

# THE CONCRETE AGE

DALTON and Atlanta GEORGIA

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. XXXIII. MONTHLY DALTON and Atlanta, NOVEMBER, 1920. \$1.00 Per Year. No. 2

## Adjustable Poured Block and Concrete Log Molds

Pour your block in adjustable, non-sweat, true-to-size metal molds and you'll have a dense, waterproof, flint-hard product that will sell itself. Molds make standard 8x8x16 units and 8x8 blocks of any length up to 8-ft., with air courses up and down, along the sides and around the corners, making a complete insulated air course.

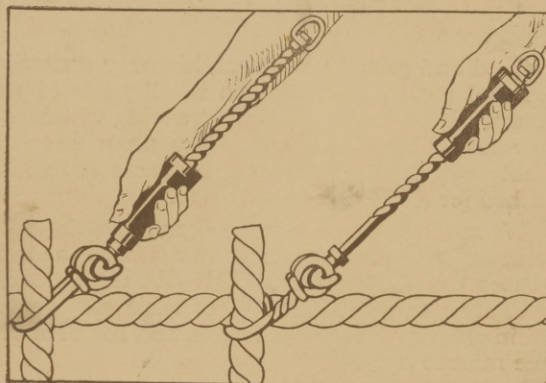
The same molds that form the standard block can be used for pouring the logs. Out in this country, houses built of concrete logs, poured in adjustable metal molds, are mighty popular.

*Ask for Catalog and Exclusive Territory.*

**Ray County Concrete Mfg. Co.**  
Richmond, Mo.

FRANK CREASON, Manager.

W. A. MULLIN, Engineer.



**You Are Out of Wire.  
We Have Full Stock.  
Wire Ties for Reinforcing Steel.  
Send In Your Orders Now.  
Thousands Using Them.**

**Bates Valve Bag Co.**

7310 So. Chicago Ave.

CHICAGO, ILL.

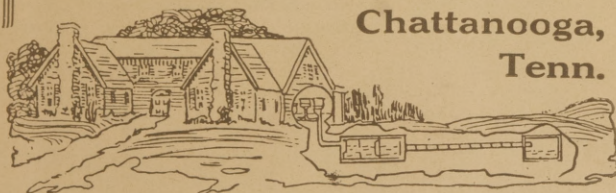
## SEPTIC TANKS

Scientifically Designed for Suburban Sanitation.

*Write for Circular.*

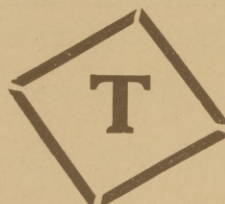
**E. J. NOBLETT MFG. CO.**

Chattanooga,  
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Alabama Hewn Oak Timber

Trade



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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.

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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.

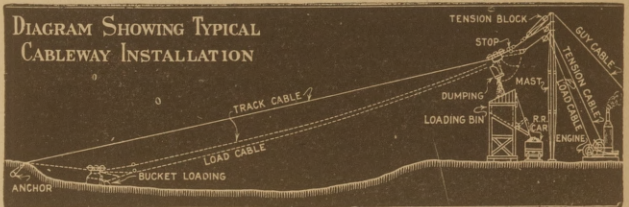
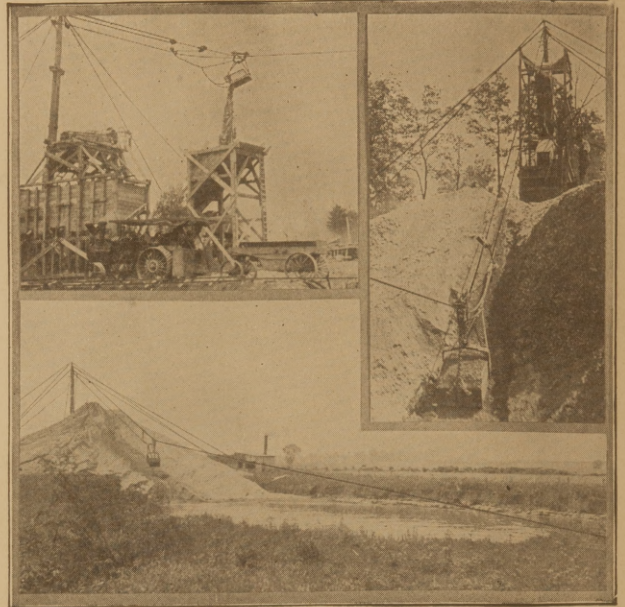
Sand and gravel producers, highway contractors and road commissioners in all parts of the country have proved the great saving which can be affected by installing the Sauerman Dragline Cableway Excavator when materials are to be rushed for a big job of road work.

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.

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Cableway Excavators Cableway Accessories  
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Lugs

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Twisted or  
Deformed  
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Start a Business of Your Own.

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

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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.

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are cheap insurance**

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

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—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.

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**Quality Higher Than the Price**

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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.

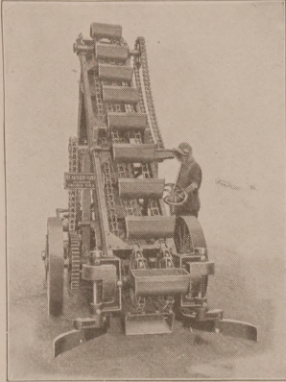
We furnish a complete outfit with each machine for making Rock or Plain face blocks.

Our Prices will surprise you. Send for Catalogue today.

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## AUSTIN Self-Feeding Wagon Loader

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

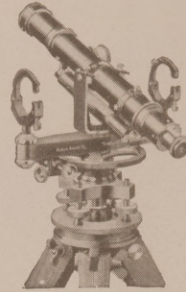
handling of material in concrete road and building construction, excavation work, quarry, storage and reclaiming plants and coal and material yards.

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.

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### 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!

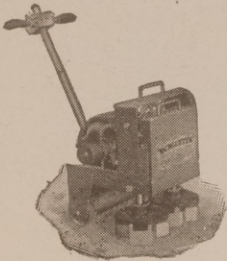
"McAdamite" is something new. Nothing like it on the market. Absolutely prevents cement from sticking to the forms and product comes out with a smooth, glossy surface, resembling the work of a trowel. Saves more than the price of other oils in labor. Gallon lots \$1.25 per gallon. Five gallons or more,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

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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 oints or warped edges. *Perfect results guaranteed.* More than 20,000 in use.

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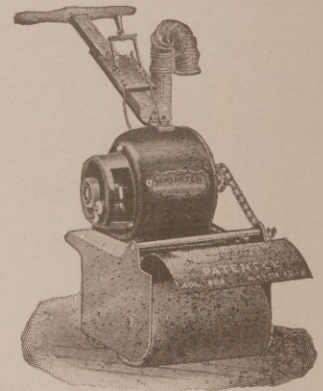
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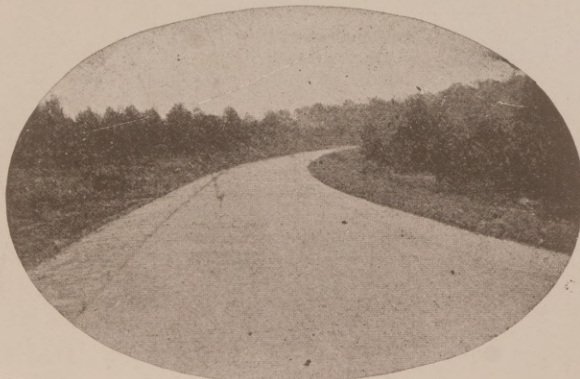
CHICAGO, ILL.

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



Made in several sizes.



### 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

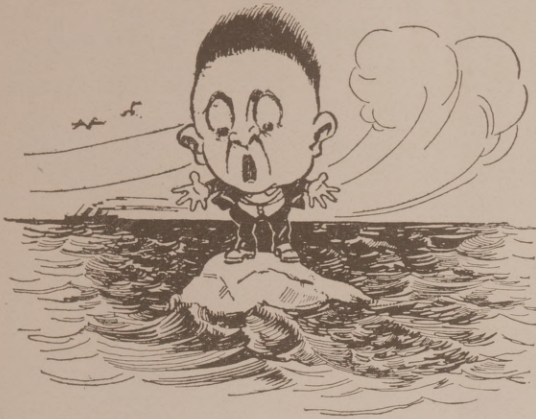
#### Concrete Practically Eliminates Maintenance.

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



## Held There by Water

The force of water, whether at rest or in motion, merely binds Starks Waterproofing paint more firmly to the structure it covers.

Surfaces submerged under pressure or exposed to driving rains are hardened and made absolutely waterproof by

## Starks Waterproofing Paint

Whether you are selling or using building supplies, it will pay you to be acquainted with

### The Starks Line

Waterproofing Paint

Concrete  
Cement  
Brick  
Stucco

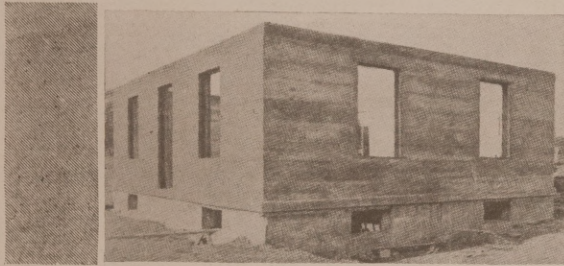
Waterproofing

Cement Putty

## The Starks Manufacturing Co.

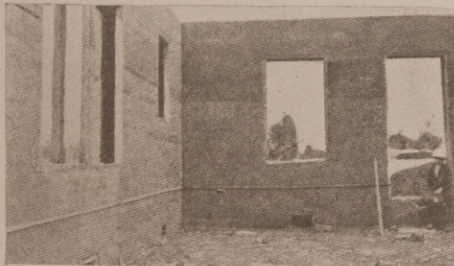
First and Main

Kansas City, Mo.



# ACME

## Hollow Wall System

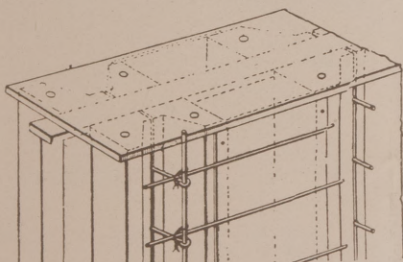


Speed and low-cost in building hollow walls—your bid low enough to get the business—high enough to make good money—and the speed gets you away to the next job in a hurry. That's how the Acme System works.

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 IRON WORKS

PHILADELPHIA NEW YORK EDDYSTONE

ENGINEERS—CONTRACTORS—EXPORTERS

## STRUCTURAL STEEL

COMPLETE INDUSTRIAL BUILDINGS

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22d & WASHINGTON AVE.

CABLE ADDRESS  
"BELIRON"



NEW YORK OFFICE  
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Code Western Union  
fire letter addition.

Illustrated atalog 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



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

As here shown, will be found in all of our mouldings 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.

## 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.

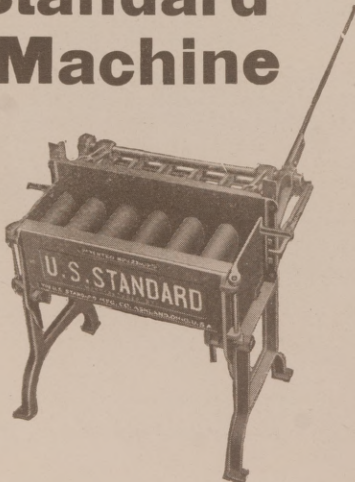
## U. S. Standard Block Machine

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  
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with Frames  
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Write for  
Booklets and  
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A. C. Chesley Co.  
Inc.  
279 Rider Ave., New York, N. Y.

# THE CONCRETE AGE

VOL. XXXIII. November, 1920

No. 2

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.*

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## Cause for Thanksgiving.

If on Thursday the 25th we look on the bright side of things there will be abundance of incentive for thanksgiving. Our government is still dominant in the affairs of our country. A large majority of our people is still determined to protect our institutions. Some substantial progress has been made in the adjustment of business and industry to peace conditions. There are increasing evidences of the disposition of all right-thinking people to seek solutions for economic problems that will be just and advantageous to the greatest number of people. America still is the land of the free, the land of opportunity and of achievement. We certainly have a bright side to inspire us with thanksgiving.

And behind achievement is the still greater cause for thanksgiving, found in that staunch, loyal citizenship which has made the bright side possible. This cause is all the greater because citizenship has labored under conditions that challenged its loyalty, its devotions to ideals, and its ability to achieve. Thank God it has so far accepted every challenge and in every contest supported right against wrong, and will, with the help of God, continue to fight for the right no matter what the assault on our government and our institutions. So on this last Thursday in November let gratitude for strength and blessing be mingled with supplication for future help and guidance.

## Florida Road Building

Florida believes in roads—good roads. Statistics recently collected show that so far counties in that state have issued road bonds in the sum of \$16,390,203. Special road and bridge districts in the state have issued bonds aggregating \$10,221,500. This is a total of \$27,211,703 of bonded indebtedness incurred in the effort to give Florida first-class highways. As a road builder, Florida certainly is one of the most enterprising of Southern states.

## A Typical Housing Situation.

A typical housing situation is that in Albany, Ga., which, like many other prospering Georgia cities is experiencing growing pains. In Albany there are not enough houses to go around. Newcomers find it

difficult to find accommodations. Albany's only consolation is that practically every other live-wire city in the South is in precisely the same situation. The Albany Herald tells us of housing conditions in that city. There are scores of other cities in the South where the housing situation is as bad if not worse. This is the best indication of why building in the South must continue.

---

#### No Trouble Here in South.

Concrete work cannot well be carried on in the North in the winter. In our own section, concrete work can proceed the year round without hindrance. There will be more or less available cement this winter—the output of northern mills as well as southern mills. The practical point is made, Why not get a generous share of this cement while the getting is good; why not use it this very winter? It is predicted that next spring there will be an unprecedented demand for cement construction and road work which will be carried on while the northern work is practically idle. It is not a smart thing for the South to anticipate obvious conditions and use every available barrel of cement this winter?

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#### Use of Wet and Dry Sand for Concrete.

The Technical News Bulletin, No. 38, issued June 4, by the Bureau of Standards, Department of Commerce, Washington, D. C., announces that during the past month (May) several series of tests of concrete made from Potomac River sand and gravel have been carried out, 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 results of these tests emphasize a feature of considerable importance to the contractor. When aggregates are proportioned by volume measure, as is customary on most construction work, it is found that the use of wet aggregates requires one-half to 1 bag more cement per cubic yard of concrete than do dry aggregates. Sand is generally wet 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 cement, 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 in-

crease 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 improvement 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 the 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.

---

#### Climate and the Dairy Barn.

The committee on ventilation of farm buildings of the American Society of Agricultural Engineers is making a study of the proper housing conditions for stock in different parts of the United States and Canada.

As the cow is the source of heat in the dairy barn it follows that the construction and ventilation of the barns must be different in the northern part of the country than in the southern to maintain the proper temperature and sanitary condition of the air.

An article under the head of "Climatic Dairy Barns." by W. B. Clarkson and C. S. Whitnah will be published in the October number of the society's journal "Agricultural Engineering." The authors have divided the country into four well defined zones, based on sustained low temperatures in the winter months, and outline the proper types of barn in its relation to the temperature of the different zones.

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#### Publishers Statement.

Of the ownership, management, etc., of The Concrete Age, published monthly at Dalton, Ga., Business office at Atlanta, Ga., required by act of August 24, 1912.

B. H. Watts, Editor and Managing Editor, Atlanta, Ga.

H. E. Harman, Owner and Publisher, Atlanta, Ga.

H. E. Marman, Manager, Atlanta, Ga.

(Signed) H. E. Harman, Owner.

Sworn to and subscribed before me this 9th day of October, 1920.

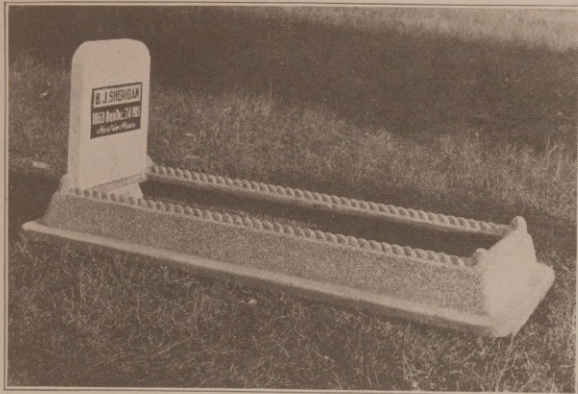
FRED McSWAIN,

Notary Public Georgia, State at Large.

(My commission expires February 1, 1922.)



## 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

CARPENTERS 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

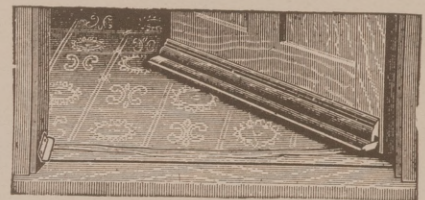


for the bottom of doors and hinged windows. It's automatic. Fits down tight against worn sills as well as new ones. Keeps out every bit of cold, snow and rain and dust. Saves fuel. Sells fast; everybody wants it for economy's sake. Simple; easy to put on. Approved by architects, carpenters, and builders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

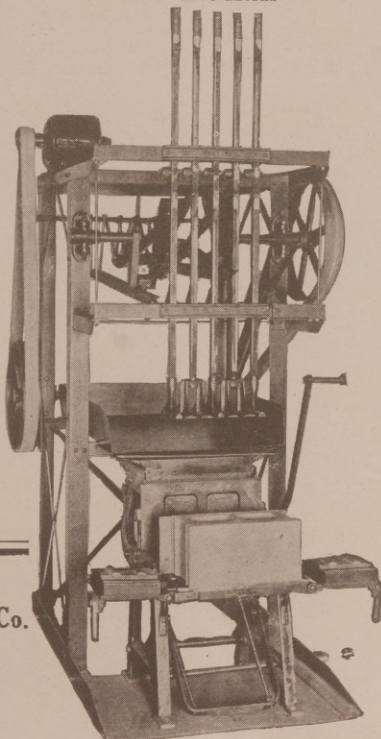
In severe tests, Perfect Concrete Brick have proven stronger than common clay and pressed clay brick.

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.

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



Late Model—Gearless and Noiseless.

Manufactured by  
**The Sealer Distributing Co.**

2553 Railway Exchange Bldg.  
CHICAGO

## When a Reinforcing Bar Needs to be Bent



It needs to be bent then, on the spot, any angle, no slipping or creeping,—bent the way wanted.

Contractors cannot afford to be without

## The Waterloo Bar Mending Machine

It's made in 2 sizes, and is guaranteed to bend bars as follows: No. 2 bends cold reinforcing bars including 1 1/4-inch round or square; Price, \$30.00. No. 3 bends cold reinforcing bars including 1 1/2-inch round or square; Price, \$35.00. Bends bars to various angles desired. Has a detachable handle 7 feet long for convenience in handling.

**Waterloo Construction Co. : Waterloo, Iowa**

## Perforated Radial and Common Brick

# CHIMNEYS

**American Chimney Construction Co.**

Suite 407-408 Oxford Bldg., Chicago, Illinois

All Repairs Made While Chimney Is in Use

Cleveland, Ohio, Branch: 505 Superior Building

## 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.

### Roads and Street Construction.

Eutaw, Ala.—Greene County Commrs., B. B. Barnes, Judge; grade and gravel  $2\frac{1}{4}$  mi. road; \$10,000 available; W. M. Thompson, Contr.; H. O. Gosa, Engr.

Benton, Ark.—Benton County Commrs., Road Improvement Dist. 5, L. P. Kemper, Secy., Siloam Springs, Ark.; construct 34.75 mi. road; steel bridges; bids until Oct. 28; changed date from Oct. 21; W. L. Winters, Engr., Fort Smith, Ark.

Benton, Ark.—Benton County Commrs., Road Improvement Dist. 5, L. P. Kemper, Secy., Siloam Springs, Ark.; build steel bridges; 330-ft. timber trestle approach; 200, five 50, 60, 130 and 40-ft. spans; roads; bids until Oct. 28; changed date from Oct. 21; W. L. Winters, Engr., Fort Smith, Ark.

Tampa, Fla.—City Commrs. Public Works, Allen Thomas, Clk.; pave 22d St. and 12th Ave.; asphalt blocks; 2900 sq. yds. pavement, 2085 lin. ft. curb; bids until Oct. 19.

De Land, Fla.—Volusia County Commrs, J. A. Reilly, Chrmn.; construct roads and bridges in Halifax Special Road and Bridge Dist.; issue \$10,000 bonds.

Fort Lauderdale, Fla.—City, H. V. Calder, Clk.; improve streets; voted \$16,000 bonds.

Panama City, Fla.—City; pave streets; sold \$150,000 bonds. Address The Mayor.

Bedford, Ky.—Trimble County Commrs., O. S. Joyce, Clk.; construct roads and bridges; \$23,000 bonds.

Covington, Ky.—City; resurface 15 blocks on Scott St.; vote on \$70,000 bonds; 5 blocks on Main St.; vote on \$30,000 bonds; improve 16 blocks DeCoursey Ave.; vote on \$50,000 bonds. Address The Mayor.

Bogalusa, La.—City; improve streets and bridges; vote on tax. Address The Mayor.

Franklinton, La.—Washington Parish Police Jury, J. R. Leslie, Prest.; construct 12.1 mi. road from Clifton; bids until Oct. 22; J. S. Mullings, Highway Engr.

Mandeville, La.—Town, Mayor Van Zant; improve streets, construct road across swamp and complete seawall; vote on bonds and tax.

Chestertown, Md.—State Roads Comsn., 601 Garrett Bldg., Baltimore; construct 1 mi. concrete pavement, 15 ft. wide; \$40,000 available; Kauffman Construction Co., Contr., Denton, Md.

Hazlehurst, Miss.—Copiah County Supvrs.; construct roads; voted \$50,000 bonds.

Indianola, Miss.—City; pave streets and improve water-works; voted \$36,000 bonds. Address The Mayor.

Meridian, Miss.—City, W. H. White, Clk.; grade, curb and pave streets, alleys and repair and resurface streets and avenues; construct storm sewers; bids until Nov. 11; John C. Watts, Engr.

Moss Point, Miss.—City; pave Main St.; concrete; issued \$10,000 bonds. Address The Mayor.

Clayton, Mo.—St. Louis County Commrs.; grade 3000 cu. yds. road; Chas. Fiener, Contr., 6420 Wise Ave., St. Louis.

Ashboro, N. C.—North Carolina State Highway Comsn., Div. Office, Greensboro; construct 9.64 mi. topsoil road; Project 101-B; \$62,558; J. T. Plott, Contr., Greensboro.

Charlotte, N. C.—City Comsn.; pave East Fifth St., Central Hotel alleyway and Amherst place; J. F. Blythe, Contr.

Pittsboro, N. C.—North Carolina State Highway Comsn., Div. Office, Greensboro; construct 21.82 mi. topsoil; gravel or artificial sand, clay surfacing road; Project 99-B; \$125,590; J. T. Plott, Contr., Greensboro.

Sparta, N. C.—North Carolina State Highway Comsn., Div. Office, Greensboro; construct 5 mi. roadway; water-bound macadam; bridges; Project No. 125; \$102,780; W. E. Graham, Contr., Mount Ulla, N. C.

Yanceyville, N. C.—North Carolina State Highway Comsn., Div. Office, Greensboro; construct 11.93 mi. topsoil road; Project 112; \$64,097; J. M. Gregory, Contr., Laurens, S. C.

Sallisaw, Okla.—Sequoyah County Commrs.; construct roads and bridges; vote Nov. 9 on \$200,000 bonds.

Darlington, S. C.—Darlington County Supervisors, W. C. Gandy, Supvr.; construct 20 mi. sand-

clay road and build concrete bridges; \$150,000 available; J. T. Plott, Contr., Greensboro, N. C.; W. S. Lewis, Div. Engr., Florence, S. C.

St. George, S. C.—Dorchester County Highway Comsn., I. S. Hutto in charge, Dorchester, S. C.; grade and sand-clay surface roads from St. George to Edisto River; \$25,000 available; Reed & Smokes, Contrs., St. George; Klutz & Smith, Engrs., Concord, N. C.

Clarksville, Tenn.—City; pave 18 blocks. Address The Mayor.

Jamestown, Tenn.—Fentress County Commrs.; construct 2 highways; voted \$200,000 bonds.

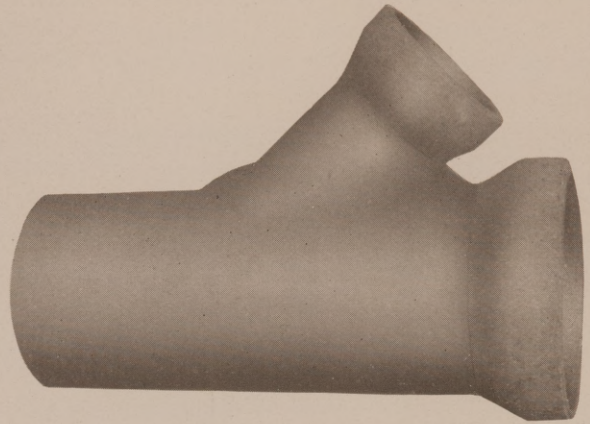
Cleburne, Tex.—Johnson County Commrs.; construct 16 mi. Grandview, 10 mi. Weatherford, 8 mi. Glen Rose and 7 mi. Hillsboro highways; bridge across Nolan River; bids until Oct. 23; Whitaker & Washington, County Engrs.

Houston, Tex.—City; pave La Branch Ave.; Gulf Bitulithic Co., Contr.

Jourdanton, Tex.—Atascosa County Commissioners; construct hard-surfaced road; W. T. Montgomery, Contr.

Victoria, Tex.—Victoria County Commrs.; shell 4½ mi. road; Miller Construction Co., Contr., Houston, Tex.

Hampton Roads, Va.—Bureau Yards and Docks, Navy Dept., Washington, D. C.; construct roads and



## SEWER PIPE

of concrete made according to Zeidler Specifications and on a Pioneer Bell End Sewer Pipe Machine are now recognized and accepted by all engineers as equal to or better than No. 1 Vitrified Pipe.

See report of American Society for Testing Materials adopted 1920. These specifications are based on Zeidler quality pipe.

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Newport News, Va.—City, Floyd A. Hudgins, Clk.; improve streets and construct sewers; \$350,000 drainage system at Naval Operating Base; Atlantic bonds.

St. Albans, W. Va.—City, L. A. Edwards, Clerk; improve Fifth St.; construct 2444 sq. yds. paving; 1582 ft. curb and gutter; green concrete, monolithic brick, cement concrete and bituminous flag macadam; bids until Nov. 11; J. M. Oliver, City Engr., Huntington, W. Va.

Lexington, Miss.—District No. 4 of Holmes county voted \$60,000 of additional road bonds, and District No. 5 \$90,000 of additional road bonds. Chairman County Supervisors.

Georgetown, Ga.—State Highway Department, W. C. Caye, Jr., Division Engineer, Third District, Americus, Ga., will receive proposals until 11 A. M. November 30 for constructing 5 miles of sand-clay road on Georgetown-Fort Gaines road; work will consist of 30,500 cu. yds. common excavation; 1,726 cu. yds. borrow excavation; 2 acres of clearing and grubbing; 39,232 sta. yds. overhaul; 13,094 cu. yds. sand-clay surfacing; necessary pipe, etc. Work to begin about December 15 and to be completed within 180 days. Plans and specifications on file with Mr. Caye at Americus and at the office of the State Highway Engineer, Walton Bldg., Atlanta, Ga., after November 6 and may be had for \$4.

Dothan, Ala.—City; pave North Foster St.; voted bonds. Address The Mayor.

Star City, Ark.—Lincoln County Commrs. Grady-Arkansas River Road Dist., T. S. Lovett, Secy.,

Grady, Ark.; construct 13 mi. gravel road; \$325,000; General Construction Co., Contr.; Barkett & Hight, Engrs., 104 Reigler Bldg.; both Little Rock, Ark.

Moore Haven, Fla.—Town, R. O. Baker, Clk.; construct 12,600 sq. ft. cement sidewalks; 350 cu. yds. parkway; \$6000; Thos. F. Frederick, Engr.; A. T. Calender, Contr.

Pensacola, Fla.—Escambia County Commrs.; construct 102 mi. paved roads; concrete; voted \$2,000,000 bonds.

Rome, Ga.—Floyd County Commrs. Roads and Revenues; construct 7 mi. soil-surfaced roadway; \$65,000 available; J. W. Stapp Construction Co., Contr., Louisville, Ala.; A. A. Simonton, Engr., Rome, Ga.

Savannah, Ga.—City; pave streets; vote on \$50,000 bonds. Address The Mayor.

Winston-Salem, N. C.—City; construct 7000 sq. yds. warrenite-bitulithic pavement on macadam foundation; Atlantic Bitulithic Co., Contr., Richmond, Va.

Franklin, N. C.—Dist. Engr. Bureau Public Roads, U. S. Dept. Agriculture, Washington, D. C.; construct 20.9 mi. Three States National Forest road; graded earth, 16 ft. wide; project within Natchala Forest, Counties of Rabun (Ga.), Macon (N. C.) and Oconee (S. C.); \$216,000 available; Wright & Nave, Contrs., Asheville, N. C.; Vernon M. Peirce, Dist. Engr., Washington, D. C.

Jefferson, N. C.—Ashe County Commrs., J. G. Bright, Highway Engr.; construct 6.03 mi., 42,523 sq. yds., water-bound macadam, bituminous macadam or gravel paving; 2.03 mi. 16 ft. wide and 4 mi. 10 ft. wide; bids until Oct. 20.

## The "Concrete Age" in France

### The "Concrete Age" in France.

THE French peasant has evolved from the stone age of building into the concrete. Necessity for quick and economical reconstruction to replace the millions of homes laid in ruins by the war has overwhelmed his traditional prejudice against living in any type of home different from the stone cottage of his forefathers.

Major George B. Ford, an American town-planning expert loaned to the French government by the American Red Cross, pointed out the advantages of concrete in the reconstruction of the 3,000 wrecked towns in the devastated areas of Northern France. The amount of skilled labor required in erecting concrete structures is much less than in putting up

stone or brick buildings, and cement is easily obtainable. Before the war France produced about 3,000,000 tons of cement annually and the production has already reached almost pre-war figures.

In the new type of concrete-poured home, now popularized in France, wooden forms are erected and every part of the house, from foundation to chimney pots, is made by pouring concrete into these forms. Even the roofs are made of concrete, two inches thick, and projecting in wide eaves in a bungalow effect never before produced in concrete.

Much of the concrete mixture is salvaged from the debris of ruined buildings. This broken stone is put through a rock crusher and mixer. Occasionally a hand grenade gets into the crusher or the mix-

er and a loud report announces that some one has been careless. But the machines are of cast-iron and steel and the fragments of the grenade do no damage beyond scarring the teeth of the mixer.

Sometimes ground up brick takes the place of stone and when this happens a distinctly reddish tinge is given to the building. By using the ground brick and ground stone alternately the builders have produced colored panels in the walls.

In some sections of France, on the Somme, for instance, the clay subsoil causes rapid disintegration in concrete work. Lieutenant George Stone, engaged in distributing American Red Cross relief supplies among the homeless laborers who are rebuilding their homes on the Somme, suggested a way to obviate this.

The excavations are lined with tarred roofing paper covered afterwards with hot pitch. In this waterproof mould the foundation may be poured without danger of frost cracks in winter.

Sand for the concrete mixed here is procured from the old battle fields. Back of their lines the German army left dumps of sand which they had brought from Holland to make concrete fortifications.

Explosion casualties are common among the workmen engaged in sorting the debris and the Red Cross hospital at Lens has special instruments for extracting shell splinters.

Corporations in the United States are looking on with keen interest at the way construction problems are being handled in France. For according to statistics compiled by the Department of Labor, 1,300,000 buildings are needed in the United States to care for the population and commercial interests. Six thousand hotels are needed, 55,000 apartments, nearly 50,000 schools and public institutions and 20,000 theatres and churches. Manufacturing interests require a total of approximately 325,000 buildings costing less than \$100,000 and about 128,000 costing more than that amount. Major freight terminals to the number of 120 and 14,000 railroad stations and freight sheds represent the demands of transportation and warehouse needs.

The housing situation is of great interest to the public as a whole, touching as it does, so vitally, the health of the nation. People crowded into unsanitary living quarters cannot respond to the health movement which is spreading over the country.

At least 42 per cent of all deaths in the United States are from preventable diseases. These comprise 400,000 deaths annually—eight times the battle deaths of the American Army in the World War.

Your health authorities need the mobilized efforts of your entire community to combat pneu-

monia, tuberculosis, typhoid and other preventable diseases.

The American Red Cross has elected the field of public health work as the scene of its chief peacetime activity.

Such Red Cross Health Service includes:

(a) Providing, if there is none, a Public Health Nurse for your community.

(b) Establishing a Health Center to unite the efforts of official and other health agencies serving the community. From this radiates Public Health Education by the giving of health information, planning health talks, arranging for the keeping of records of the heights and weights of school children, providing health posters and exhibits, keeping a directory of health agencies, etc.

(c) Promoting Community Health Studies, such as classes in Home Hygiene and Home Care of the Sick, classes for mothers and prospective mothers.

(d) Assisting in organizing and supervising any health activity pertaining to nutrition. Such activities may include work in schools, classes in dietetics and food selection or the establishment of a nutrition center.

(e) Organizing First Aid classes in schools, colleges and communities and promoting the instruction of life saving.

If Red Cross Service is to endure, what is needed is not so much large contributions from a few generous donors, as that many shall be members of the Red Cross, participating in its service, so that it may always be the democratic expression of the spirit of the American people.

It is for this purpose that the Fourth Red Cross Roll Call, November 11-25, is held, to give all Americans an opportunity to join its Health Army, already ten million strong.

#### National Sand and Gravel Producers.

Members of the National Sand and Gravel Producers, from Mississippi, Arkansas and Tennessee, held a meeting Sept. 21, at Memphis, Tenn., for the purpose of discussing before them some of the problems which in recent months have threatened the industry. V. O. Johnston of Lincoln, Ill., president of the association, presided over the meeting and E. G. Sutton, business manager of the national organization was the principal speaker.

During his talk Mr. Sutton discussed the car situation and advance of freight rates and he explained the preferential order recently granted by the Interstate Commerce Commission which permits the use of open top cars in the transportation of sand and gravel and other road-building materials. He said that this order had done much to relieve the situation.

# Concrete Storage Tanks

ROBERT S. LINDSTROM, in Architect and Engineer

THE use of concrete as a material for the construction of tanks for the storage of liquids and fluids such as water, oils and products having a flowing nature, is ever increasing, due to the fact that concrete as a structural material has long since passed the state of experiment and is now universally adopted as one of the leading structural materials. For structural purposes, concrete both plain and reinforced, has by time proven to be non-deteriorating and wearproof material and so generally understood.

The materials entering into the construction of concrete tanks are cement, sand and aggregate mixed with water, together with structural reinforcement bedded into the concrete. Therefore, it is essential that these materials are selected for quality and grading that will produce a water and oil finished concrete tank.

The subject of waterproofing and oil proofing cement and concrete is very complex and may be accepted as a basis of wide divergence of opinions among chemists and others who have made exhaustive studies of cement and concrete waterproofing. Therefore, this branch of concrete tank construction requires the most careful consideration, especially in the field where the human element enters into the proportioning, mixing and placing of the concrete into the forms or moulds.

The term waterproofing, generally speaking, is the method employed for rendering concrete nonporous and dense, which divides itself into three divisions; the integral method, the membrane method and the surface coating method.

For the subject of this topic, we will consider the integral method or the absence of voids by selecting materials that will mix and create a density in the finished concrete tank that will be uniformly distributed throughout the walls and bottom of the tank. Therefore, it will become necessary to select only such materials as will guarantee good results, such as the quality and kind of cement, sand and aggregate and water to use.

**Cement:** The cement should be genuine Portland ground to a fineness of 95 on a 200 mesh sieve. This quality of cement is called a "Reground Cement," which means passing through two stages of grinding until the cement has the fineness of talcum powder, thereby obtaining more colloidal efficiency, waterproofing value or cement glue than is obtained by standard specification for fineness of Portland Cement.

The calcareous matter or particles which do not pass through a 200 mesh sieve are incapable of complete crystallization and, therefore, valueless as a cementing material. The cement attacks the silica of the sand and aggregates and crystallizes into one solid mass in the process of crystallization, the finer the cement the less voids will appear in the completed mass or material called concrete.

The cement used for tank construction should be fresh new cement, as recent researches show that storage of cement where same is subjected to atmospheric changes create marked deterioration in the strength of the cement, due to absorption of atmospheric moisture causing a partial hydration which reduces the early strength of the concrete and prolongs the time of setting. These researches and tests were made on standard Port'and Cement which showed the following losses from the original strength. Deterioration in strength with storage of Portland Cement from 3 months to 2 years time.

3 Month Storage in shed	80% of original strength
6 Month Storage in shed	70% of original strength
1 Year storage in shed	61% of original strength
2 Year Storage in shed	40% of original strength

The cement giving the bond and final strength to the concrete should, therefore, be fresh and properly stored in a moistproof place.

The strength of concrete increases with the fineness of a given lot of cement for all mixes, consistencies, gradings of aggregate and ages of concrete.

**Sand:** The important characteristics of sand for use in concrete are durability, cleanliness and grading. By durability is meant sound, non-deteriorating particles of beads of grade known as torpedo sand, which is screened from gravel.

Cleanliness means free from vegetable or organic matter and grading is the sizes of particles having a certain percentage of coarse and fine grains, sharpness of sand is not absolutely necessary, too fine sand even if free from vegetable and organic matter should not be used. It makes a weaker concrete and requires more cement and a larger proportion of water. "Run of Bank" gravel should never be used. It should first be screened and correctly proportioned to determine the cleanliness of sand. The Colorimetric Test is a very practical and easy field test.

**Method for Field Test:** The field test consists of shaking the sand thoroughly in a dilute solution of sodium hydroxide (NaOH) and observing the resultant color after the mixture has been allowed to stand for a few hours. Fill a 12-ounce graduated

prescription bottle to the 4½ ounce mark with the sand to be tested. Add a 3 per cent solution of sodium hydroxide until the volume of the sand and solution, after shaking, amounts to 7 ounces. Shake thoroughly and let stand for twenty-four hours. Observe the color of the clear liquid above the sand. A good idea of the quality of the sand can be formed earlier than twenty-four hours, although this period is believed to give best results.

If the solution resulting from this treatment is colorless, or has a light yellowish color, the sand may be considered satisfactory in so far as organic impurities are concerned. On the other hand, if a dark-colored solution is produced, the sand should not be used in high-grade work.

**Aggregate:** The aggregate may be gravel, crushed limestone or other local aggregates equal to gravel or crushed limestone. If gravel is used, it should be graded from size that will pass through a ¾-inch ring down to size of sand used, and subjected to the same tests as to durability, cleanliness and grades as above suggested, for the sand.

If crushed limestone is used for aggregate, it should be graded from ¾-inch to ¼-inch in sizes and free from dust, loam and foreign matter, washed clean. Crushed limestone for concrete tank con-

struction has been found to produce a more fire resistive concrete than when gravel has been used for the aggregate.

**Proportions of Mix:** For concrete tank construction the following proportions are recommended. One cubic foot reground cement, two cubic feet sand and three cubic feet of aggregate.

**Water:** The water for mixing concrete should be pure and free from oil, acid, alkali or organic matter and sufficient amount of water used on the mix to bring the mix into consistency of pouring into forms.

**Mixing:** The concrete should be mixed by machine in a batch mixer of a type that will thoroughly mix cement, sand and aggregate into a uniform batch.

**Pouring and Tamping:** The batch should be poured into forms or moulds immediately after being properly mixed, then thoroughly spaded and tamped into place.

**Reinforcement:** The reinforcement should be so placed that the concrete will readily pour and entirely imbed the reinforcement steel as the tightness of the tank depends upon the dense coating around the steel. The steel should not be painted or coated, but clean, as the adhesion of the concrete



Skyline of Dallas from Oak Cliff End of Viaduct—Longest Concrete Viaduct in World.

to the steel depends upon the cleanliness of the steel.

**Plaster Coat:** After the forms have been removed, if any honeycombing or defect appears, the loose and porous portion should be removed and a coat of plaster filling all openings should be done while the tank is still green. This plaster coating should be a mix consisting of one cubic foot of Reground cement and two cubic feet of sand troweled to a smooth even finish.

**Wetting Down:** The tank, if exposed to heat or hot weather, should be wetted down while in the period of setting to prevent crazing of surface exposed to elements.

**Expansion and Contraction:** Expansion and contraction in concrete construction is caused by the expansion and contraction of the steel reinforcement and not in the concrete itself, as the concrete in the process of drying out and hardening naturally causes some shrinkage by the evaporation of the water and suction in the bonding and crystallization of cement with the sand and aggregate.

Therefore, when reground cement is used with proper kinds of sand and aggregate, coupled with

good workmanship, the density throughout the completed mix will prevent moisture and climatic condition from penetrating through the finished dense concrete and thereby practically do away with expansion and contraction of the steel reinforcement.

**Pipe Openings:** The weakest part of any tank construction material is at the openings left for filling and draining when metal pipes are used for this purpose, due to the expansion and contraction of the pipes, also the jar and friction caused by making pipe connections. Therefore, it is of great importance that the sleeve passing through the wall or floor of the tank is securely anchored into the concrete, and this can be accomplished by using a flange sleeve with prongs or long teeth in the center and extending into the concrete, the inner portion of the flange threaded its entire length, and a temporary screw cap for preventing the concrete coming in contact with the threaded portion of the sleeve. After the tank has set and dried out, remove the screw caps and insert an inner treaded pipe treaded the entire length, letting inner and outer ends project enough for the regular pipe connections.

## Cement Testing Urged to Protect User

By H. W. THOMAS, Testing Engineer, Bureau Economic Geology, University of Texas

THE average person thinks of Portland cement as a standard product—that one bag is just like every bag—but this is far from the truth. While the product from one mill may be of uniformly high quality, that from another mill may show large variation in quality or at times may even be unfit for use in high-class construction. While all cements look alike on casual observation, laboratory tests show differences in the strength and permanence of the various cements. To illustrate this point, attention is called to some results of tests recently made by the Division of Engineering Testing Laboratory of the University of Texas.

A contractor in one city in the State recently bought several carloads of cement from a dealer for use in a building he was constructing. Being a careful man, with a reputation for good work, he sent a sample of the cement to the laboratory for test. The test results showed that the strength of the cement was just about half of the value recognized as the minimum permissible for good cement.

On receipt of the report, the contractor immediately told the dealer that the cement was unsatisfactory and would not be accepted. The dealer notified the mill and asked what disposition should be made of the material. He was informed by the mill that the cement had passed their tests satisfactorily, and that they considered the cement as his property, to use as he saw fit. Apparently the dealer's only recourse is to sue the mill for the amount of his loss, since he could not sell the cement. It is only fair to state that this cement was from a mill outside of Texas.

At the other extreme is a cement from a Texas mill which was tested recently and which gave strengths from 70 to 100 per cent higher than the standard requirements, and the product from this mill has been of uniform high quality. In fact, the strength of this cement was the highest ever obtained by this laboratory.

Besides the strength developed by the cement, another very important quality is what is known



as "soundness." This is a measure of a cement's permanence, and it indicates whether or not the concrete is likely to crack and go to pieces within a short time after it is made. With one process of manufacture it is necessary to season the cement by storing for a certain length of time, in order to prevent unsoundness. If, in the desire to market the cement as soon as possible, it is used before it is properly aged, the concrete is likely to go to pieces. As an illustration of this, some concrete structures recently erected in the State began to crack within a short time after they were built, and they are already unfit for use. Investigation has shown that unsound cement was used in their construction, although at the time the importance of soundness was not realized. They know better now!

The whole value of a cement lies in its ability to cement together the sand and gravel, and yet without testing there is no way to judge of its value in this respect. When you buy a sack of cement that has the cementing value of only half a sack or that is so unsound that it soon goes to pieces, about all that you can do is to charge it to "experience" and hope for better luck next time. However, the majority of mills are not like the one in the example above quoted, and they are usually willing to correct any faults where they are to blame.

The way that a dealer or contractor can be sure of obtaining satisfactory cement is to state in the order that it will not be accepted unless it passes the standard specifications for Portland cement of the American Society for Testing Materials. This is a nationally recognized standard of quality, and the purchase of cement under such an agreement will work no hardship to the manufacturers of good cement (since these are the tests to which the manufacturers subject the cement in their own laboratories), but it will prevent any such difficulties as described above.

It should not be thought from this discussion that all cements should be looked upon with suspicion, since the cements failing to pass the tests are a comparatively small proportion of those tested. For the person who uses cement in a small way, it is safe to buy some standard brand without having it tested. But for the dealer or contractor who uses large quantities, the safest policy is to buy it subject to test and then to send a sample for testing to some laboratory, of which there are a number in the state. It is only in this way that he can be sure of the quality of the material he is buying.

If there were a State law defining Portland cement and embodying the Standard Specifications of the American Society for Testing Materials, the purchaser would have some protection in those few cases when inferior cement is sold. But until such a law is passed, it is well for users of cement to

buy it with the understanding that it will not be accepted if it does not pass the standard tests.

That the importance of testing cement is becoming recognized more and more is shown by the increase in the amount of this testing done by the Laboratory of the Division of Engineering. During the first eight months of this year 115 samples of cement were tested, which is almost double the number that were tested in the 12 months of last year.

#### Concrete and Cement Plants.

Bristol, Va.—Municipal Paving & Construction Co.; rebuild burned plant; loss \$7000.

Pensacola, Fla.—Southern Petritite Co., main office De Funiak Springs, Fla.; establish plant; operates plants in West Florida and South Alabama.

Baltimore, Md.—Super-Concrete Mold Co., 1601 Lexington Bldg., inceptd.; capital \$40,000; John W. Smith, Wm. D. Ham.

Dougherty, Okla.—Continental Asphalt & Refining Co.; erect refinery; reinforced concrete and steel; reinforced concrete flooring; concrete foundation; construction by day labor.

New Martinsville, W. Va.—Concrete Blocks. Wetzel Supply Co., inceptd.; capital \$50,000; N. N. Ob-lingerm, Joseph Smith, W. E. Wharton; mfre. concrete building blocks.

Abilene, Tex.—City, E. R. Moore, Box 740, in charge; erect cement plant; daily capacity 100 to 200 bbls.; contemplated.

Concord, N. C.—Furr Construction Co., inceptd.; capital \$10,000; Walter L. Furr, Prest.-Treas.; D. M. Furr, Jr., Secy. and Gen. Mgr.; has plant; equipment purchased; mfre. sewage-disposal tanks, portable septic tanks, etc.; daily capacity 25 complete septic tanks.

Bruner Station, Okla.—Sand Springs Home, Charles Page, Prest., Sand Springs, Okla.; build crusher; plans to mfre. cement.

Ragland, Ala.—National Cement Co. organized; Geo. E. Nicholson, Prest., Kansas City, Mo.; remodel plant; double monthly capacity of 20,000 bbls. Portland cement; later increase output to 2500 bbls. daily; install 36x60-in. jaw crusher, locomotive, cars, etc.

Security, Md.—Security Cement & Lime Co., A. Loring Cover, Prest.; double plant; increase daily capacity from 3000 to 6000 bbls. Portland cement; contemplates similar plan to double Berkley (W. Va.) branch plant.

Berkley, W. Va.—Security Cement & Lime Co., A. Loring Cover, Prest., Security, Md.; double daily capacity Portland cement production; contemplated.

# Tests Show Road Wear and Resistance

**S**UCH important questions as how hard a heavy motor truck pounds a pavement when going at five miles an hour and at 15 miles an hour are being answered by investigators for the Bureau of Public Roads, United States Department of Agriculture, in a series of scientific experiments, which, when completed, promise to be of great value to highway engineers. Already sufficient tests have been made to show that increased speed of a vehicle equipped with hard rubber tires tremendously increases the impact which its wheels make on the roadway where there is any unevenness. On the other hand, where pneumatic tires are used increased speed adds comparatively little to the impact. It has been suggested that these tests will be of great value not only in settling questions of design but may also lead to a rational basis for determining license fees for motor vehicles.

Trucks have been used in these tests varying in size from a 1-ton truck up to a 7½-ton truck carrying an excess load. Each truck was run over a special recording device embedded in a roadway and the impact which resulted when one of the wheels made a 2-inch drop from a ledge built in the surface caused the deformation of specially prepared copper cylinders forming part of the apparatus. The magnitude of the blow was accurately ascertained in pounds by measuring the extent to which the cylinder had been forced out of shape.

Recent tests were made with a 3-ton truck of well-known make loaded with a 4½-ton load so that the total weight on each rear wheel was 7,000 pounds, the unsprung portion (that not supported by the springs) being 1,700 pounds and the sprung portion (that portion supported by the springs) 5,300 pounds. The truck was equipped first with an old solid tire that had been worn down to a thickness of one inch. Then, with exactly the same load on the truck, a wheel was used fitted with a new solid tire 2½ inches in thickness. And finally, the truck was equipped with pneumatic tires 42 by 9 inches and blown up to a pressure of 142 pounds per square inch. The following table shows very clearly the bad effect an old tire is likely to have on a road surface and the greatly lessened impact produced by trucks when they are equipped with pneumatic tires. The tests show that as the vehicle's speed increased the impact from the old hard rubber tire increased greatly. The impact from the new hard rubber tire was somewhat less.

10.2	2"	18,500	14,100	7,800
14.6	2"	26,500	18,700	8,300

Related to these tests is another series which utilizes the figures secured in the first experiments. A number of paving slabs were tested by means of a machine designed to give impacts equivalent to those produced by the rear wheel of the heavy truck already referred to. The unsprung portion of the weight of this machine is 1,500 pounds and the sprung portion weighs 6,000 pounds. The tests were made by raising the entire weight through a height of ⅛ of an inch, allowing it to fall 500 times, then to a height of ½-inch with 500 repetitions, then ¾-inch more in height, and so on until the slab failed. To date about 12 slabs have been tested, laid on a rather wet subgrade. A surprising difference has been found in the strength of the different types of pavements tested. The total number of blows required to cause failure have varied with the different slabs from 67 up to almost 2 000. All these data promise to be of the greatest value to engineers in selecting material for roads of various types.

## Relative Wear of Different Pavements.

The Bureau of Public Roads is also making a study of the relative wearing qualities of different types of pavements and tests have been about completed on a short section of pavement containing 49 different types subjected to the wear of a special truck equipped with five large cast-iron disk-like wheels. The relative wearing qualities of hard as compared with soft brick are brought out very distinctly in this test. The resistance to wear of various kinds of stone block sections is also shown up to good advantage. A chance to compare grout and asphalt fillers for both brick and stone block is furnished by this investigation. Likewise, the relative wearing qualities of concrete when mixed with various kinds of coarse aggregates is indicated.

## Investigation of Subgrade Materials.

The investigation of subgrade materials started a few months ago with the cooperation of the District engineers and State engineers is proceeding at a very satisfactory rate. A number of samples have been received from various parts of the country and laboratory analyses of many of these samples are partially completed. The methods being used by the Division of Tests will shortly be published as a paper so that any other laboratories wishing to conduct similar investigations may have some guide as to the method of procedure being followed by the Bureau of Public Roads.

The samples analyzed have been taken from parts of the roads that have failed very badly as well as from adjacent parts of the same roads that have

Approx.		Pneumatic		
Speed	Height	Old Tire	New Tire	Tire
5.7	2"	11,600	9,400	7,100

withstood heavy traffic successfully. It is hoped that by a comparison of the laboratory results on these samples with the reported behavior of the road in service differences in the subgrade materials will become apparent so that we will be able to say what physical characteristics soils must possess to give them high bearing value.

#### **Status of The Spanish Cement Market.**

Spanish manufacturers control the local cement market, as price is the chief factor. Quality is of small consideration to the Spanish buyer of cement though he may concede the superiority of American cement. It is therefore obvious that unless the American product can be delivered in Spanish ports to sell at a lower price than the native product, no business can be done, with the possible exception of fine white cement for special purposes.

Cement is sold in Spain in 50-kilo sacks and in barrels of 150 kilos gross and of 180 kilos gross, the latter being the American export size. The net weight is about 10 kilos less in both cases. In Corunna the 150-kilo barrel is the common unit, and at present its selling price is around 27 pesetas, or at present rates of exchange about \$4.50. The depreciation of the Spanish peseta, now about 6.02 to the dollar, is an adverse factor, but not of great importance in this case.

The ocean freight rates from American ports to Spain appear to constitute an insuperable barrier to the placing of American cement in the Spanish market. The rate on cement from New York to Corunna for quantity shipments, is now approximately \$5 per 180-kilo barrel. Even if this rate was reduced more than half it would not change the situation. It is believed that the selling price of Spanish cement could readily be cut 30 per cent to meet competition if necessary, which would make the price here about the same as in the United States at present. In time the Spanish product will naturally, with increased production and improved methods, decrease in price to some extent.

Cement is one of the Spanish industries which has been greatly benefited and augmented by war conditions. The pre-war importation from Belgium and England, which at Corunna averaged 2,500 metric tons annually, ceased during the war. Those countries have no surplus over their own needs to export at present, and are not a factor in the Spanish market, which it is estimated can now be easily supplied by the Spanish manufacturers. In 1919, 3,104 metric tons of cement were landed by sea from other Spanish ports, principally Bilbao and Barcelona.

There are some 12 brands of cement produced in Spain, the leading ones being "Asland," "Cangrejo," "Ancora-Rezola," and "Hercules." The principal

centers of cement production are Barcelona and Bilbao. The leading Spanish company is the "Compania General de Asfaltos y Portland 'Asland,'" which is responsible for 40 per cent of the Spanish production, operating three large plants, and capitalized at 14,000,000 pesetas (\$2,700,000 at normal rate of exchange). In 1919 this company produced and sold in Spain 86,154 metric tons of cement.

It is stated that this company is not producing more than half the capacity of its plants, so that it is evident that the normally growing market for cement in Spain will be met without recourse to importation.

#### **Safety, First, Last, and All The Time.**

The safety precautions which have long been an outstanding part of the regular policy of the Aberthaw Construction Co., Boston, Mass. have resulted in a continually increasing discount earned by that Company in its compensation and liability insurance, until today the Aberthaw Company has, by far, the highest rating in that respect which any construction company has ever earned in the states of Connecticut, Maine, Maryland and Rhode Island. This discount rate is 52% as compared with the 44.1% earned last year in Connecticut and Massachusetts. It is said that the highest previous discounts were 17.1% in Connecticut and 12.1% in Massachusetts.

It will be understood from the above that in the four states mentioned, the insurance payments by the Aberthaw Construction Co. on work in progress will be only \$4.80 for each thousand dollars of payroll, whereas other companies not earning a discount because of less security from accident have to pay the full \$10.00 rate. As the insurance represents approximately one per cent of the total cost of the building, this saving is seen to be about one half of one per cent of that total cost.

In days of mounting costs and uncertain conditions such as have been with us for many months past, any movement in the downward direction is extremely welcome, and under the system followed by the Aberthaw Co. all savings of this sort result to the advantage of the owners of the buildings under construction. There is much more to it, however, than the mere pecuniary advantage which owners enjoy, for the effect of decreased accidents is a very potent psychological influence, and one which is welcomed whenever it makes itself manifest.

The rules and regulations under which Aberthaw foremen and workmen operate are laid down rigidly in a "Green Book," which is the magna charta of the organization. These specify in much detail and with sketches, where necessary, the requirements of the Company in a great many respects, but particularly in connection with safety of operation.

# Causes of Failure of Concrete in Fire

**F**IRE in the reinforced concrete skeleton frame warehouse of the Imperial Tobacco Co., Norfolk, Va., in June last year left a mass of wreckage and a study of that wreckage has brought forth two interesting documents—one the report of A. M. Schoen, Chief Engineer, South Eastern Underwriters' Association, after an investigation of the disaster, the other a memorandum accompanying the report as sent recently to members of the National Board of Fire Underwriters by Ira H. Woolson, Consulting Engineer for the Board.

Concluding a detailed report Mr. Schoen says:

Possibly no building of so-called "fire-resistive" construction containing large values, that has been destroyed by fire, has offered more instructive lessons in the dangers to be apprehended from poor construction and photographs were taken with a view to bringing out the weaknesses that led to this very heavy fire loss.

Unquestionably reinforced concrete can be mixed and moulded to form the highest type of fire-resistive building, but the various items essential to such construction must be accurately and thoroughly met. These are primarily, of course, proper engineering designs, based on the calculation of stresses and strains to which the building may be subject under extreme conditions, and the provision of suitable factor of safety, resulting in the determination of the size and shape of steel reinforcements to be used and the forms of columns, beams, girders and floor slabs. This and the determination of the proportions of cement, sand and rock, as well as their character and test, are strictly matters for the designing engineer, and can be readily checked at any time from the blue-prints and specifications kept on record. The mixing, hydrating and pouring, however, are in the hands of the builder, and in a completed building no record of these can be obtained. Consequently, the only protection against improper and unsafe work in this direction lies in careful inspection by competent inspectors while the work is under construction.

Mr. Woolson says in this memorandum:

The building was principally of reinforced concrete and in its design and construction appears to have violated nearly all the fundamental requirements for a first-class structure of its type.

The placing of reinforcement was bad and its protection frequently deficient. The quality of the concrete was poor. Some of the coarse aggregate was too large to permit proper distribution among the reinforcement bars. The mixing was carelessly done as evidenced by the fact that in places there

was a larger surplus of sand and elsewhere of stone. Proper care was not exercised to insure continuity between concrete deposited at different times, and the appearance of the concrete also clearly indicated that some of it was deposited too dry and other portions too wet.

With these evidences of bad workmanship apparent and reasoning by analogy, it would not be surprising if the proportioning of all the concrete ingredients were faulty. Unfortunately this could not be ascertained.

In addition to the foregoing and other imperfections in the manufacture of the building, it possessed several other defects which seriously increased its fire hazard. Open stairways and elevators throughout the building transgressed a basal principle of fire prevention, and the imposition of a wooden constructed story enclosed with sub-standard brick walls over the roof of the original building, and having a large exposure of thin glass in a wooden monitor was an inexcusable folly.

The point of all this is that there was a complete collapse and large financial loss when the building generally accredited as high-class construction and a comparatively safe risk, especially as regards the structure itself, was attacked by fire. This fact involves a lesson which the National Board of Fire Underwriters believes should be vigorously impressed upon the minds not only of the insurance companies for whom these reports were prepared, but also upon the owners of such buildings, the architects who design them, and the constructors who erect them.

Considering the combustible contents, the lack of sprinkler equipment and the absence of protection to vertical openings, it was a foregone conclusion that this building would suffer a complete burn-out if a fire in any story were to get beyond control. These conditions were doubtless recognized by the insurance inspectors who examined the building and the risk was probably hated accordingly, but no such inspection of a completed building could have disclosed the fact that it was so inherently weak in its composition that destruction of its contents by fire would cause a complete disintegration of the whole structure.

The important thought accentuated in the report, and which we desire to emphasize, is the absolute necessity for continuous competent supervision of reinforced concrete buildings during erection to insure that all details of safe construction are properly observed by the workmen. The Building Code of the National Board of Fire Underwriters directs

particular attention to the necessity for such inspection in Section 161 which reads in part as follows:

Inspection. Every reinforced concrete building shall be erected under the constant supervision of a reputable and competent inspector furnished by the owner or architect, and acceptable to the Superintendent. It shall be the duty of the inspector to keep a daily record of the work done, to observe whether the materials employed, and the methods of construction, are in all respects in accord with the specifications filed with the Superintendent, and the requirements of this Code; and to make record of all variations therefrom. A copy of these daily reports shall be filed with the Superintendent, who is empowered to stop any improper construction until its faults are corrected, or to cause the removal of any defective work which he may consider dangerous.

A well constructed concrete building should not fail as this one did, and every time such a disaster occurs it casts an undeserved slur upon that type of construction. This should stimulate all conscientious architects and builders interested in it to use their influence to compel competent inspection during construction not only as a safeguard for the owner, but as a protection to their own business reputation.

If insurance companies who are asked to assume the fire risk on such buildings could be furnished a report indicating competent inspection during erection, and certifying that the plans and specifications had been properly executed, it would go a long way toward removing doubt and the tendency to penalize which otherwise is liable to exist.

The importance of this matter has been frequently overlooked in the past, and it is high time that it should receive serious recognition. The expense of such inspection would add a very small percentage to the cost of the building, and it should be considered just as legitimate a cost item as the construction of the roof.

Quite apart from any advantage accruing to the owner or insurance interests from such inspection, the general public safety and application of the principles of conservation should demand that every municipal building code contain a clause similar to the one herein quoted requiring such building supervision.

It should not be inferred, however, from the foregoing arguments that reinforced concrete buildings are the only ones which require such inspection. Bad workmanship is just as liable to occur in other types of buildings, and the necessity for watchfulness in them is also important. The integrity of a brick wall subjected to fire depends more upon the quality of the mortar used, the proper bonding of the brick, and the filling of voids in the middle of the wall with mortar, than upon uniformity in quality of

the brick, although the latter is important. Defects of this character would not appear in a finished wall and there many other places where seriously defective construction would be hidden from view in a completed building.

With the existing tendency toward careless and indifferent workmanship in general, the obligation for supervision is imperative in all important building work.

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#### Engineering Companies Consolidate.

The Austin Machinery Corporation announces the consolidation of the plants of the F. C. Austin Machinery Co., Inc., of Chicago; Linderman Steel & Machine Co., at Muskegon, Mich.; Toledo Bridge & Crane Co., of Toledo, Ohio.; Municipal Engineering & Contracting Co., of Chicago; and F. C. Austin Drainage Excavator Co., at Winthrop Harbor, Ill. The combined energy and capacity of these organizations and plants will be devoted to mass production and to supply a complete line of earth-moving and concrete-mixing machinery to meet an unprecedented period of construction, good road-making, reclamation, excavation and irrigation. Distributing points will be extended throughout the world to facilitate the service and distribution of this broad line of contractors' requirements.

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#### Sand and Gravel Men Organize.

The Georgia Sand & Gravel Producers' Association was organized at a meeting held in Atlanta Sept. 15, and the new organization will affiliate with the national association of sand and gravel men.

The following officers were elected; O. A. Nix, Junction City, president; Albert Meyer, Atlanta, vice-president; R. R. Johnson, secretary, Atlanta; J. W. Waterman, Atlanta, treasurer; J. L. Chevis, Zenith, chairman committee on by-laws.

The association is subject to call by the president, and another meeting probably will be held soon.

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#### Engineers' National Conference on Employment.

On November 12, 1920, in Chicago a National Conference on Engineering Employment will be held under the auspices of the American Association of Engineers. All employment managers of the large industries are expected to attend and participate in the solution of industrial relations problems affecting members of the engineering profession.

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#### Meeting of American Engineering Council.

There is to be a meeting of the American Engineering Council of The Federated American Engineering Societies at the New Willard Hotel at Washington this month. This is to be the first meeting of this body and a very interesting three-day pro-

gram has been arranged. The first session will be held on the morning of November 18. The program follows:

8:30 A. M. Registration.

10:00 A. M. Opening Session of American Engineering Council.

1. Call to Order.  
Richard L. Humphrey, Chairman,  
Joint Conference Committee,  
Consulting Engineer,  
Philadelphia, Pa.
2. Election of Temporary Chairman.
3. Election of Temporary Secretary.
4. Appointment of Temporary Committees:
  - (a) Program
  - (b) Credentials
  - (c) Constitution and By-Laws.
  - (d) Nominations
  - (e) Plan and Scope
  - (f) Budget
  - (g) Resolutions.

#### Afternoon Session.

- 2:00 P. M. Address—"Engineering Council,"  
J. Parke Channing, Chairman, Consulting  
Engineer, New York, N. Y.
- 2:30 P. M. Discussion of the field of activity  
for The Federated American Engineering  
Societies.

#### Friday, November 19.

##### Morning Session.

- 9:00 A. M. 1. Report of Committee on Nomi-  
nations.  
2. Election of Permanent Officers.  
3. Report of Committee on Consti-  
tution and By-Laws.  
4. Formal Ratification of Consti-  
tution and By-Laws.  
5. Report of Committee on Plan  
and Scope.

##### Afternoon Session.

- 2:00 P. M. 1. Report of Committee on Budget.  
2. Report of Committee on Resolu-  
tions.

##### Evening Session.

- 8:30 P. M. I. Introductory remarks by presid-  
ing officer, the President of  
American Engineering Council.  
2. Address .....  
Herbert C. Hoover, President,  
American Institute of Mining and  
Metallurgical Engineers, New  
York, N. Y.
- 9:30 P. M. Informal reception and smoker.

#### Saturday, November 20.

9:00 A. M. Organization Meeting, Executive  
Board, American Engineering Coun-  
cil, of The Federated American En-  
gineering Societies.

#### Agricultural Engineers at Memphis.

The Southern Section of the American Society of Agricultural Engineers held a two-day meeting in Memphis, Tennessee, on August 30 and 31, devoting its attention to agricultural engineering problems as they are found in the South. Representatives from practically all of the southern states were in attendance, the agricultural colleges being particularly well represented. At the business session Stanley E. Morse, a consulting agricultural engineer of New Orleans, was elected president of the Section succeeding E. R. Gross, of Mississippi Agricultural College. James Arontson, of Memphis, will be vice-president and Charles E. Seitz, of Blacksburg, Virginia, will be secretary and treasurer.

The papers presented included: "How to Improve Sanitary Conditions in the South," by H. R. Herndon, Portland Cement Association, Dallas, Tex.; "Plantation Management," by President-elect Morse; "Terracing as a Soil Saver," by H. B. Bliss, Tennessee Agricultural College; "Methods of Conducting Drainage Extension Work in the South," by S. N. McCrory, Engineer in charge of Rural Engineering, Washington, D. C.; "Dynamiting," by P. H. Williams, Memphis; "Farm Machinery Situation in the South," by F. R. Jones, Knoxville, Tennessee; "The National Retail Hardware Association and the College Agricultural Engineers," by Herbert Sheets, secretary and treasurer of the Retail Hardware Association; "Agricultural Engineering Experimental Work," by F. D. Cotrell, Mississippi Agricultural and Mechanical College; "Agricultural Engineering Instruction," by Daniel Scoates, Texas Agricultural and Mechanical College; "Instructive Work in Agricultural Engineering," by E. R. Gross, Mississippi Agricultural and Mechanical College.

The closing afternoon of the meeting was devoted to inspection of the experimental work being carried on under the supervision of C. E. Ames, assistant director at the branch experiment station at Holly Springs, Mississippi. These experiments have to do with reclaiming and conserving land by the use of terraces in connection with certain special devices for preventing erosion.

#### Breakink Up Concrete Foundations With Dynamite.

In enlarging the power plant of the International Corporation of Mulberry, Fla., some heavy concrete foundations for boilers and a 175-ft. stack were installed. After the concrete had been allowed to set for about four weeks it was found that the boiler foundations had soft spots in them, and accordingly

it was decided to tear out the concrete and rebuild. The stack foundation also was condemned. The narrow boiler foundation walls were easily removed but the stack foundation was a more difficult problem. This foundation was of concrete 7 ft. deep, and poured in three runs. The bottom was 22 ft. in diameter, second pouring 17½ ft., and third or top pouring 16 ft. It was proposed to blast out the concrete with dynamite, but great care had to be taken in doing this as within 50 ft. of the foundation there was a million dollars Diesel power plant and 15 ft. away a \$20,000 hoist, which could not be moved. New boilers and their fittings also were scattered around.

Holes were drilled 30 in. deep and 30 in. apart (staggered) for the first blast. This depth took holes just 2 in. below level of last pouring. These

holes were loaded with ½ lb. of 40 per cent straight dynamite and fired electrically. Straight dynamite was used on account of its quicker action so as to get this splitting between layers and between holes.

Excellent results were obtained from this shot, the concrete breaking in blocks on the 2-ft. 4-in. level and between holes and was easily lifted out with the steam hoist. The second holes were drilled 2 ft. deep (staggered). The depth of these holes was increased so as to penetrate the first layer 6 or 8 in., to get a shattering effect on this bottom layer to as great a depth as possible without breaking through. The blast broke the second layer nicely and shattered the bottom layer to about half its depth.

Before each blast was fired, the foundation was carefully covered with heavy timbers and these anchored with railroad ties to prevent any of the blasted material from getting away.

## Colored Concrete and Stucco

ADOLPH SCHILLING, Before National Convention Concrete House Construction

**T**O PRODUCE color effects, we may use gray or white portland cements, either by themselves, or mixed in certain proportions, adding to this suitable pigments, but in many cases, the natural colored aggregates, sand, silica, pebble grits, marble and granite, will give excellent and more uniform results. It requires great skill and care to properly mix cement and color pigments without reducing the strength of the cement and still obtain uniform color effects.

The importance of mixing the pigment thoroughly with the cement, before adding the aggregates, should be understood by anybody attempting to make concrete in colors successfully on a large scale.

As a very simple method to test the proper amalgamation of the pigment with the cement, take a handful of the dry mixture, and press it under a sheet of stiff paper, this will produce an even surface of the material, and as long as this surface does not show absolute uniformity in color, the mixing is incomplete. If small specks of color show on the surface under this test, these same specks of unassimilated pigment will appear in the concrete. So far a very important factor that can be utilized for coloring concrete or cement has been given little or no attention, while very simple in its primary action the successful application requires thorough understanding of the principle and medium employed.

The absorptive qualities of concrete during its stage of curing and seasoning offers opportunities

for coloring concrete products by capillary action. By this method the color is deposited into the pores of the surface, amalgamating with the concrete into a permanent unit. The possibilities of this treatment are unlimited, based on knowledge of coloring values and good judgment not to impair the strength requirements of concrete. Coloring solution can be made to penetrate the surface of concrete six inches or more, if the object is immersed while in a very green state, but it is rarely necessary to penetrate more than 1/32 to 1/8 of an inch. This thoroughly fills all pores, gives the desired color effects and is less expensive. Every atom of coloring absorbed by the concrete reduces the strength of the solution; and as some of the coloring matter used is quite expensive, good judgment in allowing only the necessary absorption of coloring matter would be advisable from an economic standpoint. The sulphates of copper and iron are the most suitable to make solutions to color concrete by the capillary method.

The concrete to be colored can be treated after it is a week old. Concrete products used in construction and carrying loads should not be subjected to the coloring bath until the concrete has attained its required strength; as the filling of the pores in the concrete retards the action of curing by the usual methods. Coloring by absorption is effective on surfaces of concrete after it comes out of the mold, or after being treated with tools. Surfaces that have been colored by absorbing mineral or metallic colors, become more weather-proof and the ac-

tion of the weather on the metallic colors is the same as on real metals, increasing the beauty of coloring by the usual oxidization noticed on bronze and copper. The surfaces of concrete treated by this method become so hard and dense that they will take a polish. I have treated such surfaces in the same manner as marble, granite and metal under polishing or buffing machines.

Our products made by wet cast methods, such as flower pots, vases and boxes, will hold water after the second day of casting and become so hard that when struck with a hammer, they ring like a metal bell; waterproofing compound helps, but it not essential to obtain this result. I consider that the thorough mixing of the proper amount of cement and water with graded aggregates is all important. Extensive tests made during the past three years with commercial waterproof paints, produced excellent results. Common concrete can be made very attractive by one or two coats and applied in stipple fashion, it will not impair the grain or texture, avoiding the undesirable effect of painted stone. This method is especially to be recommended for dry or semi-dry tamped concrete work, as the porous surface readily absorbs the waterproof liquid, and allows the pigment particles to fill the pores.

The color effect obtained in this manner is the most economical. It is a uniform color but does not give the richness and depth of shading that results by the immersion treatment in a metallic color bath. It has the advantage, however, of being applied where immersion is not practicable. I have obtained two and three-color effects by painting certain parts of an object, before subjecting same to the coloring bath, the parts so colored would not be affected by the color in the bath.

The artistic possibilities of such treatment are only limited by the color sense and taste of the craftsman. Using certain non-absorptive aggregates, their natural color can be retained, while the absorptive parts, especially the cement mortar will assume the desired color. In this treatment precaution must be taken in the use of acids in washing before immersion in the color bath, as the chemical action of the acids is liable to counteract the color values of the bath. Acid should not be employed on concrete treated with colors.

Long practice and tests will give the experience necessary to gain the full benefit of this process; I have spent nearly ten years to obtain the present results.

In the matter of surface finishes, considerable headway has been made, and most of the methods are well known to the progressive concrete man. Any surface treatment is preferable to leaving concrete as it comes from the mold.

### Film Tells Story of Metal Lath.

In order to bring the value, adaptability and general advantages of Metal Lath more vividly to the minds of architects, builders, material dealers, etc., the Associated Metal Lath Manufacturers have harnessed the power of the motion picture to the task of emphasizing these facts. An educational movie which has just been completed by the Rothacker Film Mfg. Co. tells the story of Metal Lath so effectively that all those who view it cannot but be impressed with the worth of this material as a stucco and plastering base of first order.

This film has an interesting journey ahead of it. It will travel all over the country, attending conventions of architects, builders and material dealers. It will make the rounds of the technical colleges so that the builders of tomorrow may start on their careers with a thorough and true comprehension of the nature and value of Metal Lath.

The picture's opening scene shows a dwelling in course of construction. After the frame work has been erected, the metal furring strips are put on. Then the metal Lath is applied and the plaster work is done. Details of the construction of a stucco on Metal Lath home are shown from start to finish, so there can be no doubt in the mind of anyone who views the picture as to the best practices known regarding this type of building. The economy of this type of construction, the fact that it has been shown to be best by test for heat insulation and strength, make a proper visualization all the more important.

Close-ups, showing the stuccoeing of various types of Metal Lath, register in detail how the plaster passes through the strands of steel and takes its firm grip on the far side of the Metal Lath.

The American Concrete Institute in its latest recommendations suggests the use of a basket bent out of Metal Lath and holding incombustible material as a fiber stop at the juncture of floor joists and studding. Actual fire tests and details of construction show how effective this type of fire stopping is and also how easily it can be put into place.

Other scenes tell the great resistance of Metal Lath to distortion by actual test before the building committee of the City of Omaha.

Workmen are shown demolishing a building. The Metal Lath ceiling of a room comes down as a blanket in one piece. The way the removed ceiling resists the assaults of the workmen emphasizes how Metal Lath, after several decades of service, still reinforces the plaster and is in perfect condition.

An actual demonstration of the fire resistive value of Metal Lath construction as compared to unprotected frame construction is shown in one of the concluding scenes of the film. A house—one-half built of wood protected with Metal Lath and the other half of ordinary frame construction—is



set afire under identical conditions. The Metal Lath half, grimly fighting the fire is shown intact long after the unprotected half has burned to the ground.

The motion picture was made under the supervision of Wharton Clay, Commissioner, Associated Metal Lath Manufacturers, Chicago. "We wanted to tell the story of Metal Lath at technical conventions and colleges," said Mr. Clay. "To have erected wall sections for actual demonstrations at these various gatherings would have been an impractical undertaking. Some simply made one perfect demonstration before the movie camera."

### New Jurisdictional Awards.

An interpretation of the procedure to be followed by the parties to a jurisdictional dispute was given at a recent meeting of the National Board for Jurisdictional Awards at the request of the Associated General Contractors.

Jurisdictional strikes need not occur if the parties concerned take the steps prescribed in the Constitution of the Board. In response to questions addressed to the chair by representatives—the Associated General Contractors, the Board announced that it is "the sense of the Board that Article 8 shall be strictly enforced, and that all affiliated organizations be informed that it is unconstitutional to interfere with the progress of the work by a jurisdictional strike until a decision has been rendered by the Board on such questions as may be in dispute."

Elsewhere the constitution provides that "local organizations refusing compliance with the provisions of this Board shall be suspended from their international organization and the international organization shall proceed at once to man the job and the employer shall cooperate with the international organization in so doing."

In the dispute relative to the handling and unloading of material as applied to reinforced concrete construction between the laborers' and structural iron workers' unions, the work of loading, unloading, carrying and handling of all rods and material for use in reinforced concrete construction, and the hoisting of rods, except when a derrick or outrigger is used, was awarded to the laborers.

In the dispute filed under the subject of "pointing and trimming of voids and defects in concrete, the Board assigned a new title to the case, designating it as "defects in concrete caused by leakage, bulging, sagging, etc., through defective or shifting forms." This work, where finishing tools not used or required, was awarded to the laborers. The filling of voids and other work requiring patching, where finishing tools are used and required, was awarded to the cement finishers.

A rehearing was granted in the matter of elec-

trical work on elevators upon the petition of the International Brotherhood of Electrical Workers, who protested the award recently handed down.

A request for an interpretation of a recent decision over pipe railing was referred to the officials of the Board for a statement more illustrative of the decision.

The refusal of the engineers' union to accept a decision of the Board on the subject of low pressure heat was referred to the Building Trades Department of the American Federation of Labor for further action.

All other subjects before the Board were placed on the calendar for the next meeting, which will be held at Washington, D. C., November 29.

The present officers of the Board were unanimously re-elected for another year. They are: chairman, E. J. Russell; vice chairman, William L. Hutcheson; executive secretary, William J. Spencer.

### Says Concrete Ships a Success.

Concrete ship construction was the main topic of discussion at the regular monthly meeting of the Atlanta association of members of the American Society of Engineers, held in Atlanta recently. Victor H. Kriegshaber, president, was in the chair, and the principal speaker was W. C. Spiker, of Spiker & Lose, Atlanta, who served as head of the design section of the Emergency Fleet Corporation branch which experimented with concrete ships during the war emergency.

The meeting was well attended, and the discussion led by Mr. Spiker created a great deal of interest. He said concrete ships were successful; that there was a good chance of them being further developed; as they had proved themselves buoyant and durable. "The main objection to them," continued the speaker, "is that the concrete used is not of the best as yet. It will not stand the shock of heavy collision, because the material is not elastic enough.

"A special kind of concrete was developed, however, which is stronger and more compact than commercial building concrete. Vitrified clay is used instead of sand in its composition, and this aggregate makes the final result smoother, firmer and stronger. The ships were built on especially-made forms into which the concrete was packed and allowed to set. It was reinforced with from eight to ten per cent of steel, which is a larger percentage than is used in ordinary construction concrete.

"I believe that, since commercial contractors are now carrying on the experiments started by the government, concrete ships will be more extensively used," said Mr. Spiker. "They will be cheaper than steel ships, and can be constructed in less time. Moreover, they are almost as buoyant and

much dryer. No water-proofing is used on the concrete, yet the cement in it keeps the interior of the ship as dry as a barn.

"Though the government carried the idea only to the experimental stage, and stopped their work on them when the war closed, the fourteen ships that were built, have proved themselves to be durable, safe and useful."

Numerous questions regarding the construction principles involved were put to Mr. Spiker at the close of his address, and the local engineers also showed great interest in the super-concrete which Uncle Sam's assistants succeeded in developing for use in ship building.

#### 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.

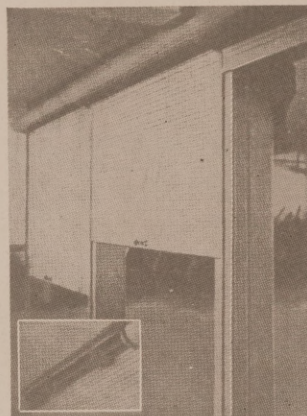
33734.—A mercantile company in Italy desires to purchase cement, iron for reinforced concrete work, and new or second-hand driers for ground pumice stone. Quotations should be given c. i. f. Italian port. Payment to be made against documents. Correspondence may be in English. References.

#### Sand-Lime Brick Production.

The sand-lime brick produced in the United States in 1919, according to an estimate made by the United States Geological Survey, Department of the Interior, amounted to 145,000,000 brick, valued at \$1,725,000, an increase of 47,000,000 brick and of \$841,000 over 1918. The maximum output of sand-lime brick—227,344,000 brick—was made in 1916, but the maximum value was that of 1919.

#### Fights Ruling on Cement Rates.

Cancellation of rates on cement from New Orleans and other gulf ports to other freight territories was opposed by the Jahneke interests, at the meeting of the New Orleans subcommittee of the Southern Freight Rate Committee. It was proposed to cancel the rates, as there are at present no ship-



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ments of cement from the gulf ports.

Walter Jahneke said that with the present prices of cement there is likely to be large importations from Europe, as many ships are coming into New Orleans in ballast. The cancellation of the rates at this time, he said, would work a hardship.

**To Help Solve Material Handling Problems.**

To aid in the solution of engineering problems connected with the handling and distribution of materials and products 400 members of the American Society of Mechanical Engineers have organized a professional section on material handling. It is with a view to reducing the industrial and railroad congestion and the cost of handling various products reflected in high prices that this action was taken. The section will co-operate with technical and industrial organizations in the solution of handling problems.

**Addressed by Mr. Hall.**

At the monthly meeting of the Atlanta chapter of the American Association of Engineers, held Oct. 22, at the Carnegie library assembly room in that city, B. M. Hall, the well-known civil, mining and hydraulic engineer, delivered an address on "Modern Methods of Steam Measurements."

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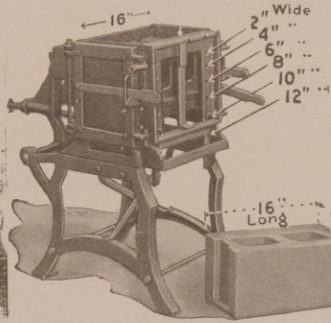
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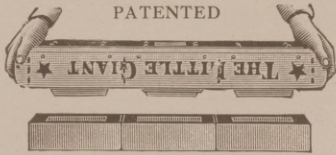
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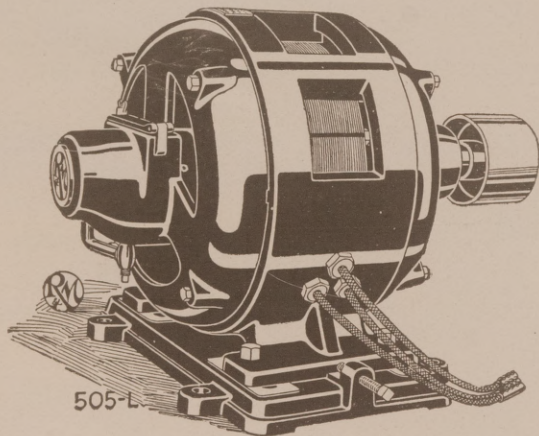
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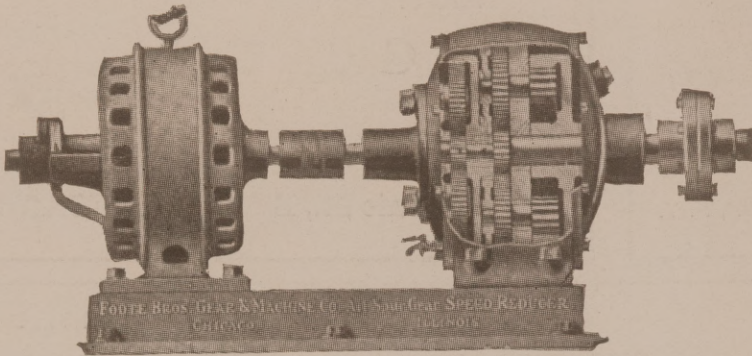
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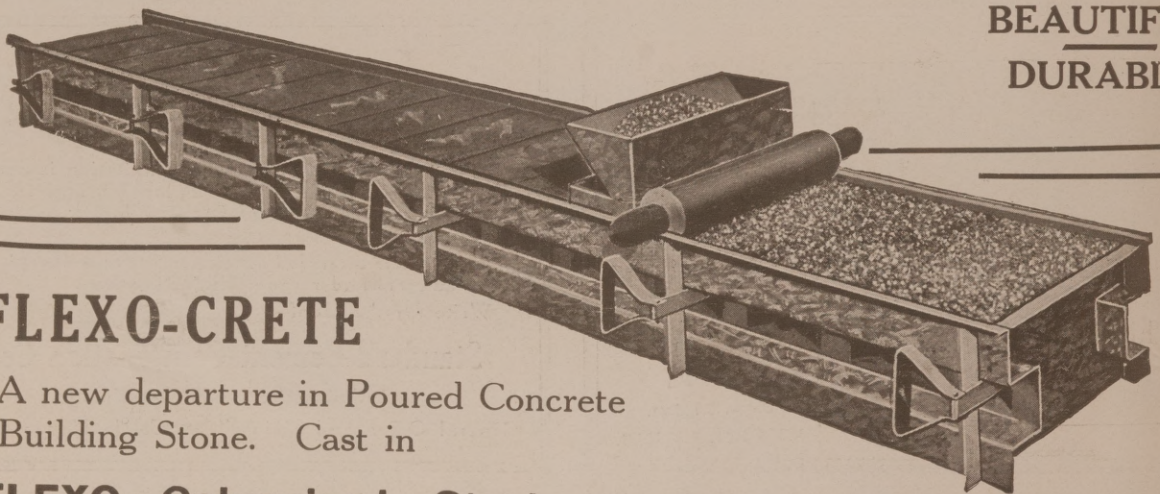
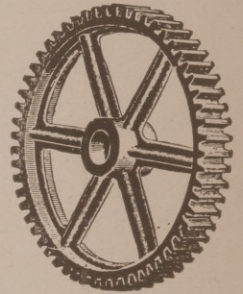
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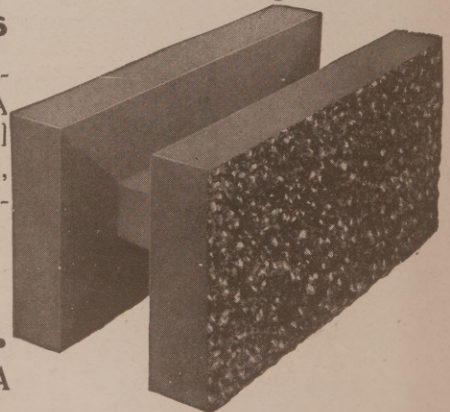
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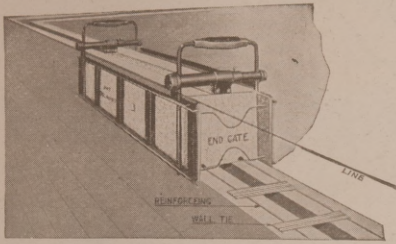
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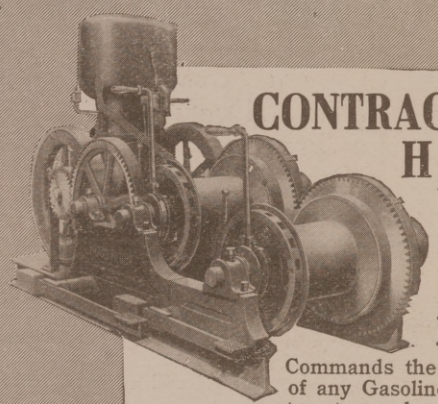
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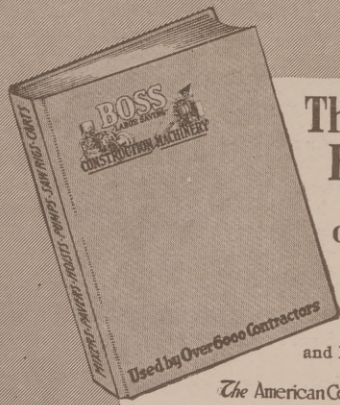
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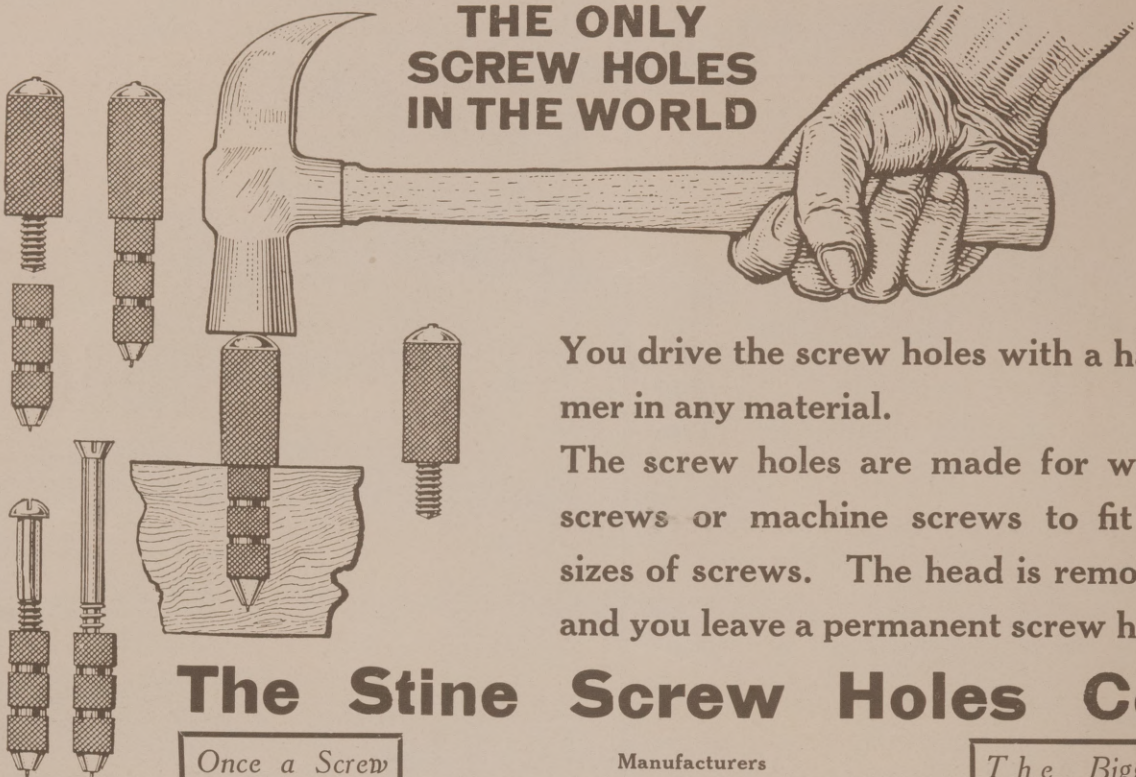
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- 17—This is a progressive Old World of ours, and every active person in it must adopt all improved methods, and all new articles that will help him keep in the front line of progress.
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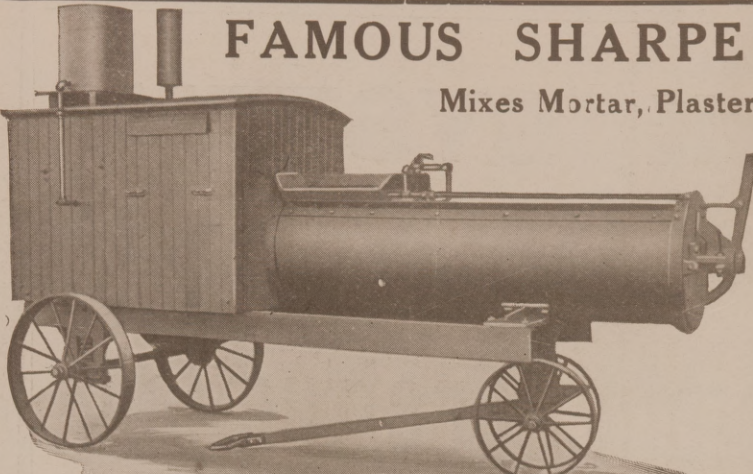
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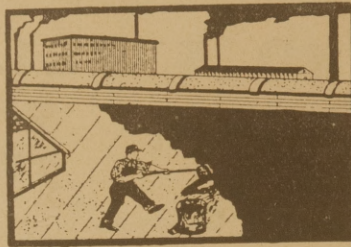
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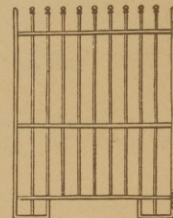
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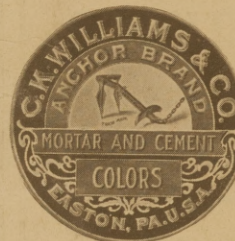
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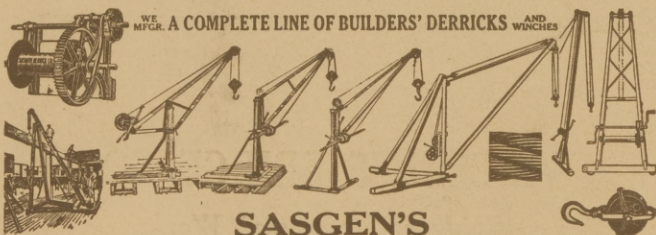
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