that direct contact was established with moist earth or with some conducting metal. In coal mining several accidents have occurred through stray currents from a passing electric locomotive finding passage through an abraded wire to a charge which was not yet ready to be fired, and at least one accident in a cement quarry has been found to be due to a quite similar cause. These accidents only emphasize the point already brought out, that the lead wires connecting up the separate holes should only be attached when the tamping of the holes has been completed, and when the blast is ready to be fired. In addition, the lead wires should always be kept in good condition, and should be taped if any abraded spots are found.

One of the points which is to be avoided in the connecting up of a blast is too great haste in making the electrical connections. Wires loosely twisted together do not form a good electrical connection, and more than one quarry superintendent has no doubt criticized his powder foreman and his blasting men for a poor blast that has in fact been due to the failure of some of the holes to be fired by the electric current, the detonation of these holes coming through the shock from adjacent holes, and too late to enable the explosive to do its proper share of work in the blast.

The lead wires should not be brought near the exploder wires while loading is going on, and all the connections of the blast should be completed before connecting to the lead wires. The custom of having shots connected up to the lead wires and firing battery before work around the holes has been completed is strongly to be condemned, and there is always the possibility that some one will unintentionally fire the blast under these conditions, in the effort to "test out" the battery or the connections without realizing that electric detonators are in the circuit. Probably the safest method that I have seen for preventing accidents from the unintentional applying of current before the blast is ready is the placing in the circuit of a special block, which leaves the circuit open unless a special form of key is placed in it. The key is retained by the man responsible for the blast until the time that the current is to be applied, and is then inserted. Where firing is done from a power circuit a modification of the same principle may be applied, or the switch connecting the lead wires may be locked in position in some suitable way. The one point which I consider quite important is that one man should be responsible for the circuit, and that this man alone should have the key controlling the switch or the safety block.

In firing with cordeau the electrical circuit should be made before the exploder is placed in the special union which connects the detonator with the main strand of cordeau. The manufacturers of cordeau provide special attachments which may be used either with electric detonators or with detonating caps, and in addition special tools are provided for slitting cordeau in the making of connections and joints.

The rules for safety and efficiency in the handling of explosives in connection with secondary blasting operations are of course not dissimilar from those rules which should be followed in primary blasting operations. In block-holing one pound of explosive will do fully the execution that ten pounds of the same explosive will even in a well placed "dobie," or mud cap shot, while a poorly placed mud cap shot is notoriously wasteful of explosive. It is frequently economical to use the larger quantity of explosive required by the mud cap shot, because of the cost of the drilling of the holes in the block-holing method. A few years ago the situation was much more difficult than it is at present, but recent improvements in light air hammers have materially cut down the cost of secondary drilling, so that the alert quarry superintendent will bear constantly in mind the advantages for and against the block-holing method. Where mud capping is done, it is well to remember that earth and clay are much cheaper than explosive, and that a somewhat larger pile of dirt will be equivalent to a noticeable amount of



explosive in the charge that is necessary to break the rock.

Proper protection for workmen in the quarry from fragments thrown by the blast should of course be provided. The usual cylindrical safety shanties of boiler plate provide rather satisfactory protection if located at a suitable distance, and if the doors or openings are turned away from the direction of the blast. In firing a large blast no one should be permitted to remain on the quarry floor in front of the blast even though the distance may seem safe, for small pieces of stone are frequently projected with exceptionally high velocity and are capable of causing serious or even fatal injuries at a distance considerably in excess of what would appear normally to be a safe distance.

I do not believe it is best to end this discussion of safety factors in connection with the handling of explosives, without calling to your attention the rather small percentage which accidents due directly or indirectly to explosives bear to all accidents which occur in connection with cement rock quarrying. Some years ago I had occasion to investigate and classify the accidents which occurred in coal mining over a period of years. I had read, as all of you have, of those terrible accidents due to the explosion of coal dust which at times sweeps through the entire extent of the mine. One such accident, at the Couriere mines in France, led to the loss of more than a thousand lives, while in our own country two such accidents led to the loss of 350 and 250 lives respectively. On taking up the matter of tabulating all accidents which had occurred in coal mines, however, and classifying them according to their cause, I was rather surprised to find that accidents due to explosives and explosions together were really rather a small fraction of the total number of accidents which occurred. The Bureau of Mines has recently reported there was a total of 2,579 fatalities in connection with coal mining in this country, and of this total 135 deaths were due to explosives, and 129 deaths were due to gas of coal-dust explosions. Accordingly only about one-tenth of all fatalities were due to either explosives or explosions, and only about one-twentieth of all the fatalities which occurred were directly due to accidents from explosives.

Government statistics in connection with quarry accidents show rather similar results. In Tech. Paper 165 of the U. S. Bureau of Mines accidents classified by cause are shown for the year 1915, and of 149 fatalities in quarries or at rock dressing plants and mills the number killed by explosives was but 28, this figure including not only all fatalities due directly to explosives, but also all fatalities due to flying pieces from blasts and other indirect causes.

Mr. Jackson has very kindly given me figures in

regard to accidents from explosives reported to him during the year 1918 by members of your association, and from these figures I note that all fatal accidents of which he has record which occurred during the year 1918 somewhat less than 8 per cent were due to explosives, and somewhat more than 92 per cent were due to other causes than explosives. Of all accidents, including fatal and non-fatal accidents, those due to explosives constituted somewhat less than 2 per cent of the total and those due to other causes than explosives constituted more than 98 per cent of the total.

This is a rather satisfactory record, and shows quite clearly that explosives, far from being one of the most dangerous factors that you have to contend with, are really less dangerous than many other factors to which much less attention is usually given. Falls and slides of rock cause many more fatalities than do explosives, both in coal mining and in rock quarrying.

The ratio which the number of fatalities due to explosives bears to the number of fatalities from all causes is considerably higher in quarrying operations than in either coal mining or in metal mining. It is interesting to note however, that the number of accidents due to explosives in the quarries of the members of your association, compared to the number of accidents from all causes, represents a materially lower rate than that which exists in the quarry industry as a whole. The last available figures from the Bureau of Mines show that 19 per cent of all fatalities in and around quarries and including crushers, rock dressing plants and mills were due to explosives, while the figures which Mr. Jacobsen has collected covering the operations of the members of your association show that the percentage of fatal accidents due to explosives was only 7.9 per cent of all fatalities, or less than half of the ratio which exists when all quarrying operations of the U. S. are considered.

It should be our aim to improve still further the good record from a safety standpoint which explosives now have in quarrying operations, and I feel sure that this result will be obtained by that spirit of co-operation and mutual helpfulness for which your association so truly stands.





# Cement Discounts and Uniform Prices

THE Southeastern Builders Supply Association, recently organized by building material distributors of Alabama, Florida, Georgia, Louisiana, Mississippi, North Carolina, South Carolina and Tennessee, has taken up with the Portland cement manufacturers two questions of much practical interest to dealers in builders' supplies.

The following correspondence is self-explanatory:

Atlanta, Ga., April 1, 1920.

To the Manufacturers of Portland Cement in the United States of America.

Gentlemen:

The Southeastern Builders Supply Association was recently organized. It represents dealers in building materials in the States of North and South Carolina, Georgia, Florida, Tennessee, Alabama, Mississippi and Louisiana. At a meeting recently held in this City, two resolutions were passed relating to conditions in the Cement Industry. I was instructed to send a copy of same to every Cement Manufacturer in the Country.

This is being done, and we seek your careful consideration of same.

In the proper distribution of cement,—our interests are identical. Better conditions for us, means better Dealers for you. What we are asking for puts no hardship or unfair treatment on the public. It simply means, the correction of some things that need it, for the betterment of the business generally. I will appreciate very much indeed, if you will indicate in an early reply, your position on these two resolutions.

Yours respectfully,

V. H. KRIEGSHABER,

President.

## Higher Cash Discount Requested.

Atlanta, Ga., April, 1920.

Resolutions adopted by the Southeastern Builders Supply Association:

Be it resolved,—that the Manufacturers of Portland Cement, in the United States of America be and are hereby requested to allow a discount for cash payment, of ten cents per barrel ten days from date of shipment, instead of five cents which is now the prevailing discount.

## ARGUMENT.

When the present five cent, cash discount condition was applied to Cement settlements, the mill price on cement averaged from a dollar to a dollar and a quarter on cement, and bags were charged at ten cents each. Five cents discount represented

at that time, more than the usual two per cent discount given on other materials. Contractors, and other carload buyers of cement, eagerly availed themselves of this discount, and of course most of the Dealers did the same thing. At the present high cost of cement and bags, this five cents discount represents less than two per cent, and while the Dealers are still discounting almost one hundred per cent—this is not the case with the consumers.

It is to the interest of the mills, and of the trade generally to get the car load cement business on a ten day cash basis, as rapidly as possible. If our customers pay promptly, it enables us to do the same thing, and it is to our MUTUAL interest, that this be encouraged to the fullest extent. A ten cent per barrel cash discount should represent at the present time, more than 2 per cent ten days, and to that extent encourage and create a large number of prompt pay customers,—which after all is the sole purpose of this recommendation.

## Uniform Price for Sacks is Urged.

Atlanta, Ga., April, 1920.

Resolutions adopted by the Southeastern Builders Supply Association:

Be it resolved,—that the Manufacturers of Portland Cement, United States of America, be and are hereby requested to adopt a uniform price to be charged for cement sacks.

## ARGUMENT.

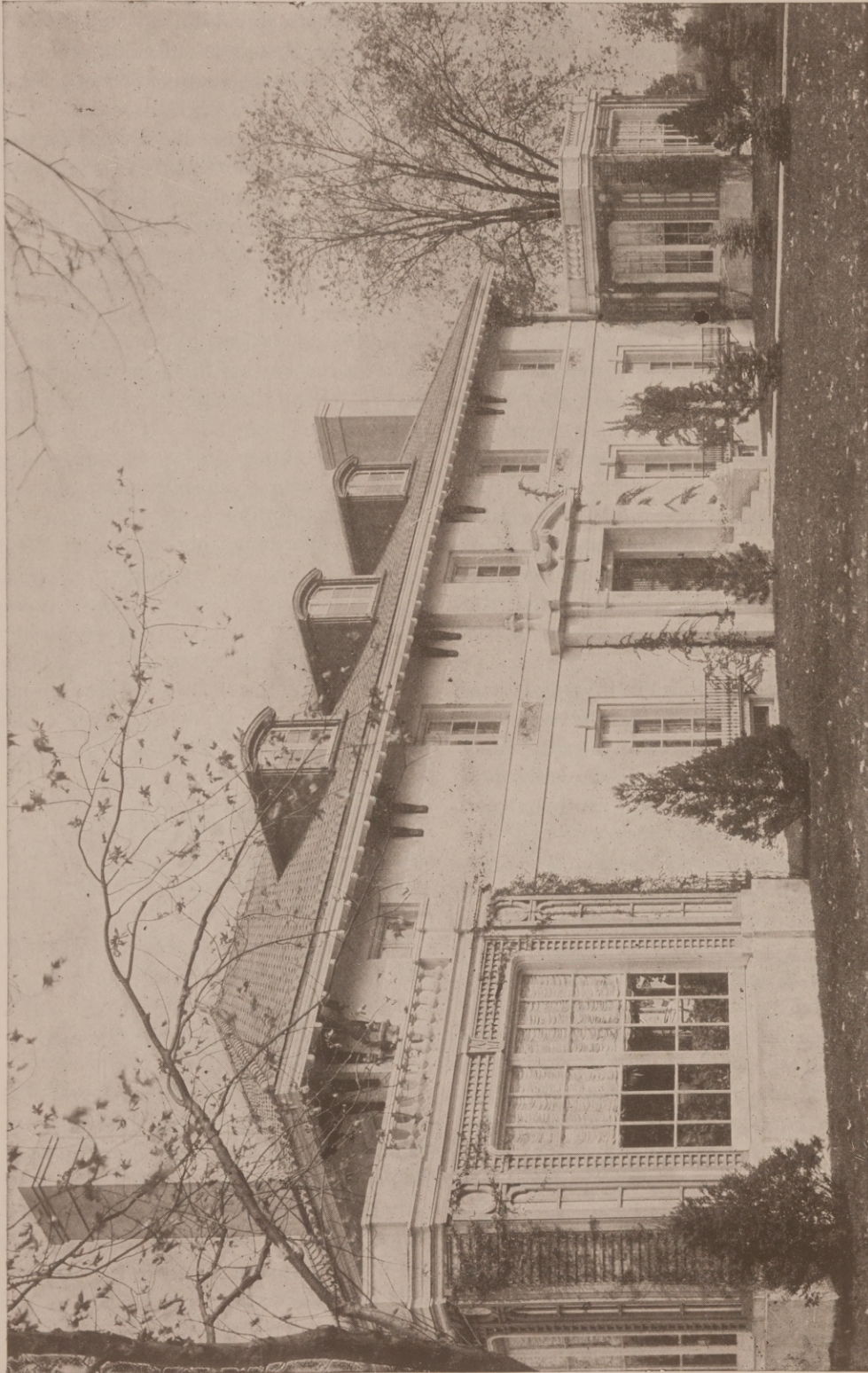
The extreme shortage of cement, has created an abnormal condition of supply and demand. Cement shortage in many sections of the country, has induced the shipment of this material into territory, hitherto not reached by many Manufacturers. Some mills with a large supply of old bags, purchased when cotton was low, are charging 15c each for the bags. Other mills, not so favorably situated, are charging 25c each. At the present price of cotton we are told that new bags are costing over 30c each. While it is true that the mills rebate the good bags returned, at original invoice cost, and therefore have but one bag price to contend with, at the same time, in some sections of the country,—and notably with us in the Southeast,—there are mills shipping in 25c, and some in 15c bags. At best, the bag proposition is a troublesome one to the Dealer, and with bags charged at different prices, and cement coming from where ever obtainable, it is causing a good deal of trouble and confusion in the trade generally.

It is not our purpose to tell the manufacturer



what he shall charge for the bags; if he choose to charge them at half their present cost, that is his prerogative, but we do feel that the interest of the Dealer would be prescribed, if some uniform price was charged throughout the country, and our suggestion is that it be placed at such a figure that

will avoid frequent changes. Our experience proves, that when the price of bags represents more nearly the present cost of same that the diversion for other purposes and the sale in small lots to junk dealers, stop, and they come back to us, in larger numbers.



Stucco Residence of Mr. Gage E. Tarbell, at Garden City, L. I.; Oswell C. Herring, Architect.



# As Natural as Nature Itself

CITIES without natural outcrops of rock in their parks may have "something just as good." Imitation rock-work molded in concrete has now reached such a stage of perfection that it is positively indistinguishable from the reality. One of the latest masterpieces, a forty-foot cascade in Glenwood Park, Minneapolis, is said to be the most extensive work of the kind yet produced; and we are assured by Hjalmer Lindquist, who writes of it in *Concrete* (Detroit), that it would "baffle the understanding of the most skeptical." Explanation to admiring bystanders that the cascade is artificial invariably provokes ridicule, we are told. The cascade pours twenty thousand gallons of water per hour over its concrete precipice. It was given to Minneapolis by C. M. Loring, and was designed and built by F. Scotti. It goes by the name of the Loring Cascade. Says Mr. Lindquist:

"The water is pumped through a five-inch pipe to the summit of the hill, then divided into three separate streams. The largest of these feeds the main cataract at the top, while one smaller stream feeds a branch creek that circles into the other midway between the hilltop and the top of the big falls. The last stream trickles over a small cascade of its own in a cave just beside the main falls and the large pool. It returns with the others to the lake, after running its course through a pipe at the end of the lower creek.

"The spot on which this fountain stands was chosen by Mr. Scotti because of the high hill on which to rest his work, the gradual incline of the road along the side of the hill, which made the lower creek possible, the lake close by to supply water; and the good road leading by it that permits observation of the work by tourists and other sightseers. The construction of the cascade began at the end of the lower creek and progressed from there to the top of the hill.

"The creek has a concrete bottom four inches thick and varies from two to six feet in width. The large pool into which the big fall empties has bottom and sides of reinforced concrete eight inches thick on the bottom, and the front slightly more. The two sides and back are bounded and held by a circular retaining wall of concrete, well reinforced. \* \* \*

"The wall, with its abutments, was made in the usual way, by depositing concrete between plank forms. None of this concrete work is now in evidence. It has all been completely concealed and its lines broken by well-planned rock formation.

"It was necessary to build a scaffold for the men while working on each of these boulders. The wire basket was propped up from below while it was being plastered. They were also braced on the inside in

the same way to keep the top from sagging. The inside of these rocks received a thick coat of mortar to make them stiff and strong.

"The flat wall-pieces left between these boulders were simply plastered over at some places and details worked into it as in the rocks, but at others natural boulders were piled up on top of the artificial; to break lines, these were of course coated with mortar.

"The wire-mesh rocks overhanging the large pool are hung on the wall, as explained. There are also a few solid overhangs built up from the floor of this pool. Several others of this variety adorn the lower creek."

The overhanging part of these rocks, we are told, was built on platforms of boards, covered with canvas or sacks; spread with mortar and the rocks stuck in. It was then built up with layers of mortar and rocks to the desired height, size, and shape—large rocks in the bottom filled in with smaller ones near the top. Sometimes a rock is stuck under the canvas to break the edge line. If the overhang anywhere exceeded eighteen inches it was reinforced. The rocks were also given sufficient counterweight to prevent their toppling over. The writer goes on:

"The overhangs higher up on the bank of the lower creek and the few near the top of the hill are of wire netting. These rest on the rocks beneath them and have their top edge secured to rods held in concrete well anchored into the hillside. A framework of rods formed into the desired shape, secured to the bank above and to its base beneath, covered with wire mesh and coated with mortar, explains the construction in a general way.

"There are three balanced rocks—one on each side overhanging the top of the big falls, and a third standing guard over the mouth of the lower creek. This last rock has a foundation built of natural boulders. \* \* \*

"The balanced rocks above are stuck to the wall and to an extended base of boulders on the outside, and reinforced in the same way. All have a thick, strong bottom and are well fastened to their bases. \* \* \*

"The wire-mesh rocks all have small drains cut through the bottom of their low end to prevent water from gathering and bursting the rock in freezing weather.

"Many of the rocks also have pockets to carry plants and shrubs. These pockets were built into the boulder rock, formed in the mesh rocks by bent rods fastened to the top and sides or sometimes from the top to the bottom, covered with wire and mortar.

"The pockets have drain-holes emptying into the other parts of the rock, then out, through its drain.

"Behind the big falls and each little cascade there



is always a pool to gather and quiet the water before it is pushed over a leveled line to make it drop. The water is thus distributed equally over the breadth of the creek and falls. Water tumbling over a cascade always falls into a pool waiting to receive it. This is nature's way, and it must therefore be the artist's way when he imitates nature. Water falling into a pool does not splash as it would if falling on a hard rock surface. These pools are made merely by damming up the creek. One boulder blocks the passage of the lower creek over which the water must flow; this permits water to gather a little more than a foot deep in the large pool. The upper pools are likewise formed by obstructing boulders. The difference is only in size and design detail.

"A row of small rocks (built up of boulders) was lately added along the edge of the road across from the cascade. It is not connected with the cascade; it stands out distinct and alone.

"The effect aimed at here was to give the road the appearance of having been cut through a solid mass of rocks. Drill-holes have been imitated on the side facing the road to indicate or suggest how this work was done."

#### More Asbestos Being Used.

Asbestos building products are now in great demand. Fireproof qualities naturally associated with the name are not the only reasons for this. The practice of rushing up temporary structures has been stopped. More thought is now given to permanency. Not only fire hazards but also deterioration and value depreciation are now being given much more consideration.

C. S. Berry, Atlanta, Ga., manager of Keasby and Mattison Company, has returned from a two weeks' trip to their factory at Ambler, Pa., and to the New York office. He states that their records show that the South is making the greatest percentage gain in commercial and industrial building. The territory served by the Atlanta Branch, of which Mr. Berry is manager, has been enlarged until it now includes seven States. His present sales force is also being greatly increased.

Traffic is so congested as a result of the recent strike on top of the already poor transportation service that all building materials are becoming short and this is slowing up building operations. Mr. Berry states that railroad troubles did not bother him on his return trip as he got a chance to ride back in an automobile. The trip was made without trouble and the roads were good.

#### Safety Measures in Operation of Gyratory Crushers.

Easily applicable safety measures for gyratory crushers are outlined in the March-April Accident Prevention Bulletin of the Portland Cement Association, from which the notes following are taken:

When working near a crusher men should wear safety belts attached to ropes, and it goes without saying that it is the company's duty to furnish this equipment and see that it is used. Often men do not use the safety appliances furnished them because the danger involved has not been put before them in the right light. Possibly they do not see the danger, because they have done the same work for years without mishap. Again their superiors may not have made any attempt to enforce the rules which they have once issued.

A recent report received by the Bureau of Accident Prevention and Insurance told of a man who, while working at a gyratory crusher as hookman, was taken severely ill with vertigo. Fortunately the report records merely a case of sickness, but how little would have been required to make this one of the many unexplainable fatal accidents. It is commonly known that a person threatened by an attack of vertigo feels as if surrounding objects were whirled around or as if he himself has been whirled around. There is a strong tendency to fall. If the man in the case referred to had lost his balance and had fallen into the crusher a fatal accident would have resulted. Did the man wear a safety belt? Very likely not, at least the report does not mention it.

Another recent report tells of a man who, while punching rock into a crusher with a bar had the bar caught in the crusher and was hit on the head by it as it swung around. The only result in this case was that his right ear was bruised. Had the blow been severe enough to stun him a fatal accident would have been the result. Did this man wear a safety belt? The report did not say.

In neither of these accidents was any time lost, but if these two companies had followed the method of some of not reporting "trivial things," nothing would have been known of the danger to which two men were exposed. The object of reporting is as much to expose unsuspected dangers as to compile statistics on time lost. When we know the dangers we can guard against them by taking necessary precautions before accidents occur.

Some very severe accidents have occurred at crushers. The superintendent at one plant has no trouble in getting the men to use the belts. It is an absolute rule at this plant that if the crusher men wish to keep their jobs belts must be used. Do not satisfy yourself with the idea that your "conditions are so different." A gyratory crusher, no matter where it is, must be given attention when it refuses to take hold of rock fed into it and the only way this attention should be given is the safe way—with the use of a safety belt and railing. Your men should know this, and it is up to you to bring it to their attention. Do it now before another case of vertigo or tripping on a stone or being hit by a bar sends a man into the jaws of almost certain death.



# Pretty Example for Concrete Residence



---

## Georgia's New Contract for Road Work

NO state highway engineer or other official who knows his business has any desire to see a contractor fall down on a road job. That only means trouble for everyone concerned; trouble for the contractor, trouble for the county in which the road is being built, trouble for the state department which is supervising it, grief all along the line, and plenty of it, too. But the history of road building, in the last few years, especially, is filled with the names of contractors who have lost money in road work. Often the failure has been due to causes which were almost beyond the contractor's control. Usually long spells of bad weather, unlooked-for scarcity of material or the cars in which to move it, a thousand and one reasons which are next to impossible to anticipate, may turn a profit into a loss.

Under the usual system of competitive bidding,

the contractor has to take chances on these things. He has to name his total price in advance and stick to it, whether he wins or loses. Many a time it is nothing but a gambler's chance that he takes.

In an effort to protect the contractor, to get the work of road building closer to ordinary business methods, the Highway Department, State of Georgia, is working out a new form of contract, known officially as Form B. If it meets with the approval of all parties concerned it will be used this season and its workings will be closely observed.

Briefly stated, the contract provides for payment to the contractor on a basis of unit costs estimated by him in his bid to which he adds the amount which he expects to make as his profit. If the total cost mated, the contractor will receive 25 per cent of the of the work as constructed is less than the sum esti-



difference between the actual cost and the estimated cost, such payment, however, not to exceed 50 per cent of the sum originally estimated as his profit.

On the other hand—and here is the feature which protects the contractor—if the actual cost exceeds the estimated cost, 25 per cent of such excess cost shall be deducted from the sum originally estimated as profit, but this 25 per cent shall not exceed 50 per cent of the contractor's estimated profit. He still has half of his profit in any case.

The following examples show how the new system will work for certain sums:

If a contractor's estimate for the actual cost of the work were \$100,000 and his fee were \$10,000 and the actual cost of the work were the same as the estimated cost, he would get his \$10,000. But if the actual cost were \$110,000 his fee would automatically be reduced to \$7,500. If the actual cost should prove to be \$120,000, his fee would be cut in half to \$5,000. If the actual cost mounted to \$130,000, the provision of the contract which provides that the contractor's fee shall not be reduced more than 50 per cent would prevent any further reduction in the fee and the contractor still would receive \$5,000. The cost to the owner in this case would be \$135,000.

Now take the case where a contractor completed the work for less than the estimated cost. Take the same contract, \$100,000 estimate plus the \$10,000 fee. If the actual cost were only \$90,000, the contractor would receive \$12,500 as his fee. If the actual cost were as low as \$80,000 he would receive \$15,000 as his fee. The same fee would hold good if the cost were reduced as far as \$70,000.

To arrange all this is by no means as simple as it seems. In Georgia the counties are the actual road builders, rather than the state, the State Highway Department's function being largely of a supervisory character. This makes it necessary for the contractor, the State Highway Department and the county to participate in the proceedings, so the contract has to be what the lawyers call a tripartite agreement.

In the language of the contract, the county is called the "owner," the State Highway Department acts as the owner's agent in supervising the work, and the contractor acts as the owner's agent in executing it.

With these relationships established the contract then states that the owner (the county), will pay to the contractor a certain sum as compensation or fee for the services rendered by the contractor whereby the county receives the benefit of the contractor's business system, purchasing facilities, engineering skill and experience, ability to equip, to organize with skilled foremen and laborers and includes the use of the contractor's equipment, tools, etc. A list of the equipment which he intends to use is attached to his bid by the contractor.

Then the contractor figures out his unit cost on

all of the items entering into the job, such as clearing, earth excavating, concrete work, etc., etc. These various unit costs are lumped and the total is called the cost of the work. That is the figure the contractor tries to beat in order to get his extra compensation, knowing, however, that if he exceeds it he will lose at worst only half of the amount previously named as his profit.

"At worst," is not quite correct in the last sentence of the preceding paragraph. There is a condition under the contract where the contractor can be in a worse fix than losing his profits. That is where he so mismanages the work, that in order to protect the county, the State Highway Department is forced to step in and take over the job. As it is worded this provision of the contract seems to give the State Highway Department almost arbitrary power, but there seems to be no other way to protect the public, for whom all three parties to the contract are really working. If the State Highway Department conducts itself fairly and squarely, no fair and square contractor will suffer. And if the department is not fair and square, the sooner that fact is discovered the better for all concerned. This clause of the contract will prove that point one way or the other.

Payment is made by the county as the work progresses on monthly statements of items included in the cost of the work, duly approved by the State Highway Department. If, as the job goes on, it becomes evident that changes in the specifications are necessary or decreased or increased quantities of work must be handled such changes, when approved by the State Highway Department, shall not count against the contractor when the actual cost is figured. The usual clauses in regard to liability insurance, etc., are included.

That is how the contract reads. How is it to work? There are three factors that must be considered in awarding jobs under it.

The total amount of the bid, which will be the estimated cost plus the estimated profit, or "contractor's fee," as it is called in the contract, is the first factor. Of a total of 100 points, this item of total cost should be figured as about 65.

Then comes the experience of the contractor, his financial backing, his record on other jobs, all of which he is required to set down in a schedule which is attached to the contract. The total of these items should count about 20 points.

That leaves the question of his equipment to count the remaining 15 points. His statement is checked and the efficiency of his equipment on the job he is bidding on estimated. Big and unsuitable equipment for a small job will count no more than too small a plant for a big one. The contractor will find



that he will have to confine his bidding to jobs which he is properly equipped to handle.

Price, 5 per cent; experience and financial backing, 20 per cent; equipment, 15 per cent, is a fair approximation of the values which the State Highway Department will put on these three factors in awarding jobs.

No one expects this contract to work perfectly in every case. No man-made plan ever did that, and none ever will. But it will protect the efficient contractor with a good record behind him, and a good plant with which to build roads. These are the men whom Georgia wants to build her roads, and when she gets them working for her and with her, she wants to protect them. That is what Form B is for.

### Foreign Trade Opportunities.

Where addresses are omitted they may be obtained from the Bureau of Foreign and Domestic Commerce, Washington, D. C., and at the branch offices of the Bureau, 315 Custom House, New York, N. Y.; 629 Federal Building, Chicago, Ill., and Association of Commerce Building, Chicago, Ill., and Association of Commerce Building, New Orleans, La., and 310 Custom House, San Francisco, Cal. For convenience in filing please use separate letter sheet for each trade opportunity request.

33088.—A partner in a firm in the French West Indies is in the United States and desires to secure an agency for the sale of cement and machinery. Reference.

## Organization the Keynote in Concrete Paving Contract in Spalding County, Ga.

By H. A. Lorick, Assistant General Manager, McDougald Construction Co., Atlanta.

**F**ORESIGHT and co-ordination of methods and equipment are the dominant features in the concrete paving contract on the Dixie Highway in Spalding county, Ga. Three separate sections, all on the same road, and executed by one contractor have made it possible to dovetail operations and to use equipment in the most efficient manner.

The work now under way includes Federal Aid Project No. 1-A, about 6½ miles of concrete paving from the north line of the county to the north end of a short stretch of concrete road built a few years ago. Other contracts under way are a 7/8-mile strip of concrete inside the city limits of Griffin, and Federal Aid Project No. 1-F, from the south county line to within a mile of the city limits.

Federal Aid Project No. 1-A, north of Griffin, was started in July, 1919, and in spite of adverse weather conditions and other setbacks, steady progress has been made. Aggregates to be used on this project and the short stretch inside the city limits were unloaded and stored at Experiment and Sunnyside. As fast as aggregates could be received, they were unloaded by locomotive crane and stored in large piles between the track and the road. Every car of sand, stone and cement was unloaded promptly, with the result that long before the contract was completed the required material was on hand.

Aggregates were hauled to the mixer with 3½-ton motor trucks, loaded at the stock piles by loco-

motive crane. Storage piles were so spaced along the work that the average haul on the entire job was kept at about 1½ miles.

Sand and stone were dumped on opposite sides of the subgrade between the side forms, and were loaded into the mixer with a mechanical loader. The distance between the forms being 18 feet, the space between the two parallel piles of aggregates was too narrow to operate the loader efficiently. Later supplies of aggregates were piled along one side of the subgrade, alternating one load of sand with two loads of stone. Care was exercised to distribute the material so that just enough sand and stone was at hand.

While concrete was being placed on the north section, preparations were made to start work on the new contract south of the city. Aggregates for the north mile of this project were supplied from the stock pile at Experiment, the remainder of the work being supplied from a new aggregate pile at Orchard Hill. Material was mobilized at Orchard Hill long before the mixing plant on the north section was released, the locomotive crane formerly used at Sunnyside being moved to this location. Pipe lines and pumps were set up on the south contract at the same time, and as the haul on the north project became shorter, motor trucks were diverted to the new project and aggregates distributed on the subgrade. When the mixing plant used north of the city was



released, everything was in readiness for a prompt and effective start on the south contract.

The Dixie Highway through Spalding County is being built 18 feet wide, 8 inches thick at the center and 6 inches at the sides. A 1:2:3 mix is being used. A finishing machine is followed by a roller and belt. Aggregates are crushed limestone and washed river sand.

Funds were provided by a \$750,000 bond issue, voted in the spring of 1919. One-half of the cost of both projects will be paid for with Federal Aid funds.

Relocation of parts of the old road eliminated 10 main-line railway grade crossings and reduced grades and curves. When the work now under way is completed, the Dixie Highway in Spalding county will be paved from the north to the south county lines with the exception of one mile, which is not yet under contract, but which will undoubtedly be awarded soon.

#### Iron Pipe Railings.

Being the only company in the United States dealing exclusively in iron pipe railing, the Pipe Railing Construction Co., Long Island, N. Y., have among their customers some of the largest railroads, bridge builders and general contractors who give endorsement that the railing manufactured by that company is the strongest, and when the erection is considered, the cheapest railing post on the market today.

These railing posts are built to stand the test and have many good features, having been adopted by the Manhattan Railway of New York City. Give them an opportunity to demonstrate their product to your entire satisfaction.

#### McCants Organizes Big Company.

On June 1st, the Standard Fuel & Material Company, recently organized with Messrs. C. G. Ker-shaw, President; J. I. McCants, Vice President; W. D. Lewis, Jr., Secretary and Sales Manager; W. H. Brooks, Treasurer, started out actively in the fuel and building material business. It shall be the purpose of this new company to reach out into the Southern States as fast as possible with a complete line of building supplies and also coal for industrial and domestic use.

Mr. J. I. McCants and Mr. W. D. Lewis, Jr., need no introduction in building circles as each of these gentlemen have been intimately identified with the building industry for a number of years. Mr. McCants will be remembered with the Standard Portland Cement Company, with whom he was associated

## Speaking of CONCRETE GARAGES

Are you building them? Every car owner needs a garage that will protect his car from weather and fire, one that will be reasonable in cost and require practically no repairs—a concrete garage.

There are several ways you can use concrete to build a maintenance-free, permanent garage.

Our booklet "Concrete Block Garages" will show you one way. Write for a free copy.

#### PORTLAND CEMENT ASSOCIATION

Atlanta  
Chicago  
Dallas  
Denver  
Des Moines  
Detroit  
Helena

Indianapolis  
Kansas City  
Los Angeles  
Milwaukee  
Minneapolis  
New York  
Parkersburg

Pittsburgh  
Portland, Oreg.  
Salt Lake City  
San Francisco  
Seattle  
St. Louis  
Washington



in the capacity of Manager of Sales and Traffic for a number of years, in fact he was connected with the Standard Portland Cement Company from its very inception until it was taken over by the Atlas Portland Cement Company of New York, and Mr. Lewis will also be remembered by his many friends as having been with the Standard Portland Cement Company for whom he served in the capacity of Assistant Sales and Traffic Manager for something over ten years.

Several months after the Standard Portland Cement Company sold out these gentlemen decided to capitalize their wide experience and identity throughout the building circles in the South, which is responsible for the opening of the Standard Fuel & Material Company with every promise of making a tremendous success.

Messrs. McCants and Lewis are widely known among dealers, contractors, architects and engineers throughout the entire South and have a host of friends who will be pleased to learn of their new venture.

Under the management of these two gentlemen the Standard Portland Cement Company flourished in a manner that has made the company a wonder in the cement industry as it earned a larger return on the original investment than possibly any other cement company in America. The Standard Fuel & Material Company would be glad to communicate with manufacturers and shippers of building supplies for southern territory representation.

### Make Your Own Well Tiling

In the Piedmont section of the South it often happens that the common way of building a wall for a well with rocks does not hold, with the result that many wells cave in during a period of much rain. In order to guard against such an occurrence, many farmers in our section are making their own well tiling from sand, stone, and cement.

A form is purchased from some local carpenter, the usual size being 3 feet long by 2 feet in diameter, and the work of filling the form is then done during spare hours.

The molds used are patented molds, but are made by local carpenters according to the size wanted. The distance between the larger outer form and the smaller inner form is 3 inches, which is filled with concrete. The concrete is allowed to set firmly for a day before removing the forms. The outer form has hinges where the halves of the form meet, and is so arranged that this form opens outwardly so as not to disturb the concrete. The inner form has hinges at two different places, so as to fold inward sufficiently that the concrete is not disturbed when removing the form.

The mixture for the tiling is made of one part cement, two parts clean sand, and three parts broken stone, using a sack of cement to the joint of tiling. Using one's labor in spare hours is a big saving over the cost of such a large joint of clay tiling, which costs \$3.50 in our section. Each joint of tiling has a collar at one end to receive the next joint and make a perfect fit.

Such a section of concrete tiling is heavier than

### MR. CONTRACTOR!

With our experience we here present just what you have been looking for. That a mortar box built of No. 16 galvanized steel and angle bound, heavy angles, in two sizes 8 and 9 feet long. They are perfectly smooth inside and water-tight. We manufacture WALL TIES in large quantities and can quote attractive prices. Let us have your inquiries. Ask for Bulletin 100 R. It tells all about them.

**EMPIRE METAL TANK WORKS, THE QUICK SHIPPERS EAST ROCHESTER, N. Y.**

CONCRETE ————— FOR ————— PERMANENCE

## GIANT PORTLAND CEMENT

wants energetic, wide-awake dealers. Drop us a card and we will tell you all about our Cement.



### GIANT PORTLAND CEMENT CO.

603-610 Pennsylvania Bldg.,  
PHILADELPHIA

30 Church Street,  
NEW YORK

101 Milk Street,  
BOSTON

Works at Egypt and Lesley, Pa., and Norfolk, Va.



a similar one of clay, and is let down into the well by means of a chain and windless.

When such concrete tiling are once placed in position you have an excellent wall for your well, one that will last for generations, and it will never cave in during a rainy spell. It is also large enough to allow a person to enter and clean out the well.

**Permits Use of Hydrated Lime in Concrete.**

The New York Board of Standards and Appeals at a recent meeting took action permitting the use of a limited quantity of hydrated lime in concrete entering into building construction.

The rule as adopted reads as follows:

The use of hydrated lime in all classes of concrete construction shall not be prohibited when used in accordance with the conditions hereinafter set forth.

The hydrated lime shall conform with the standard specifications for this material which have been adopted by the American Society for Testing Materials.

The maximum amount of hydrated lime which

may be used shall conform with the following table, all weights given being the amount of lime which may be incorporated for each ninety-five pound bag of Portland cement.

1-1½-3 Mix, 4 pounds of hydrated lime per bag of cement.

1-2-4 Mix, 5 pounds of hydrated lime per bag of cement.

1-2½-5 Mix, 6 pounds of hydrated lime per bag of cement.

For hand mixed concrete, the hydrated lime and Portland cement shall be well mixed while dry.

Hydrated lime shall not be used in concrete which is to be deposited under water.

**SNEAD ARCHITECTURAL IRON WORKS**

**LOUISVILLE, KY.**

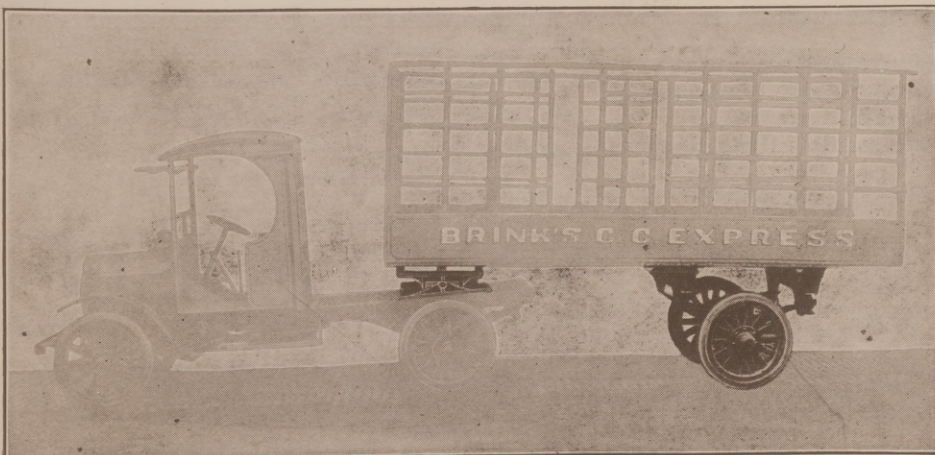
Structural Steel and Ornamental Iron. Large Stock of Standard and Bethlehem Shapes.

Immediate Shipments Plain or Fabricated Materials.

**MARTIN SEMI-TRAILER METHOD OF HAULING**



A well-built motor truck can easily PULL from two to three times the weight it can CARRY. Therefore a one-ton truck can easily pull a two or three-ton load; a two-ton truck a four or six-ton load, etc. The Martin Semi-trailer method of hauling enables motor truck owners to utilize the entire tractive power of a motor truck, much of which is ordinarily wasted.



SEND FOR 32 PAGE CATALOG GIVING FULL DETAILS.

ROCKING FIFTH WHEELS

FLOATING BEARING AXLES

CASTOR JACKS

REAR END

ASSEMBLIES

SEMI-TRAILERS

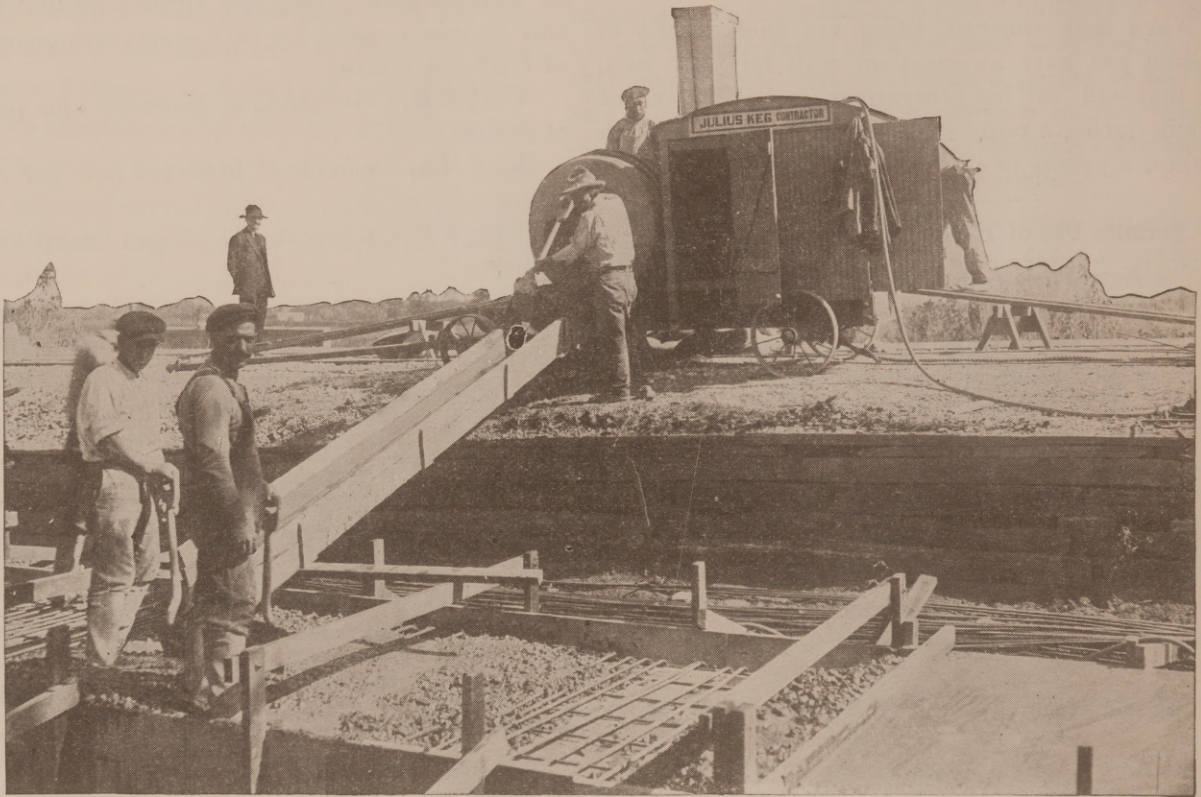
SEMI-TRAILER

PARTS

*Note that the Martin Fifth Wheel and Rear End Assembly together constitute a chassis.*

**MARTIN ROCKING FIFTH WHEEL COMPANY**  
 SPRINGFIELD MASSACHUSETTS





## The Standard Concrete Mixer Places More Yards of Concrete per Day

**T**HE quantity of concrete placed per day depends upon the speed of the mixer. No crew can make a showing with inefficient, time-wasting equipment.

"The Standard" will thoroughly mix more concrete per day than any mixer of its size on the market. We make this statement knowing it will be supported by contractors who use "The Standard." If you don't believe it possible try it on your next job.

The reason for the high mixing capacity of "The Standard" lies in the design and construction of the mixer. The simple drum with only lifting pockets,

tumbles the contents six or seven times in a single revolution.

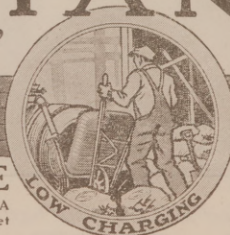
Then there is the quick discharge time, 15 to 20 seconds, and the low-charging feature, to further clip time and costs for you.

If you want to place more yards per day, get "The Standard." At least, look into this new 1919 model and see its improvements for yourself. Branch offices nearby to serve you satisfactorily.

Ask for Catalog No. 21

# "THE STANDARD" CONTRACTORS' EQUIPMENT

THE STANDARD SCALE  
PITTSBURGH NEW YORK PHILADELPHIA  
1631 Liberty Avenue 145 Chambers St 523 Arch Street



& SUPPLY COMPANY  
BALTIMORE CHICAGO CLEVELAND  
409 N Gay St. 163 North May St. 1547 Columbus Rd.



## Hotchkiss Steel Forms

Use modern methods and save labor.

Use the Hotchkiss Steel Forms for Roadways, curbs and gutters, ridge culverts and open sluiceways, Concrete walls, Concrete fence posts, etc.

Curb and Gutters—same side-rails used as for curbs or walks, Rails 4" to 12" wide.

## Hotchkiss Metal Form Co.

3016 JARVIS STREET BINGHAMTON, N. Y.

## Force Feed Lubricating Pumps

## Low Water Alarms Gauge Cocks

Hills-McCanna Company  
153 W. Kinzie St., B CHICAGO

EVERY BARREL DEPENDABLE

EVERY BARREL GUARANTEED

## For Every Class of Construction in the South CLINCHFIELD Portland Cement

Is being used by the leading engineers and architects, city and county engineers, railroad engineers, general contractors and the U. S. Government.

In every case where Clinchfield has been used it has met every test and has given complete satisfaction.

Every thought of the manufacturing, technical and selling forces of the company is devoted solely to studying the needs of cement users and dealers in the South.

The main sales and traffic offices of the company are located at the plant. This enables the managers of these departments to give immediate attention to all orders received.

CLINCHFIELD PORTLAND CEMENT CORP.,

Office and Mills: KINGSPORT, TENN.



IF you are in the market for a Block Machine or Mixer send for our catalog; we make a line of machines that you should investigate before placing your order; for variety of product and quickness of operation they are unrivaled.

Wichita Concrete Machinery Co.

232 North Santa Fe Ave. WICHITA, KAS.

Here is a Glazing Composition that will



Adhere tightly to iron, steel, wood, glass, stone or concrete, make an elastic joint—tight yet definitely flexible, preventing glass from cracking.

Guaranteed to withstand heat, cold, rain or extreme climate conditions, without chipping or peeling.

KUHLS'

ELASTIC GLAZING COMPOSITIONS

is used for bedding and glazing all classes of glass construction and is unequalled for securely setting floor or wall tile. Also supplied in shades to match for pointing up stone work, terra cotta, granite, etc. Literature on application giving your nearest dealer, or make application to your own.



H. B. FRED KUHL'S

Sole Manufacturer  
415 Third Ave. BROOKLYN, N. Y.

## Contractors' Machinery.

Supplies and repairs. Steam and Gasoline Engines. Boilers, Tanks, Stacks and Pipe. Boiler-Flues. Fittings. Concrete bars and Binders. Chain hoist. Rope. Cable and Blocks. Barrows. Shovels. Beams.

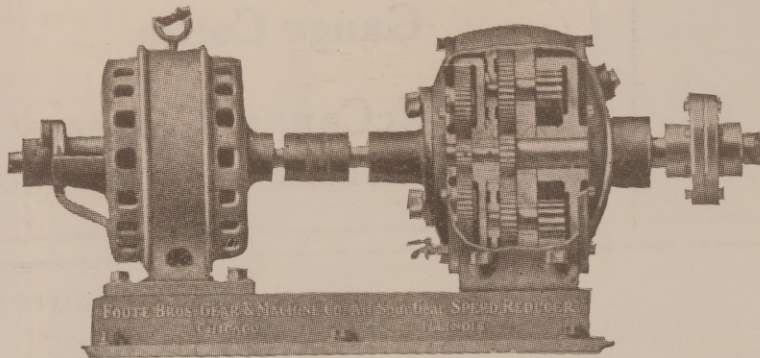
Lombard Iron Works & Supply Co.  
Augusta, Ga.



# SPUR GEAR SPEED TRANSFORMERS

MADE IN ANY RATIO AND HORSE POWER TO SUIT YOUR REQUIREMENTS

## WHY YOU NEED ONE



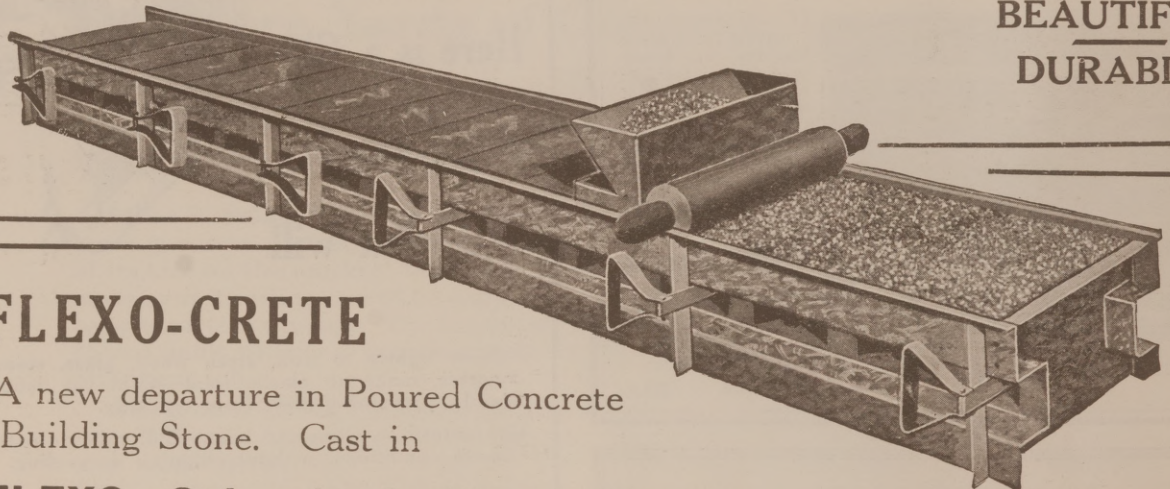
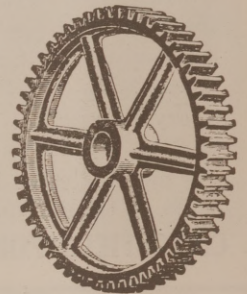
- Safety First
- Small Cost of Installing
- Highest Efficiency
- Not Affected by Dust or Grit
- Oil Tight
- Small Cost of Maintenance
- No Noise
- The Gears in this Transmission are Hardened Steel
- And Made for Continuous Duty

We specialize on Hardened Steel Gears for all purposes and make Cut Gears of all kinds up to 12 ft. diameter.

Send for valuable gear data book and price list. Catalog C. A., No. 12.

## FOOTE BROS. GEAR and MACHINE COMPANY

210 N. CARPENTER STREET : : : : CHICAGO, ILL.



**BEAUTIFUL  
DURABLE**

## FLEXPAC

A new departure in Poured Concrete Building Stone. Cast in

### FLEXPAC Galvanized Steel Moulds

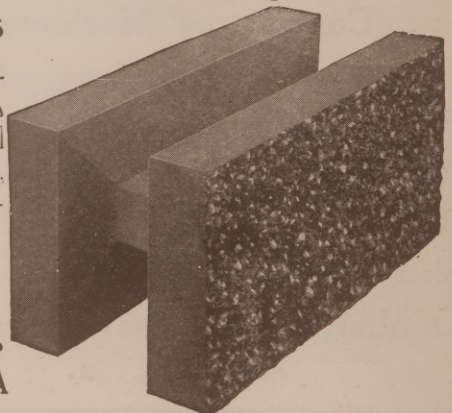
Economy—Speed—Durability and Beauty are four outstanding features of the FLEXPAC process. A thousand beautiful faces can be obtained without additional cost. These moulds are simple, substantial, easily handled, self squaring. The resilient cores fall out when stone is removed. All parts are interchangeable and cannot rust.

*Write for Literature and Prices.*

## FLEXPAC CONCRETE MOULD CO.

Dearborn Bldg.,

CEDAR RAPIDS, IOWA





# Adamantile

For beauty, economy and permanence, floor your buildings with Adamantile—a dense, practical cement flooring tile manufactured under high power, hydraulic pressure.

Write for Adamantile booklet.

**National Mosaic Tile Company**

Manufacturers & Contractors - MOBILE, ALA.

The Mark of Quality **REGISTERED ECONOMY** Protects the User **Economize**  
U.S. PAT. OFFICE with

## ECONOMY



Blue Print Filing Sections.

Economy Filing Cases Everywhere Why?

In Wood and Steel Write for illustrated Catalog Today

Economy Drawing Table Mfg. Co. Adrian, Mich.

## Be Alive to Your Opportunity and Buy or Sell Something Worth While



Small Truck Answering Call of a Hurry-up Order.

HALL INTERLOCKING CONCRETE CULVERTS ARE GUARANTEED to give satisfaction BECAUSE it is designed and proportioned under the most complete skill and authority America affords. If you are a contractor you should manufacture them. If you are a Supervisor or interested in getting good material you should investigate our culvert. It's made with slush concrete in steel molds and is properly reinforced, will stand for ages. We have located factories in twelve states and they are all making good. It's a money maker and a neat article.

Let us tell you more about the HALL INTERLOCKING CONCRETE CULVERT and its possibilities in these days of highway construction. Write for further information.

### HALL CULVERT COMPANY

11th and Market Sts.,

DES MOINES, IOWA

## Miami Trailers Will More Than Double the Value of your Truck or Automobile

They are built in capacities, from 800 to 6000 pounds. Twenty different models with a body to suit your particular business.

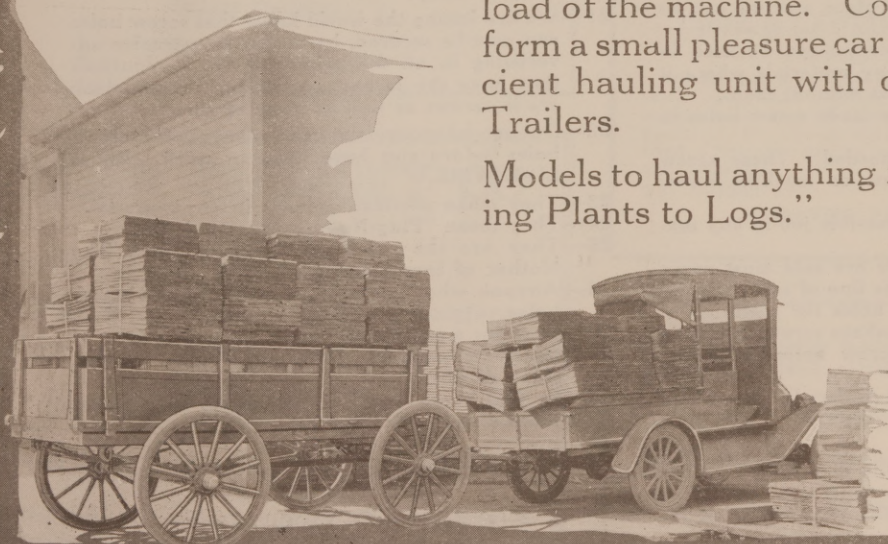
This Model No. 3 is being pulled by a Ford with three times the load of the machine. Contractors can transform a small pleasure car or truck into an efficient hauling unit with one or more Miami Trailers.

Models to haul anything from "House Lighting Plants to Logs."

### Miami Trailer Co.

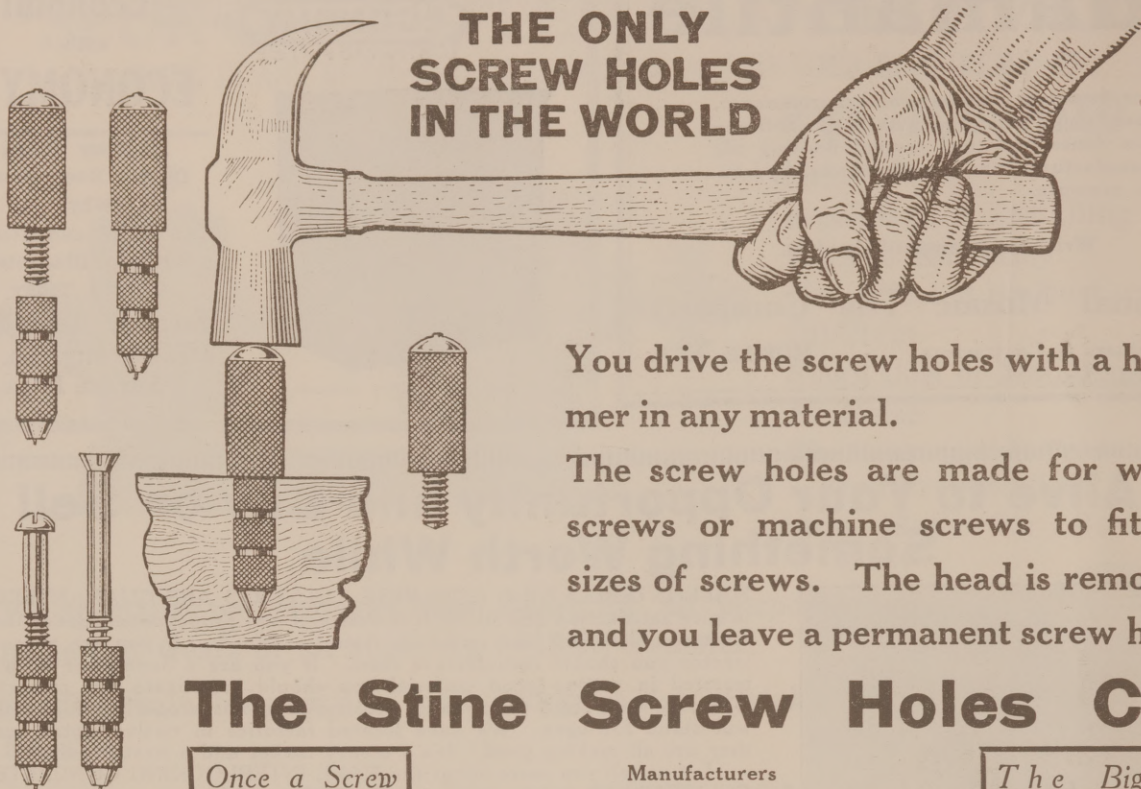
Troy, Ohio, U. S. A.

Put your hauling problems up to us. Let us demonstrate that you can Solve your Transportation Troubles. Send for Literature.





## THE ONLY SCREW HOLES IN THE WORLD



You drive the screw holes with a hammer in any material.

The screw holes are made for wood screws or machine screws to fit all sizes of screws. The head is removed and you leave a permanent screw hole.

## The Stine Screw Holes Co.

*Once a Screw  
Hole, Always  
a Screw Hole*

Manufacturers  
WATERBURY, CONN., U. S. A.

Department 10

*The Biggest  
Little Thing  
in the World*

### Some of the Reasons Why Screw Holes Will Be Bought and Used and Not Become Dead Stock for Anyone.

- 1—They can be used without damage to receiving material.
- 2—They enable you to standardize to wood or machine screws in all material.
- 3—They are made of brass and will not rust under atmospheric or moisture conditions.
- 4—ECONOMY—They save more time value than the holes cost.
- 5—You get them for nothing and are paid for using them when you count time saved.
- 6—Screw holes have been needed ever since the first screw was used.
- 7—Special tools are NOT needed in using them in any material.
- 8—They can be used in any place a screw can be used.
- 9—By using screw holes, screws can be used in many places, and in many materials where it is impossible to use screws without them.
- 10—These are the only ready-made screw holes in the world.
- 11—No special screws are needed. These screw holes fit any wood screw or machine screw now in stock.
- 12—They make the neatest possible job in any material.
- 13—Every store where screws are sold must carry them in stock, because the line of screws is not complete without screw holes for them.
- 14—Every shop and factory where screws are used must also have these screw holes to fit the screws.
- 15—They are endorsed by all dealers in screws and by all users of screws.
- 16—Screw holes are entirely new and the world supply is yet to be furnished.
- 17—This is a progressive Old World of ours, and every active person in it must adopt all improved methods, and all new articles that will help him keep in the front line of progress.
- 18—Be among the first to stock up in screw holes if you are a dealer in screws.
- 19—Be among the first to install screw holes in your shop or factory, as you begin to save money soon as you use them.
- 20—In spite of the high cost of brass, screw holes are yet cheap.
- 21—We are letting the world know that screw holes can now be secured, by means of extensive advertising in all the principal Trade Journals that have the largest circulation among dealers in screws as well as users of screws.
- 22—Do not let your customer ask you for screw holes before you have them in stock. BE A LIVE WIRE.
- 23—They make everlasting holes in any material.
- 24—They mean "Plug-No-More" screw holes.
- 25—They are the result of Necessity being The Mother of Invention.
- 26—Anyone who can drive a nail can use screw holes.
- 27—Send for a sample and convince yourself.
- 28—Mechanics who see them say, "What do you think of that?"
- 29—In fact there are NO REASONS why screw holes should NOT be used.

Each of these reasons is enough to sell Screw Holes. There are many other reasons.

Write at once for our handsome *Color Card* showing screw holes in various materials which will be sent on request, together with samples and price list.



# THE POLK SYSTEM

All Steel Machines for all kinds of

## Circular Concrete Construction

*We Contract Grain Storages.*

### Polk Genung Polk Company

521 Occidental Bldg.,  
INDIANAPOLIS, IND.

Fort Branch  
INDIANA

#### WANTED—CEMENT CHEMIST AND OUTFIT.

WANTED—Experienced cement chemist, must be capable of acting as assistant manager.

WANTED—Complete second-hand cement plant and laboratory outfit. Must be in first-class condition.

WANTED—Complete second-hand cement plant machine shop.

ROBERTSON-COLE COMPANY,  
Singer Building,  
NEW YORK, N. Y.

C. A. P. Turner, M. Am. Soc. C. E.  
Consulting Engineer  
816 Phoenix Bldg.,  
MINNEAPOLIS, MINN.

Bridges, Buildings, Concrete-Steel  
Construction.

#### COOK & LAURIE GRAVEL COMPANY Capacity 15 Cars Per Day

Washed and Screened gravel and Sand for all purposes. Concrete Gravel, Roofing Gravel, Reinforced Concrete Gravel (thoroughly tested and proved superior to granite in fire resisting qualities), Pea Gravel, Screened Sand, Concrete Sand, Marble Sand (finest for sawing marble). Used throughout Georgia and Alabama.

91 $\frac{1}{2}$  Madison Ave. : MONTGOMERY, ALA.  
GRAVEL PIT, COOK'S, ALA.

### SINGER CHIMNEY CO

(Not Inc.)

Engineers and Builders of  
Radial Brick — Common Brick — Reinforced  
Concrete

#### CHIMNEYS

Home Office: CHICAGO, ILL., 2842 Southport  
ST. LOUIS, MO., 1906-12 Pine St.  
MILWAUKEE, WIS., 631 M. & M. Bank Bldg.  
MINNEAPOLIS, MINN., Metropolitan Life Bldg.

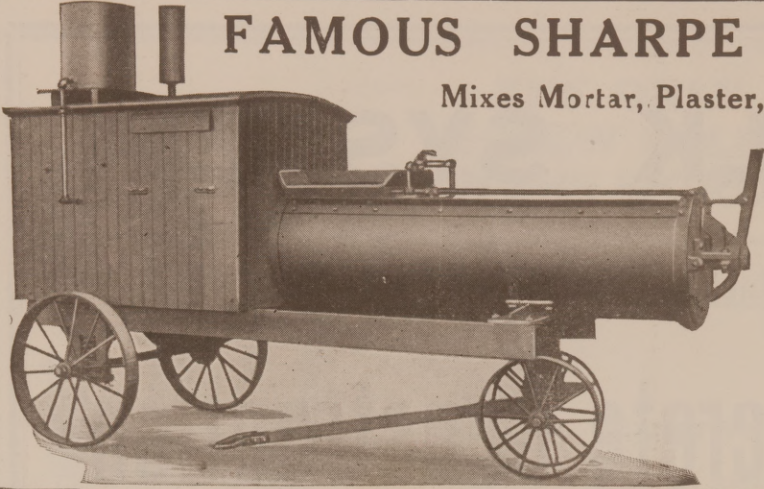
### KIRKPATRICK SAND AND CEMENT CO.

BIRMINGHAM, ALABAMA

All Grades of Sand and Gravel for construction and  
foundry purposes.

CAPACITY ONE HUNDRED CARS DAILY.





## FAMOUS SHARPE MORTAR MIXER


Mixes Mortar, Plaster, Cement, Fire Clay or Concrete.

Will Supply 50 to 75 Bricklayers.  
Belt Pulleys to Operate Other Machinery.

Run for 30 cents per day.  
The Result of 20 Years Experience.

AGENTS WANTED.

**Commonwealth Motors Company,**  
CHICAGO, ILLS.



## Southern States Portland Cement

We produce only one grade—*THE HIGHEST*  
ALWAYS UNIFORM

LET US QUOTE YOU

**Southern States Portland Cement Co.** Office and Mills  
ROCKMART, GEORGIA

## ALPHABETICAL DIRECTORY OF ADVERTISERS

A. & J. Mfg. Co. .... 6	Flexo Concrete Mould Co.....30	McAdam Cement Works..... 4	Standard Cement Const. Co. Front Page
Acme Hollow Wall Co..... 5	Foote Bros. Gear & Mch. Co...30	Martin Co., L. ....35	Standard Port. Cem. Co. .... 4
American Steel & Wire Co....35		Martin Rocking Fifth Wheel Company .....27	Starks Mfg. Co. .... 2
Art Stone Co. .... 2		Merchants & Evans Co. .... 7	Standard Port. Cem. Co. .....Front Cover
Austin Company ,F. C..... 4			Standard Scale & Supply Co., The .....28
	Giant Portland Cement Co....26	Miami Trailer Co. ....31	Stine Screw Holes Co. ....32
Belmont Iron Works ..... 6		Moss-Downer Lbr. Co....Front P.	Schlueter, M. L. .... 4
Brock's Concrete Roofing Tile .....Back Outside Cover	Handy Sack Baler Co..... 3	Nat. Plastic Relief Co. .... 6	S. P. Stone Co. .... 9
Bryan Electric Co...Back outside Cover	Henry Airtight Weatherstrip Co. 9	National Mosaic Tile Co..... 31	Singer Chimney Co. ....33
Bruner, P. M. ....Back Page	Hall Culvert Co. ....31	Ohio Tile Machinery Co. .... 5	
Burrell Mfg. & Sup. Co. .... 3	Hills-McCanna Co. ....29	Pipe Railing Const. Co. Front Cover	Turner, C. A. P.....33
Calvert Mortar Color Works...33	Hotchkiss Metal Form Co.....29	Polk-Genung-Polk Co. ....33	Taylor Lumber Co. ....Front Page
Central of Georgia Railway...35		Portland Cement Association...25	
Chesley Co., A. C. .... 6		Portland Cement Products Co... 5	Universal Road Machinery Co. 2
Cincinnati Iron & Steel Co....35	Kemper Granite Mold Co. .... 9	Republic Iron Works..Front Page	United States Tent & Awning Co. .... 2
Clinchfield Portland Cement Co. 29	Kirkpatrick Sand & Cement Company .....33	Robertson-Cole Co. ....33	
Commonwealth Motors Co.....34	Kramer Automatic Tamper Co... 3	Rowe Mfg. Co. .... 3	Vincent, George ....Front Cover
Cook & Laurie Gravel Co.....33	Kuhl, H. B. Fred .....29	Sauerman Bros. .... 2	Vincennes Bridge Co...Back Cover
Chattanooga Paint Co. Front Cover.		Sasgen Derrick Co....Back Cover	Warren-Knight Co. .... 4
		Sealer Distributing Co..... 9	Wichita Concrete Machy. Co...29
Dixie Portland Cement Co..... 3		Smith Silo Hardware Co. .... 28	Williams & Co., C. K. .....Back Outside Cover
Empire Metal Tank Works...26	La Grange Specialty Co. .... 2	Snead Architectural Iron Works .....28	Willis Mfg. Co. ....35
Economy Drawing Table Co...31	Lombard Iron Works .....29	Southern States Portland Ce- ment Company .....34	



**THE CINCINNATI  
IRON AND STEEL  
COMPANY**

CINCINNATI, U. S. A.

**Offers  
CISCO  
Service**

To All Users of  
**IRON AND STEEL**

**We carry large stocks of all products**

**Willis Mfg. Co.**

*Manufacturers of all kinds of  
Sheet Metal Building Products*



Send for our 180-page fully illustrated catalog which contains a vast amount of information on sheet metal products. The contractor's best reference book.

**Willis Manufacturing Company**  
GALESBURG, ILLINOIS.

**THE L. MARTIN CO.**

HEADQUARTERS FOR

**LAMP BLACK**

SINCE 1849

We specialize in blacks for Sidewalks, Concrete Blocks, Mortar Joints. If you want that cool clear blue gray tone and smooth finish without streakiness specify and use blacks made only by

**THE L. MARTIN CO.**

Originators of "Old Standard," "Eagle," "Pyramid," "Globe," "Germantown" Brands.

81 Fulton Street New York  
AND ALL FIRST CLASS DEALERS  
Address "Dept. B."

**Concrete Roads Must Be Reinforced**

It is demonstrated beyond doubt that to make concrete roads proof against heavy motor traffic, weather and time, a fabric of steel must be incorporated in the concrete.

Several great states have so ruled  
**AMERICAN STEEL & WIRE COMPANY'S  
CONCRETE REINFORCEMENT**

fulfills every engineering requirement  
Services of our road engineers always  
available—free

Send for book on road building  
**American Steel & Wire Company**  
Chicago New York

**VINCENNES BRIDGE CO.**

*Bridges, Structural Work*

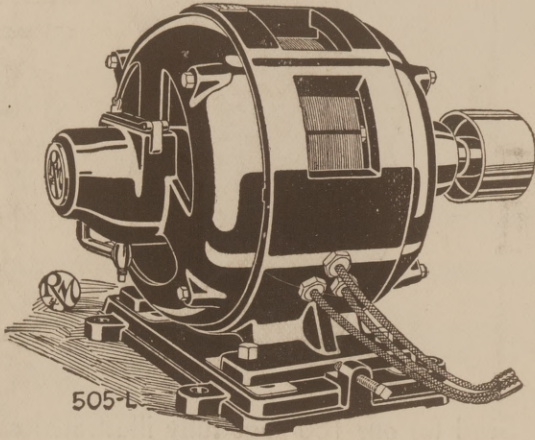
VINCENNES, : : INDIANA

Address nearest office MUSKOGEE, OKLAHOMA



# BRYAN ELECTRIC CO.

58 EDGEWOOD AVENUE, ATLANTA, GA.



Electric Light, Power, Telephone and Bell Wiring for Residence, Stores and Factories.

Estimates Furnished

Rewinding For Motors, Generators

All kinds of new and used Electrical Machinery bought, sold and exchanged.

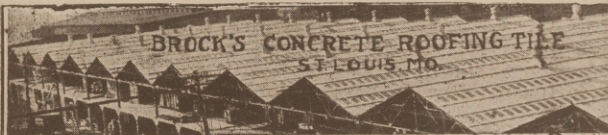
ALL KINDS of ELECTRICAL WORK

TELEPHONE YOUR WANTS

LOCAL AND LONG DISTANCE

MOTORS RENTED

Ivy 1788-179



Concrete Roofing Tile for Factory and Residence; also Roofing Tile Machines.

**Brock Bros. Manufacturing Co.,**  
4334 Hunt Ave., ST. LOUIS, MO.

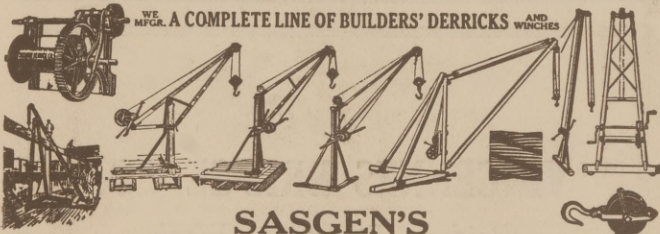


**ANCHOR BRAND**  
**MORTAR AND CEMENT COLORS**

Red, Buff, Black and Brown. Strong Coloring Power and Permanency. These are essential features. Finely ground color is our talking point. Our Anchor Brand is the finest ground and strongest manufactured. Write for samples and prices.

C. K. WILLIAMS & CO.,

Easton, Pa., U. S. A.



**SASGEN'S**  
Latest Illustrated Circular

Will show you how to get the right derrick at the right price, and get it quick. Write now for Circular No. 20.

**SASGEN DERRICK CO.,** Grand & Albany Aves., CHICAGO  
Canadian Office: 1 Wabash Avenue, Toronto.  
New York Office: Grand Central Terminal.

## BRUNNER'S PATENT Dustless Floor Finish

Responsible Licensees Wanted  
In Every City

**P. M. BRUNNER**

618 Frisco Bldg.

St. Louis, Mo.