

THE CONCRETE AGE

REPRESENTING THE INTERESTS OF MODERN PERMANENT CONSTRUCTION

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VOL. XXXIII. MONTHLY DALTON and Atlanta, JANUARY, 1921. \$1.00 Per Year. No. 4

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.

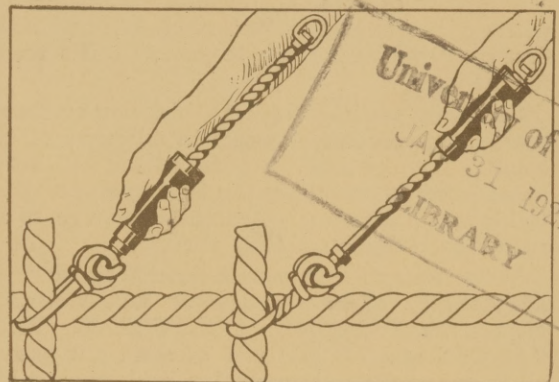
The same molds that form the standard block can be used for pouring the logs. Out in this country, houses built of concrete logs, poured in adjustable metal molds, are mighty popular.

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.

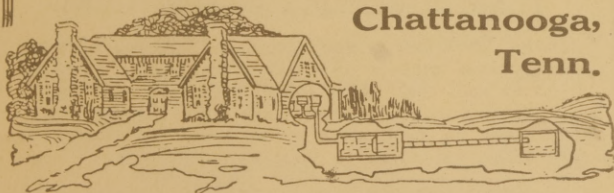
SEPTIC TANKS

Scientifically Designed for Suburban Sanitation.

Write for Circular.

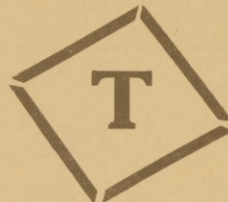
E. J. NOBLETT MFG. CO.

**Chattanooga,
Tenn.**



Alabama Hewn Oak Timber

Trade



Mark

Reg. U. S. A

**THE S. K. TAYLOR LUMBER
COMPANY**

MOBILE, ALA.

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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.

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

Dept. R.

SAUERMAN DRAGLINE CABLEWAY EXCAVATORS

are widely used in developing local deposits of road gravel

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

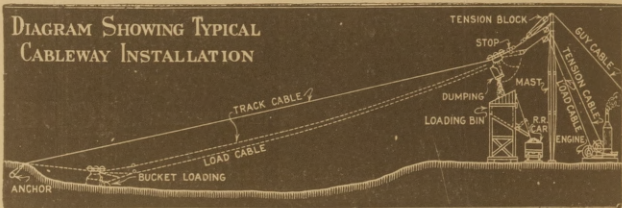
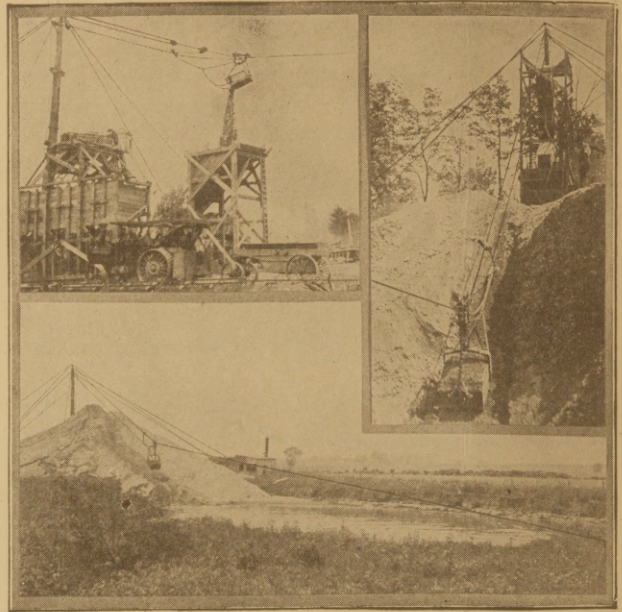
Sand and gravel producers, highway contractors and road commissioners in all parts of the country have proved the great saving which can be affected by installing the Sauerman Dragline Cableway Excavator when materials are to be rushed for a big job of road work.

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.

SAUERMAN BROS.

1136 Monardnock Block, Chicago, Ill.

Cableway Excavators Cableway Accessories
Power Scrapers



SILO HARDWARE

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

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

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

A trial order will convince you.

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

We can furnish any quantity

SILO Rods
Lugs

Wood or Steel
Doors

Door Spreaders
Reinforcements
Reinforcing Steel,
Twisted or
Deformed

Galv. Iron Chutes
Metal Roofs
Cement Stave
Machines,
Moulds, Etc.

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

ART WORK IN CONCRETE

Start a Business of Your Own.

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

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ART STONE CO.

WAYNESBORO, PA. Lock Box 400

Here is a Glazing Composition that will



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

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

KUHLS'

ELASTIC GLAZING COMPOSITIONS

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



H. B. FRED KUHL'S

Sole Manufacturer

415 Third Ave. BROOKLYN, N. Y.

Bale Your Empty Cement Sacks

WITH A
ROWE SACK BALER



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

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

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



A TYPICAL CONCRETE HIGHWAY

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

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

Dixie Portland Cement Company

James Building, Chattanooga, Tenn.
CONCRETE FOR PERMANENCE.



Clean Your Sacks Handy Sack Baler Co.

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

Write us.
Handy Sack Bailer Co.
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Cedar Rapids, Iowa

Machinery Covers are cheap insurance

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

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

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

An ounce of covering is worth dollars in repairs.

UNITED STATES TENT & AWNING CO.

227 N. Desplaines St. Chicago, Ill.



Buy Kramer Equipment

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

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

Investigate. Prices on request.

Kramer Automatic Tamper Co.

Kelley Street, Peoria Heights
PEORIA, ILL.

Quality Higher Than the Price

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

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

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

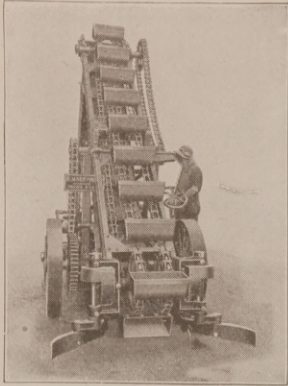
We furnish a complete outfit with each machine for making Rock or Plain face blocks.

Our Prices will surprise you. Send for Catalogue today.

BURRELL MFG. & SUPPLY HOUSE

Box Y-86 Kankakee, Ill.





AUSTIN Self-Feeding Wagon Loader

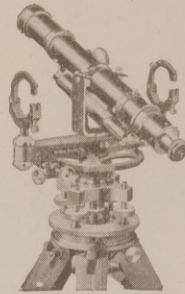
Not a so-called self-feeding loader, but a real labor saver for rapid and efficient handling of material in concrete road and building construction, excavation work, quarry, storage and reclaiming plants and coal and material yards.

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

F. C. AUSTIN MACHINERY CO.

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

No Up-to-Date Builder



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

"STERLING" CONVERTIBLE LEVEL

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

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

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

Vest Pocket Manual of Adjustments Free.

Wet Mix Concrete Men, Attention!

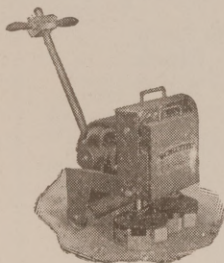
"McAdamite" is something new. Nothing like it on the market. Absolutely prevents cement from sticking to the forms and product comes out with a smooth, glossy surface, resembling the work of a trowel. Saves more than the price of other oils in labor. Gallon lots \$1.25 per gallon. Five gallons or more,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

McADAM CEMENT WORKS

315 E. 5th Street

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The IMPROVED Rapid Floor Surfacer



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

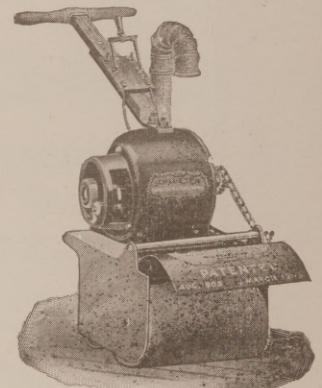
Send for our free trial offer.

M. L. SCHUETER

221 W. Illinois St.

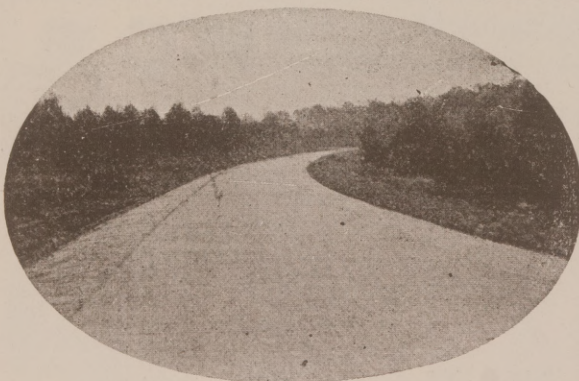
CHICAGO, ILL.

Phone Main 2349



Made in several sizes.

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



Dustless—Non-Slippery—Always Serviceable—Lowest Maintenance

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

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

Concrete Practically Eliminates Maintenance.

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

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

Standard Portland Cement Company

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



WINTERPROOF!

Winter's rough weather—rain, hail, sleet, snow—a freeze one day, a thaw the next—makes no impression on buildings and businesses protected by

The Starks Line

WATERPROOFING {
 CONCRETE
 CEMENT
 BRICK
 STUCCO

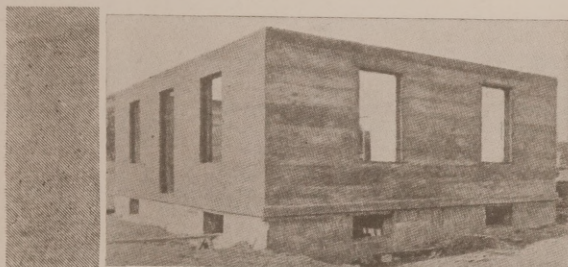
Write or Wire for Prices.

We Want Wide-Awake Jobbers.

The Starks Manufacturing Co.

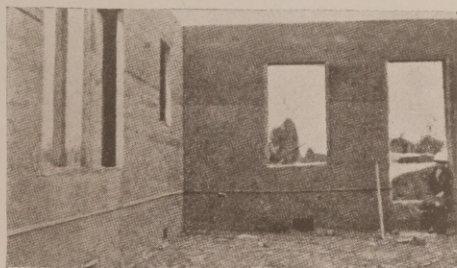
First and Main Sts.

Kansas City, Mo.



ACME

Hollow Wall System

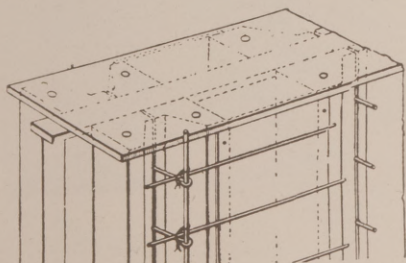


Speed and low-cost in building hollow walls—your bid low enough to get the business—high enough to make good money—and the speed gets you away to the next job in a hurry. That's how the Acme System works.

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 PHILADELPHIA IRON NEW YORK WORKS EDDYSTONE

ENGINEERS—CONTRACTORS—EXPORTERS

STRUCTURAL STEEL

COMPLETE INDUSTRIAL BUILDINGS

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

CABLE ADDRESS
"BELIRON"



NEW YORK OFFICE
15 PARK ROW

Code Western Union
fire letter addition.

Illustrated atalog in English, French and Spanish
mailed on request.

Complete Warehouse Stock of Structural Shapes and
Plates for Immediate Shipment

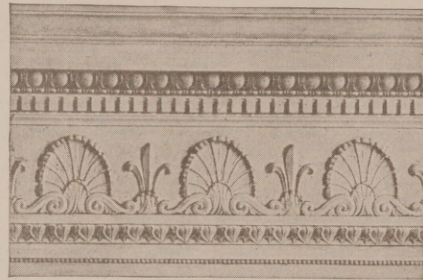
Pipe Couplings

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 moldings and ornaments. Let us estimate on all your plastic relief and composition work. Let us lay before you more clearly the character of our work.

Multiple Oval Cores allow use of Wet Mixed Concrete

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

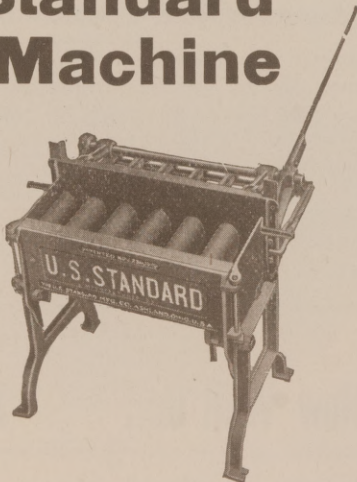
Our coring system allows for plenty of wall ventilation giving air space from top to bottom of wall.

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

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

U. S. Standard Block Machine

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



U. S. Standard Manufacturing Co.

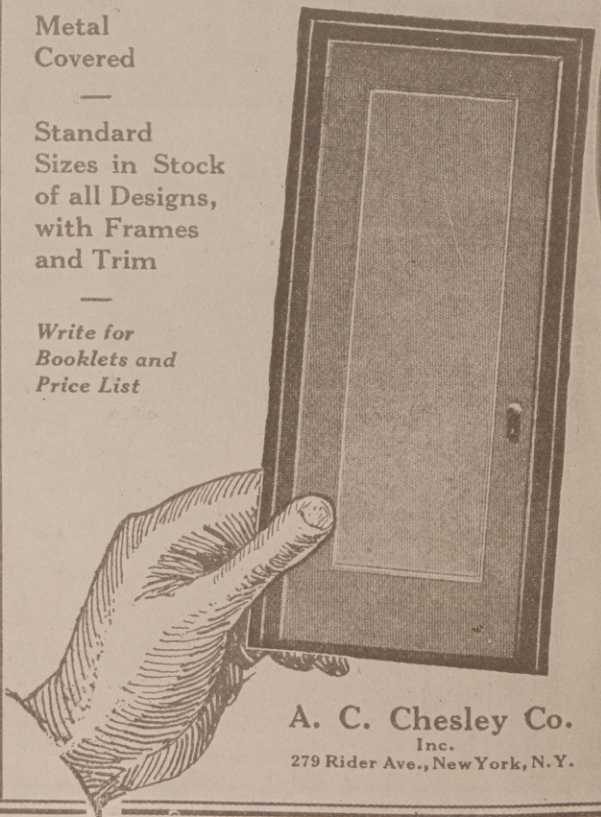
Formerly of Ashland, O.
Columbiana, Ohio

STOCK FIRE PROOF DOORS

Metal Covered

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

Write for Booklets and Price List



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

THE CONCRETE AGE

DALTON and Atlanta GEORGIA

VOL. XXXIII. JANUARY, 1921. No. 4

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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Planning for New Year.

The New Year, with its infinite promise of business activities and prosperity along safe, normal and substantial lines, looms just ahead. The month of November, with its marketing, its busy trading and its general commercial activity; still greater activity during a portion of December, and also the working out in more definite detail of the plans for the New Year; a few days in which the holiday spirit will take possession of the country, and make us forget our cares and troubles—you know, reader, staid and rather dignified though you may be, how the Christmas spirit just gets into your blood; and then—1921! It's almost here; the cheery young man will be bowing his breezy way in before we half realize it.

Now is the time to lay your New Year plans. Lay the foundation broad and deep, in confidence and faith. America is the world's one best bet. The commercial opportunities here will be—enormous. They will be grasped—there is no doubt about that. The courage, the resourcefulness and the enterprise of the American business man have never failed him yet.

For Road Construction.

The Bureau of Public Roads, United States Department of Agriculture, has compiled the monthly report for the southeastern district over which it has jurisdiction, showing that from the inauguration of federal aid work in Alabama to November 30 Alabama projects statements amounted to \$4,053,389 and project agreements to \$1,970,228. Amount paid out by the federal government on these projects totaled \$609,947.

The report for the district was as follows:

Project statements: Florida, \$2,264,857; Georgia, \$6,373,933; Mississippi, \$2,931,677; South Carolina, \$2,461,063, and Tennessee, \$4,738,530.

Project agreements: Florida, \$1,476,917; Georgia, \$4,440,892; Mississippi, \$1,741,783; South Carolina, \$1,643,134, and Tennessee, \$2,870,580.

Paid out on construction: Florida, \$272,700; Georgia, \$1,899,754; Mississippi, \$479,002; South Carolina, \$447,682, and Tennessee, \$307,898.

Hauling Road Materials.

Mr. Roy G. Owens, vice-president of The Lakewood Engineering Co., Cleveland, O., makes the suggestion that road-building materials should be transported and stored at point of consumption during the fall, Winter and early Spring months, thus facilitating the construction of highways. Supporting this suggestion, Mr. Owens writes:

"Open top cars are more available during these months than when coal and harvest movements begin. Contractors having materials on hand when the season opens next Spring will go to production without facing expensive delays incident to the railroad congestion or car shortage.

"The railroads would profit by increased efficiency from available rolling stock.

"The people would benefit through thus aiding in the solution of the general transportation problem which has so much to do with our present failure to supply demand at points of consumption.

"Banks and business would obviously benefit by the credit thus released."

There is much in the suggestion Mr. Owens makes. There is also an expression in his letter which calls to mind in a pointed way a certain advantage we enjoy here in the South. He says, "when the season opens next Spring." Here in the South road-building proceeds the year-round.

Let Highway Contracts Early.

With the experiences of this year in mind one would expect that highway engineers would plan to let their next season's contracts early. Inquiry, however, indicates that such is not the case. Only here and there is next season's program determined. The reasons given vary. In some cases the departments are waiting for lower prices and will not determine their programs until the decreases appear. In other cases, no reasons are given. If departments propose to do work next year, they should definitely arrange to invite bids in January and February. That requires that the program be at once determined and the letting details be taken in hand. What important decrease there may be in prices will probably materialize by Jan. 15. Early letting not only will insure an early spring start, but will allow materials to be put on the ground in advance and will give the material producers and equipment manufacturers early warning of what the road program will demand of them. If work is to be done at all next year, wisdom demands early letting. Lower prices secured by delay are likely to be offset by losses due to inability to get the work done within the season's limits.—Engineering News Record, New York.

Not The Government's Business.

Senator Kenyon, of Iowa says that this country is short nearly 2,000,000 homes and that 15,000,000 people are not properly housed. He wants a home-loan bank established by the government on the lines of the farm-loan bank, to aid people in building homes. The truth is that there is no money in building homes or owning them. Taxes and other expenses have risen so frightfully that home-owning is heavily penalized. All sorts of severe laws and rules have been adopted, so that anyone who owns a piece of property is put almost in the criminal class. If the people of this country want more homes, the way to get them is very simple. We have seen a great many people who wanted homes, and they got them. But they didn't get them by sitting down idly and waiting for someone else to bring the home to them. Maybe the government will provide homes for everybody, but we shall not believe it till we see it.

Cement Prices.

The following comes from Chicago, dated December 3rd:

"Price reduction from \$2.50 to \$3.00 f. o. b. mill to \$1.98 to \$2.25 f. o. b. mill were announced by three cement companies having mills in Illinois, Michigan, Tennessee and other states.

At present there is cement available in any quantity for building, according to officials of cement companies in this city, with almost immediate delivery.

Cement Prices Firm and Production Heavy.

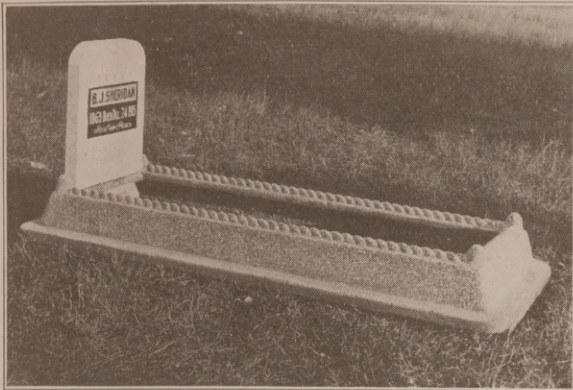
The country's production of cement this year estimated at about 95,000,000 barrels, is short of the actual requirements by a considerable margin, according to John A. Morron, president of the Atlas Portland Cement Co.

The principal factors hindering production have been labor troubles and coal shortage, but conditions have recently improved. Prices of coal have dropped and delivery is more certain, although many mills have not made contracts for next year's supply owing to unsettled conditions. However, prices of cement will probably remain at near their present level for many months, probably well into 1922, and no over-production of cement is anticipated for 1921; in fact, indications now point to a scarcity of it.

Associated Contractors Meet Jan. 26.

The Second National Conference of the Associated General Contractors of America has been called to meet at the Grunewald Hotel, New Orleans, January 25th-27th.

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

The Henry Airtight Weatherstrip
(Automatic)

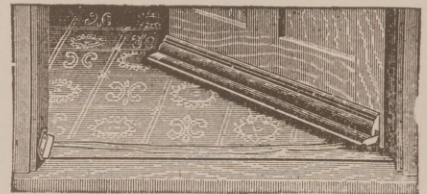
for the bottom of doors and hinged windows. It's automatic. Fits down tight against worn sills as well as new ones. Keeps out every bit of cold, snow and rain and dust. Saves fuel. Sells fast; everybody wants it for economy's sake. Simple; easy to put on. Approved by architects, carpenters, and builders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

Send now for money-making plans.

The Henry Airtight Weatherstrip Co.

510 Elm St., Crawfordsville, Indiana

This attachment automatically shuts the strip tight against the sill



"Perfect" Concrete Brick Power Machine

C. S. WERT - Inventor and Patentee

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

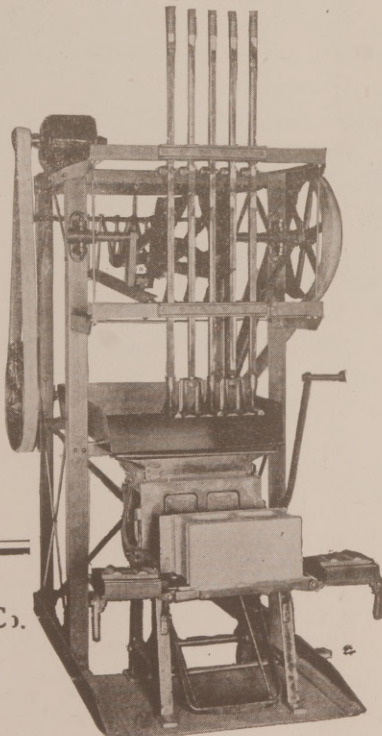
In severe tests, Perfect Concrete Brick have proven stronger than common clay and pressed clay brick.

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

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

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

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



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

Late Model—Gearless and Noiseless.

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 1/4-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

NEVER before in the history of the country has the South seen such active preparations being made and now underway in some parts for permanent road building of all sorts. For years the South has lagged in this respect, but the people are now speaking in no unmistakable terms, through the ballot, that they must have bond issues to carry on the good work.

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

Road and Street Construction.

Anniston, Ala.—Calhoun County Commrs. will construct Gadsden-Heflin roads and Lineville road; will issue \$200,000 bonds.

Ashland, Ala.—Clay County Commrs. will construct 17.2 mi. road from Ashland to Tuscaloosa County line, portion of Ashland-Goodwater road; gravel surfacing; \$363,634.

Birmingham, Ala.—Jefferson County Board of Revenue will repair 20th St.; \$10,000; S. R. Batson, County Engr.

Brewton, Ala.—Escambia County Commrs. will construct 20½ mi. road from Brewton to Sardis Church, portion of Brewton-Bay Minette road; gravel surfacing; \$359,706.

Double Springs, Ala.—Winston County Commrs. will construct road between Haleyville and Double Springs.

Guntersville, Ala.—State Highway Comsn, Montgomery, Ala., will grade and drain 18 mi. Guntersville and Boaz road; \$150,000 available; W. G. Taylor Construction Co., Contr., Wilsonville, Ala.; A. P. Henderson, Div. Engr., Decatur, Ala.

Tuscaloosa, Ala.—Tuscaloosa County Commrs. will construct 25.22 mi. road from Northport to New Livingston, known as Byler road; gravel surfacing; \$545,545.

Fort Smith, Ark.—Fort Smith Road Improvement Dist., Kennedy Bldg., will construct 41 mi. asphalt roads; lowest bidder, Rich Construction Co., East St Louis, Mo., at \$707,688.99.

Helena, Ark.—Geo. T. Wilhelm Co., Box 619, will sublet 2 to 10 mi. sections of 61 mi. one-course concrete pavement, 1-2-3 mix, 6 in. thick, 14 ft. wide.

Little Rock, Ark.—City will construct sidewalks on Lee Ave. Address The Mayor.

Bradentown, Fla.—Manatee County Commissioners, Wm. M. Taylor, Clerk, will construct roads

and bridges in Gulf Shore Special Road and Bridge Dist.; issue \$160,000 bonds.

Marianna, Fla.—Jackson County Commrs., Marianna, Fla., and State Highway Dept., Tallahassee, Fla., will construct 35 mi. highway from Calhoun County line to Alabama State line, 14 ft. wide; bituminous macadam or asphaltic concrete; Chas. A. Browne, State Highway Engr., Tallahassee, Fla.

Miami, Fla.—Dade County Commrs. will construct 1 mi. road from Johnston St. to Buena Vista Drive, 18 ft. wide; invites bids.

White Springs, Fla.—City will pave 1¼ mi. Main St., 16 ft. wide; brick or asphalt; voted \$25,000 bonds. Address The Mayor.

Athens, Ga.—Clark County Commrs. Road and Revenues, Tate Wright, Clerk, will construct 3.73 mi. Athens-Lexington road; Federal-aid Project 129; 1.71 mi. Athens-Danielsville road; bids until Jan. 5; R. T. Goodwin, Div. Engr.

Cedartown, Ga.—Polk County Commrs. Roads and Revenues, Whit. K. Russell, Chairman, will construct 6.5 mi. topsoil road; Federal-aid Project No. 165; bids until Jan. 18; A. A. Simonton, Div. Engr., Rome, Ga.

Cedartown, Ga.—Polk County Commrs. Roads and Revenues, Whit. K. Russell, Chairman, Cedartown, Ga., and City of Rockmart, Ga., will construct 1 mi. chert road and necessary drainage structures in and adjacent to Rockmart; bids until Jan. 18; A. A. Simonton, Div. Engr.

Lagrange, Ga.—City, S. H. Dunson, Mayor, will pave street; voted \$200,000 bonds.

Savannah, Ga.—Director Public Works, J. W. Motte, will pave W. Broad St.; bids until Jan. 12.

Savannah, Ga.—City Director Public Works, J. W. Motte, will pave Whiteaker and Drayton Sts.; bids until Jan. 12.

Henderson, Ky.—City, J. B. Johnson, Makir, will improve streets; contemplated; Woodson Hopkins, Engr.

Mayfield, Ky.—State Highway Dept., J. B. Boggs, Commr., Frankfort, Ky., will construct roads; vote in January on bonds.

Murray, Ky.—State Highway Dept., J. B. Boggs, Commr., Frankfort, Ky., will construct roads; vote in January on bonds.

Newport, Ky.—Campbell County Commrs., Wm. Nilius, Clerk, will improve 2 mi. water-bound macadam road; will invite bids in April.

Paducah, Ky.—City, Fred Katterjoin, Mayor, will grade and pave streets; will invite bids in spring; W. M. Mitchell, Engr.

Smithland, Ky.—Livingston County Commis-

sioners, H. F. Green, County Judge, will grade and pave various streets.

Franklinton, La.—Washington Parish Police Jury, J. R. Leslie, Prest., will construct 10.6 mi. road extending from Bogue Chitto River to the line between Washington and Tangipahoa parishes; bids opened; J. S. Mullings, Highway Engr.

Homer, La.—Highway Dept., Board State Engrs., 332 Maison Blanche Annex, New Orleans, La., will gravel-surface 35.01 mi. road in Claiborne Parish; Davis & Younger, Contrs., 407 Grain Exchange Bldg., Oklahoma City.

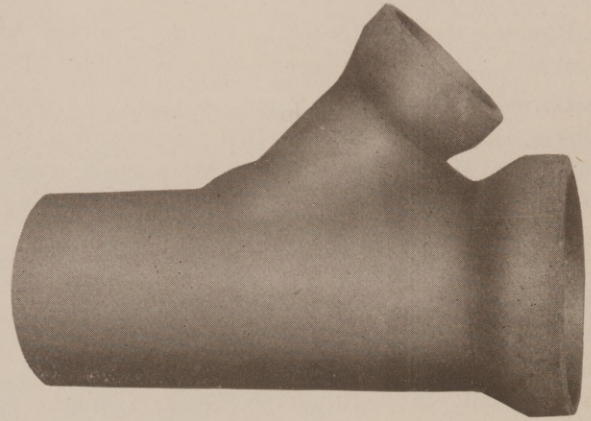
Lake Charles, La.—Calcasieu Parish Police Jury will construct 4 mi. hard-surfaced road, part of Lake Charles-Shreveport highway.

Baltimore, Md.—Paving Comsn. will pave 46 blocks street in old annex, including Old Fredrick Rd., Joseph, Payson, Pulaski and other streets and avenues; sheet asphalt decided upon for paving Pratt St., Broadway, etc.

Baltimore, Md.—State Roads Comsn., 601 Garrett Bldg., plans 2 mi. concrete paving in various counties; will invite bids in spring.

Charleston, Miss.—Tallahatchie County Highway Comsn., Beat 2, J. S. Jones, Secy., will grade and gravel 8 mi. road; gravel or commercial gravel; bids until Jan. 10; Jno. M. Harbert Engineering Co., Engr., Indianola, Miss.

Hattiesburg, Miss.—City will construct sidewalks



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WICKES BROTHERS

360 Water Street

Saginaw, Michigan

from City Cemetery to Pine St. Address The Mayor.

Moss Point, Miss.—City, George W. O'Neill, Mayor, will pave Main St.; concrete.

Bowling Green, Mo.—Pike County Commrs. will construct 2.5 mi. earth road; bids until Jan. 21.

Caruthersville, Mo.—Pemiscot County Commissioners, Hayti Special Road Dist., care of Wm. Rankin, Hayti, Mo., will construct 5.93 mi. road; gravel; bridges; bids until Jan. 28; C. E. Smith & Co., Engr., St. Louis, Mo.

Excelsior Springs, Mo.—City, Walter Bales, Clk., will pave streets; 1200 sq. yds.; bids opened; C. A. Shockley Engineering Co., Engr., 800 Graphic Arts Bldg., Kansas City, Mo.

Huntsville, Mo.—Randolph County Commrs. will construct 1.66 mi. concrete road; bids until Jan. 20; Carl Haynes, Engr., Moberly, Mo.

Springfield, Mo.—State Highway Board awarded contract to Springfield Special Road Dist., Brighton, Mo., for constructing 31.33 mi. Oklahoma-St. Louis road, Sections A and B. Federal-aid Project 150, Greene County; H. P. Moberly, Div. Engr., Woodruff Bldg., Springfield.

St. Louis, Mo.—Board Public Service contemplates the widening of Franklin Ave.; \$607,306; Charles H. Diehl, Secy. Advisory Committee. in charge.

St. Joseph, Mo.—Buchanan County Commissioners will pave 20 mi. road from St. Joseph to Atchison, Kan.; contract to Cook-O'Brien Construction Co., 304 Railway Exchange Bldg., Kansas City, Mo., and Jas. Stanton, Leavenworth, Kan.

Ashville, N. C.—City Commrs. plan widening Woodfin and Oak Sts.

Canton, N. C.—City will pave streets and sidewalks, etc.; voted \$150,000 bonds.

Charlotte, N. C.—Progressive Realty Co., T. T. Cole, Prest., will lay cement sidewalks and pave streets.

Franklin, N. C.—State Highway Comsn., Raleigh, N. C., will grade and gravel $4\frac{3}{4}$ mi. road between point north of Bradley Creek and Cowee-Franklin Township line, 14 ft. wide; Federal-aid Project 97-B, Macon County; bridges and culverts; W. S. Fallis, State Highway Engr., Raleigh, N. C.

Graham, N. C.—State Highway Comsn., Div. office, Greensboro, N. C., will construct road from Town of Graham to Caswell County line.

Greensboro, N. C.—City Commrs. will pave Fairmont St., Hillside Drive and Lakeview and Woodlawn Sts.; R. G. Lassiter, Contr.

Lexington, N. C.—State Highway Comsn., Raleigh, N. C., will improve 4.54 mi. road from Forsyth County line to Guilford County line; Federal-aid Project 82, Divison County; Heilig & Sherill, Contrs., Winston-Salem, N. C.

Lillington, N. C.—State Highway Comsn., Raleigh, N. C., will grade and topsoil 21.9 mi. road be-

tween lower Little River and Harnett-Wake County line, 18 ft. wide, Federal-aid Project 102, Harnett County; bridges and culverts; W. S. Fallis, State Highway Engr., Raleigh.

Louisburg, N. C.—Franklin County Commissioners, Township Road Comsn., Harris Township, F. W. Justice, Chrmn., will construct roads; issue \$50,000 bonds.

Troy, N. C.—State Highway Comsn., Di. Office, Greensboro, N. C., will improve 3.72 mi. road between Mt. Gilhead and Wadeville; Federal-aid Project 33; \$14,589; S. L. Davis Co., Contr., Albemarle N. C.

Wilson, N. C.—State Highway Comsn., Raleigh, N. C., will improve 7.63 mi. road between Wilson-Wayne county line and Wiggins Mill, 18 ft. wide, Federal-aid Project 127; and 6.25 mi. road from Wilson Township line to Wilson-Nash county line, 18 ft. wide, Federal-Aid Project 117; contract to Wilson County Road Commrs.

Mangum, Okla.—City Commrs., John H. Tomme, Clk., will pave and improve Oklahoma and Pennsylvania Aves., Jefferson, Lincoln and Pierce Sts.; bids until Dec. 28; Johnson & Benham, Conslt. Engrs., Frestone Bldg., Kansas City, Mo.

Goldsboro, N. C. City, J. G. Tyson, Clerk, will improve streets; issue \$227,000 bonds.

Marion, N. C.—State Highway Comsn., Raleigh, N. C., will grade, drain and construct 8 mi. road between Marion and Old Fort, 16 ft. wide, Federal-aid Project 84-C, McDowell County; bridges and culverts; W. S. Fallis, State Highway Engr., Raleigh, N. C.

Mocksville, N. C.—State Highway Comsn., Raleigh, N. C., will grade and topsoil 7 mi. Mocksville-Winston-Salem highway, 18 ft. wide, Federal-aid Project 136, Davie County; bridges and culverts; W. S. Fallis, State Highway Engr.

Rockingham, N. C.—State Highway Comsn., Raleigh, N. C., will construct 17.28 mi. road between Hamlet and Richmond-Moore County line, 18 ft. wide, Federal-aid Project 129, Richmond County; bids until Dec. 30; W. S. Fallis, State Highway Engr., Raleigh.

Jackson, Tenn.—City Commrs. will improve Eden and Nelson Sts.

Knoxville, Tenn.—City Comsn. will pave Payne, Seventh Sts., Thompson Pl., etc.; issue \$150,000 bonds; Fred M. Maloney, City Engr.

Knoxville, Tenn.—State Dept. Highways, Nashville, Tenn., will construct 12.76 mi. State Highway No. 2 between Station 130, near Bearden and London County line, Section B, Federal-aid Project 41, Knox County; bids until Jan. 17; W. P. Moore, Ch. Engr., Nashville, Tenn.

Austin, Tex.—City will tarviate Red River St. and East Ave. Address The Mayor.

Cuero, Tex.—City will pave Broadway. Ad-

dress The Mayor.

Brenham, Tex.—City will pave streets; voted \$40,000 bonds. Address The Mayor.

Canadian, Tex.—Hemphill County Commrs. will construct 13.44 mi. Highway No. 4 from Canadian to Lipscomb County line; \$32,300.38; J. F. Hamer, Contr., Fort Worth, Tex.; C. L. Hasie Engineering Co., County Engr., Amarilla, Tex.

Columbus, Tex.—Colorado County Commrs. will construct 4 mi. road between Glidden and Borden; will invite bids; B. H. Faber, County Engr.

El Paso, Tex.—City will pave Cumberland St. Address The Mayor.

Coming Road Builders Show.

Many manufacturers of road building machinery, road materials and highway transportation equipment are preparing to send exhibits of their products to the Twelfth National Good Roads Show to be held at the Coliseum in Chicago, February 9 to 12 next. The exposition will be one of the big features of the Eleventh American Good Roads Congress to be held in Chicago at that time in conjunction with the Eighteenth Annual Convention of the American Road Builders' Association, an organization of the public highway officials and road machinery, road materials and highway transportation men of the United States and Canada. Chicago was chosen for the Congress and exposition this winter because of its central location and the splendid facilities afforded at the Coliseum for a successful show.

The president of the American Road Builders' Association this year is M. J. Faherty, president of the Board of Local Improvements, City of Chicago. Both Mr. Faherty and the other officers of the Association are leaving nothing undone to make the coming exposition the most notable in the organization's history. The secretary of the association recently spent several days in Chicago making the local arrangements in conjunction with Mr. Faherty and others. More than forty thousand square feet of floor space in Chicago's big exposition hall will be devoted to the exhibits, which, this year, owing to the tremendous increase in road building and street improvement work since the close of the war, promises to exceed in number and variety those of the expositions held at Boston, Pittsburg and Chicago before the war. The interest manifested in the coming exposition is, even at this early stage, most unusual.

Many new types of road-building machinery and highway transportation equipment will be shown. Demonstrations in the use of road-building and street-paving materials, through improved methods

and under improved conditions, will be featured. The show will open February 9 and will close February 12. Both the Congress and the exposition will occupy the Coliseum, the sessions of the Congress being held on the floor immediately above that on the ground floor devoted to the show.

Governors of states and Mayors of more than one thousand American and Canadian cities are expected to appoint several delegates to attend the Congress and visit the exposition. In some instances Governors and Mayors will head their own delegations. Officials of government, state, county and city highway departments from all parts of the United States and Canada, and from Cuba, Porto Rico, Hawaii and Alaska will attend the congress and visit the exposition, together with road, automotive and chemical engineers, contractors, agriculturists, motorists and large users of trucks, tractors and other highway transportation equipment.

Arrangements have been perfected at the Coliseum that will afford excellent facilities for displaying exhibits to advantage. Exhibits will be confined to the materials, machinery and equipment used in the construction and maintenance of roads and pavements and to publications covering that field. Power for the operation of machinery on exhibition will be supplied by the Coliseum Company. The installation of exhibits will begin on February 7 in order that everything may be in readiness for opening the show at 9 A. M. Wednesday, February 9. The show will close at 4 P. M. the following Saturday. The indications are that this exposition will attract crowds each day, not only because of the central location of the convention city, but because of the intense revival of interest in good roads that has followed the war.

Removal of Spanish Import Duty on Cement.

A cablegram from Trade Commissioner W. M. Strachan, at Madrid, November 4, 1920, states that the Spanish Government has removed the import duty of 0.50 peseta per 100 kilos (\$0.043 per 100 pounds) until further notice, effective from December 1, 1920. Cement will be subject to an export duty of 5 gold pesetas per 100 kilos. (Peseta=\$0.193; 100 kilos=220.46 pounds.)

Contractors' Machinery.

A folder, bountifully illustrated, is issued by the Austin Machinery Corporation, (Railway Exchange Bldg., Chicago, Ill., showing the Austin products, which include a wide variety of contractors' machinery engaged upon different kinds of work. This folder is appropriately titled "Brobdingnagians of Industry," which is expressive of their astonishing capacity and power. Catalog No. 201 gives full particulars about the machines illustrated in the folder. The pictures are very fine.

November Building Activities.

Building activities in the United States for November according to statistics of 203 cities, as given in the last issue of the American Contractor, show a recession of more than \$20,000,000 from the October 1920 total and an even 50 per cent reduction from the total for November 1919. For these 203 cities a total of 28,243 permits is given, the valuation being \$74,098,500. Building permits in October totaled \$96,172,999 for 191 cities.

Of the cities for which comparable figures are available, 134 show a decrease in building activities; 52, an increase.

The average valuation of the November 1920 permits per city is \$365,017. For November 1919 the city average was \$744,190 and for October 1920 it was \$503,524. The city average for November 1920 is therefore approximately \$400,000 less than for the same month last year and \$138,507 less than for October 1920.

The following table shows the city average for the past three months of 1914 to 1920 inclusive:

Year	September	October	November
1920	\$501,640	\$503,524	\$365,017
1919	860,000	890,000	775,000
1918	225,000	162,000	94,850
1917	435,000	498,000	365,500
1916	627,000	776,000	605,800
1915	594,000	807,000	614,700
1914	593,000	567,000	464,000

Pacific Coast and southern cities, as would be expected at this season of the year, are leading in building activities. Above the Mason-Dixon line some are showing an increase over November 1919, the most notable being South Bend, Indiana with an increase of 307 per cent. It is also interesting to know that the activities are proportionally greater in the smaller towns than in the cities. This was also true in October.

Own Your Own Home Day—January 20.

Definition of Save:—"To put by; to refrain from spending. Opposite term to spend."

So says the hoary old sage whose wisdom is contained between the calfskin covers of the dictionary. But a wiser individual has arisen to prove him wrong by demonstrating that saving and spending can be kindred, instead of opposite terms.

Does it seem paradoxical to you for a Thrift Week program to advocate spending? Well, that's what this Thrift Week does. And maybe the notion of saving and spending being on friendly terms won't seem so funny to you once you've thought it out carefully.

"Spend, but spend wisely.—That's the whole secret. By planning expenditures in advance; by making your money work for you; by investing it in such a way that it benefits both you and your com-

munity." That's the lead Thrift Committees are following in their economic program.

"Own Your Own Home Day" featured on the fourth day demonstrates how intelligent spending plays as important a part in the life of the thrifty man as saving. That the man who buys his own home is spending his money wisely, making a sensible investment, benefitting himself and his family financially, improving his moral standing and through such ramifications helping his community development, is set forth in the educational pamphlets issued by the committee in exploiting Own Your Own Home Day.

Leading real estate men throughout the country have displayed a keen and sympathetic interest in this phase of the program. The cordial co-operation of the National Association of Real Estate Boards, the National Federation of Construction Industries, the U. S. League of Building and Loan Associations, as well as the support of the church, the civic organizations and the leading commercial and industrial organizations everywhere has been pledged to the Movement. Thrift Week begins January 17th and lasts the week through including the 23rd. It is launched under the leadership of the Y. M. C. A. together with other organizations and comes as the culmination of a year-through program of economics. The purpose of the Economic Program and National Thrift Week are expressed in the program outlined below.

1. To stimulate the individual to think straight and act wisely in regard to money matters in the realms of earning, spending, saving, investing and giving.

2. To teach the simple and sound economic truths suggested by a Ten Point Financial Creed.

3. To concentrate the attention of a large part of the nation for a week on the benefits of living thriftily.

4. To conserve the results of this nation-wide emphasis by organizing Thrift Clubs through which to continue this emphasis.

5. To develop character in the lives of individuals by making possible a spiritual development unhandicapped by financial worries.

The Ten Point Creed preaches this simple and helpful gospel:

1. Work and Earn.
2. Make a Budget.
3. Record Expenditures.
4. Have a Bank Account.
5. Carry Life Insurance.
6. Own Your Own Home.
7. Make a Will.
8. Invest in Reliable Securities.
9. Pay Your Bills Promptly.
10. Share with Others.

What's on Program at Convention of American Concrete Institute

THE next convention of the American Concrete Institute will be held in Chicago, February 14, 15, and 16 at the Auditorium Hotel.

The Program Committee, appointed by the Board of Direction at a meeting in New York October 6, consists of the Secretary, W. M. Kinney, and Charles R. Gow.

This committee especially urges the early completion of reports and paper for presentation at the convention so that the greatest possible amount of this material may be in type and in the hands of members of the Institute in preprint form prior to the convention, as it will require more than three weeks from receipt of material by the Program Committee to the receipt of preprints by the members of the Institute. It is important that committee work and technical paper preparation be wound up as early as possible.

The value of most papers and reports to the membership of the Institute is greatly enhanced if those attending the convention are familiar with the subject matter and are in a position to offer discussion. Painstaking as committee work may be, the best of it may usually be improved upon by discussion in open forum.

Proposed new standards and revisions of standards to be considered by the convention for submission to letter ballot, must, according to the by-laws of the Institute, be submitted to the membership at large, thirty days prior to convention. This means that such standards and revisions of standards unless adopted of them is to be delayed an entire year must be received by the Program Committee and turned over to the secretary of the Institute not later than December 15. This date is fixed after a careful consideration of the requirements of the printers in handling the material, reading proof, issuing preprints, and mailing them to the Institute membership by January 11. Manuscript received as late as December 15 cannot be returned to the author with proof and if a committee desires to see proof before publication, another week must be allowed.

Committees are urged to get their material in as much earlier than this as possible so that congestion in the printing establishment may not upset publication plans.

Chairman of committees which will have reports to make and authors of papers submitted for presentation at the convention will greatly facilitate the

work of the Program Committee in the arrangement of sessions of the convention to the best advantage if they will make the earliest possible report to the secretary with an outline of what they propose to submit and the approximate date on which the completed paper or report will be ready. Notice should also be given if the use of a lantern for the illustration of papers will be needed.

Papers and reports for presentation at the convention in February other than those intended for adoption as standards (which must be available by December 15) should be in the secretary's office complete in every detail with finished drawings and photographs from which illustrations are to be made not later than January 15 if the Program Committee is to consider at all the advisability of reprinting the material and sending it to the membership in advance of the convention, for the purpose of encouraging discussion.

While the Institute's committees are urged to complete the details of their work so far as concerns what is to be presented to the next convention it is realized that committees find it necessary to hold meetings at various times during the convention especially for the consideration of suggested revisions and to provide for such necessary committee work, reservation has been made of two rooms in the Auditorium Hotel on the same floor as the convention meeting room where the committee members may get together, upon scheduling their room requirements for such meetings with the Secretary as early as possible.

While the Institute is making excellent progress in increasing its membership both active and supporting as will be noted from the new names appearing elsewhere in this leaflet, it is a very disconcerting situation to be obliged to drop from the membership at this time about 25 names of those who lost membership solely by failing to indicate their willingness to pay the annual dues.

A joint meeting of the Institute committee on Concrete Tanks is proposed in the near future with the N. F. P. A. Committee on the storage of Inflammable Liquids. J. E. Freeman will probably represent the Institute committee. In the meantime H. B. Andrews, chairman, has asked for suggestions in reference to revisions of the tentative report submitted last February. In view of some reported experiences in the construction of oil tanks

by contractors not familiar with the work, it has been suggested by one member of the committee that consideration be given to the necessity of some method of oil-proofing the interior of the tanks.

F. R. McMillan, of the Turner Construction Co., has been engaged in a careful study of data on reinforced concrete tests with a view to the development of a formula for the design of spiral columns. The work has been conducted in collaboration with E. J. Moore of the Turner Company, who is working on the sub-committee on Design of the Joint Committee on Specifications for Concrete and Reinforced Concrete. It is probable that a very valuable paper will be available from Mr. McMillan for the Institute convention setting forth the results of the study. Tentatively the title suggested for the paper is "Study of Reinforced Concrete Column Tests and Proposed Formula for Design." This study involves some new features, among other things attempting to reduce to the same basis, tests from different sources.

In this connection, it is indicated that much more liberal provisions may be arrived at than those of the old Joint Committee, approaching more nearly those now largely in use under the authority of a number of building codes.

Some revisions of the newly adopted Standards on Sewers are being considered by the Committee on Sewers, of which W. W. Horner is chairman, with a view to their presentation at the convention in February.

There is unusual interest in what the Committee on Houses, of which Emile G. Perrot is chairman, will have to present at the February convention. It is felt that Standards in House Construction are badly needed—something definite on which local building authorities may depend in removing obstacles (in the nature of unnecessarily conservative and highly uneconomical requirements) which prevent the more rapid adoption of concrete for dwelling house construction. It was pointed out at the National Conference on Concrete House Construction last February, in a paper by Fred W. Lumis, Building Commissioners, Springfield, Mass., that codes are "general not specific, alike to the warehouse and the cottage," and that "supports and walls in large structures are designed principally with respect to their compressive strength. But the designer of a concrete house is not permitted to use any such economics." In the meantime practical builders are going ahead, where regulations do not hinder, and concrete houses are being erected—some along radical lines as viewed from the ideas of design with which we have become accustomed.

A. B. McMillan, Boston, chief engineer of the

Aberthaw Construction Co., has been appointed by President Turner to succeed Leonard C. Wason (resigned from the committee) as a member of the Institute's representation on the Joint Committee.

The Committee on Research, W. K. Hatt, Chairman, proposes to offer at the February convention a report outlining those fields of research in relation to concrete, which need to be occupied at this time and the various organizations which are now planning for co-operative research in these fields.

The Committee on Concrete Aggregates, Sanford E. Thomas, Chairman, is considering the desirability of an investigation of slag as a concrete aggregate.

In response to his request for suggestions, R. F. Havlic, Chairman of the Committee on Concrete Products, has received a letter from a manufacturer of concrete brick indicating the need for study of concrete building units of various kinds. The letter is of such general interest and indicates so clearly work that needs to be done that it is quoted in parts as follows:

I believe this committee should collect data concerning the structural characteristics of concrete products.

Concrete products are used to a large extent as a substitute for other building materials. They are very often required to meet results obtained in testing these other materials. Such results are not always a true indication of the structural value of such materials, but frequently an indication of the quality of such materials.

I have in mind the compressive strength of clay brick. The results obtained in testing clay brick in compression are not used in the structural design of a brick masonry wall. Instead the compressive test results are an indication of the hardness or degree of burning of such clay bricks. Is it fair, therefore, to require concrete products to develop the same compressive strength?

This condition is caused primarily by the lack of active information regarding the structural qualities of concrete products. If it were generally known what a concrete block, or concrete brick, or concrete tile, made under proper conditions, would do under certain conditions, then architects and engineers would be willing to accept as a standard specifications based on the characteristics of concrete rather than on the characteristics of clay or some other building material.

In brief, specifications for concrete products should be based on concrete as a material and its characteristics rather than on clay or whatever other material it replaces.

I believe that this is proper work for this committee to initiate and undertake, with the co-opera-

tion of the Bureau of Standards, American Society for Testing Materials and the Portland Cement Association.

The Federated American Engineering Societies, Joint Conference Committee of the American Society of Civil Engineers, American Institute of Mining and Metallurgical Engineers, the American Society of Mechanical Engineers and American Institute of Electrical Engineers extended an invitation to the American Concrete Institute to join the federation movement and become a charter member of the

Federated American Engineering Societies. Richard L. Humphrey, former President of the Institute, is Chairman of the Joint Conference Committee and urges the step. He will have an opportunity at the Institute's convention in February to say something for the Federation.

"The Shrinkage of Portland Cement Mortars and Its Importance In Stucco Construction" will be the subject of a paper by J. C. Pearson, United States Bureau of Standards, at our February meeting.

Road Maintenance Plans Announced

THE following statement in regard to maintenance of roads which are a part of the state highway system was given out by the state highway department:

All road projects forming a part of the state highway system are to be taken over for maintenance by the state highway department. Whether such a project was built by a combination of county state and federal funds, or by a county alone, or by the state alone, will make no difference. If it is a part of the state highway system the state highway department will maintain it.

"Twenty-six projects have been completed, and eighty miles of these have been taken over for maintenance already. The balance will be taken over shortly. The counties where systematic and scientific maintenance has already been commenced are Spalding, Henry, Clayton, Walton, Hall, Macon, Coweta, Meriweather, Troup, Douglas, Bibb, Jackson and Wilkes.

"It is the plan of the state highway department to make its maintenance of highway roads a model for the benefit of the counties in the maintenance of their roads. As is well known one of the main factors in the creation of good roads is the factor of maintenance. No matter how expensive construction may be, its life is greatly shortened by the lack of constant, systematic and scientific maintenance.

"On sand clay roads there will be a patrolman for three to eight miles of road, depending upon the particular requirements, etc. The patrolman will be a reliable man who lives about the center of his section of road. He will be equipped with a wagon, a drag, a dump scraper, a set of double harness and complete outfit of tools. He will furnish his own mules. His duties will consist of the following:

"To drag the road after every rain; to clean out culverts and drains; to cut brush and weeds on the

right-of-way; to keep ditches opened; to fill holes and washes; to replace sand and clay when necessary; to renew the whitewash on telephone poles, and other objects along the road; to repair signs, etc.

"Concrete roads will be patrolled by a gang consisting of a foreman and four or five men. They will cover longer sections of road than the sand clay patrolmen, as they can travel and work faster. Each concrete repair outfit or maintenance crew will be equipped with a miniature mixing and pouring outfit, a small automobile truck, and a complete set of tools. They will keep the sand clay shoulders of the road at proper grade, with holes and washes filled; keep the expansion joints in good repair, fill house with new concrete where necessary and in general, keep the right-of-way clear and clean, macadam roads will be equipped with a complete outfit for mixing and pouring bituminous macadam.

"State highway system roads will be easy to recognize by their general maintenance and upkeep. Telephone poles, tree trunks and sign posts along the roads will be whitewashed and renewed at frequent intervals to keep them white. This will make a road easy to follow day or night. Embankments and bridge approaches will be protected by guard rails, which will be whitewashed. Culvert and bridge headwalls also will be whitewashed.

"Every railroad crossing, road intersection, steep grade and bridge will be designated by signs placed 300 feet distant on both approaches. The signs will be on the right of the road, where they will meet the driver's eye. They will be painted in red letters on a white background, as they are intended for warnings.

"Every road intersection will be equipped with direction signs to aid the traveler in keeping the right road. These signs will have arrows pointing in both directions of the state highway and naming

the principal terminal points in both directions. In addition to these intersection signs, the telephone poles along every state highway will be stenciled with a diamond-shaped sign with black letter on white back-ground. There will be a stencil sign on every fifth pole.

Bradford's Municipal Housing.

It is announced that in an effort to aid in remedying the present shortage of houses in Bradford the city plans to start at once building 260 dwellings. These are not to be built by contract but directly by

the city itself, under the direction of the city surveyor. It is hoped that they may be ready for occupancy next year.

The bricks will be furnished by the municipal brickyard, which has been remodeled and the machines of which are now all electrically run. To hasten the work large wooden workshops have already been erected in which fittings are to be made and in which, also, in bad weather the reinforced concrete window sills, doorsteps, etc., will be manufactured. Because of the prohibitive price of stone, concrete is to be used.

Why Road Materials Should Be Shipped and Stored Very Early

THE Road Building season in the Northern States is from May to November—about six months. The average contractor, however, is able to build roads only about half of this time, for he has to contend with rainy weather, some of his men fail to show up for work some mornings, a piece of equipment may go wrong, he may not have material, etc., etc. There are a hundred and one things that may happen on a road job to delay it, and as a result, the end of the season finds the contractor with only 75 to 100 actual working days to his credit.

The contractor is constantly trying to anticipate and prevent these delays. He adopts methods and plans his work to overcome as far as possible delays because of rains. To eliminate labor trouble he buys modern machinery that does work formerly done by hand. But his biggest delays have been because the railroads have not delivered material to him regularly during the construction season.

If the road which are needed and wanted are to be built, something must be done to assure the contractor when he starts work in the spring that he will have his materials when they are needed. It is useless to expect him to build any considerable mileage of roads when he has to shut down his work every few days waiting for sand, stone or cement.

For that reason, The Lakewood Engineering Company sent letters to contractors, highway engineers, banks, chambers of commerce, railway officials, and others interested or concerned with the country's highway program, pointing out that: If Road Materials are transported and stored during the winter and early spring months when open top cars are more available than they are during the construction season, the contractors could proceed with considerable less interruption and their working season would be increased accordingly.

A great many replies have been received to these letters. Most of them are in hearty accord with the plan suggested and offered help in making it a success. Several letters tell what has already been done along this line. For instance, at Ogden, Utah, materials for twenty miles of road were shipped in last winter, and this road was completed during the past season in record time. The State of Delaware has followed this practice for three years.

The Board of Freeholders of Passaic County, New Jersey, have acquired a central storage yard for stockpiling road materials this winter. An Illinois City, Belleville, has already stored cement for next season's work.

It is surprising that the idea is apparently new to many. It was strongly urged last year by several State Highway Departments, as well as the U. S. Office of Public Roads. Nevertheless, many of the letters which we have received indicate that the idea is a new one in many parts of the country.

The replies which have been received now make it possible to analyze the subject in detail from the viewpoint of everyone interested, taking into consideration the arguments against, as well as the arguments for.

This analysis follows:

The Supply of Open Top Cars and its Relation to Road Construction.

Road Building materials are usually shipped in open top or gondola cars. In the Northern States, the greatest demand for these cars comes in the summer months when they are required for handling coal, ore, sand and stone for construction work and road building, etc.

In a few instances it has been pointed out by railway executives that on their own particular lines this condition does not exist and these cars are more in demand in the fall, winter, and early

spring months than during the summer. However, taking the country as a whole, it is a fact that there is generally a shortage of open top equipment in the summer, and surplus in the winter. One reason for this is because the navigation season on the Great Lakes closes in November for the transportation of coal and ore. Many cars are needed for this service during the summer and early fall.

At the close of the navigation season, these cars are released, and for a short time are busy, carrying coal to the local territory which can be served after the Lake trade is taken care of. But this local service is practically at an end by the last of December when there begins to accumulate a surplus of open top equipment. The transportation of coal slumps off rapidly after this time, as coal contracts are made on April 1st, and from January until that time there is only a very small amount of this business for the railroads.

It has been the general practice to request shipments of road materials during the actual construction season. The result has been that the railroads are always contending with a peak load just at the time the contractor could do his most effective work if he were able to get his materials. The inability of the railroad to furnish the necessary cars very often makes it impossible for the contractor to get well started on his work, with the result that the close of the season finds him with a job which must be carried over until next year.

On the other hand, if the surplus cars which are available during the winter and spring months could be put at work hauling materials to be stored by the contractor until his season opens, he would be assured of steady work when he did get under way.

Financing The Transportation and Storage of Materials Ahead of Time:

The question most frequently asked about the early transportation and storage of road building materials are—How is the contractor to pay for the materials and for their transportation, and why should he contract for materials at the present prices when there may be a possibility of a decline in price?

A number of States, recognizing the advantage of the early transportation and storage of materials, have made it possible to pay the contractor in full or in part, for material when it is delivered. This can now be done in the following States:

Alabama, Arkansas, California, Colorado, Connecticut, Delaware, Georgia, Idaho, Illinois, Iowa, Kansas, Maine, Maryland, Minnesota, Michigan, Nebraska, New Hampshire, New York, Rhode Island, South Dakota, Tennessee, Virginia, West Virginia, Wisconsin, Wyoming, District of Columbia, Oregon and Vermont.

In ten other States such procedure is not possible at the present time under existing statutes.

In only three States is there any sentiment against this proceeding.

In those States where it is possible for the Highway Department to make such payments, it will of course be necessary for the contractor to finance the transportation and storage of materials ahead of time. In such instances, he will have to arrange with his banker for the needed funds. But even if he does have to borrow the money, there is every reason why he should do so. The interest on the amount required is absolutely insignificant when compared to the sum the contractor will lose if he should have to shut down his job even only a few days because he can not get regular delivery of material during the construction season.

There now seems no possible reason to look forward to lower prices for materials next year. Freight rates have increased, and a larger demand for material is expected. The demand is increasing in many localities faster than the supply. Freight rates and the law of supply and demand are the two principal factors governing price. Therefore, it does not seem that material prices will go down. Yet even if there were hope for a decline by next season, the extra cost to the contractor buying his materials for winter and spring storage will really be only a small insurance premium guaranteeing that he will not have to close down his work every few days to wait for materials. Such slight extra cost is mighty cheap insurance.

The banks of the country are more than willing to help. A contractor needing financial assistance to aid him in shipping and storing materials early should not hesitate to go to his banker. Money loaned for this purpose is really backed by the security of the State for which the road is to be built. And what better security could be wanted?

Freezing Weather Will Not Prevent Winter & Spring Shipments of Road Materials:

The difficulty of unloading sand or stone which has frozen in transit is an objection which is frequently raised to the shipment of road materials during the winter months.

It is true that these materials may freeze in the cars, but material for road construction is shipped generally only a comparatively short distance, and such freezing will be confined to a thin crust unless the cars are delayed in transit or unloading. The proper unloading equipment will make it possible to get the materials out of the cars in a minimum amount of time, which will prevent it from freezing solid.

Where material is delayed, and becomes frozen in severe weather it, of course, will be necessary to employ steam pipes, or to apply heat in some other way to thaw it before it can be handled from the cars. But such procedure is far from impossible.

In the Fall it is not possible to continue actual

paving where the subgrade freezes slightly at night. Although the temperature during the day may not be below freezing, the contractor will not be permitted to place concrete. But such weather is ideal for continuing unloading and storing materials for next season's work.

In some of the Northern States, where very severe weather prevails, it would, of course, be necessary to withhold shipments during extremely cold weather, because even though they are transported for only a short distance, they may become frozen solid in a very short time under such conditions.

However, in such states where these conditions do prevail, it is possible to ship materials at all times except during the dead of winter.

Quarries Often do Not Supply Material During The Winter Months:

Many quarries close down during the winter months—therefore, an argument has been made that materials will not be available for winter shipment.

So far as we are able to learn, the quarries close down largely because of habit. There has been no

active market for them during the winter months. They have preferred to stop their work instead of assuming the burden of stocking their materials until next season. If a market could be assured for the quarries which would absorb their output, there is no reason why they should not operate twelve months out of the year, with the exception of time required to make repairs.

What Can Be Done To Encourage Early Transportation And Storage of Road Materials:

Everyone who is interested in the completion of highway projects which have been planned, can accomplish much good by bringing this subject to the attention of those actively concerned with the contemplated improvements. The more publicity which can be given to the entire proposition, the better. Such publicity will lead to further discussion, and such discussion will generally bring out the advisability of this practice.

Will you help this movement by talking and writing about it, and personally supporting it whenever possible?

The Successful Stucco Depends on Correct Details

THE following extracts from the copyrighted proceedings of the American Concrete Institute, are given by permission, for the benefit of Architects designing in stucco. They represent a nation wide survey, and analysis of thousands of houses, and all known tests, by a committee of Architects, Engineers, Contractors, material manufacturers and representatives of the U. S. Bureau of Standards.

A choice of the back-plastered Metal Lath stucco construction for the home, will prove a particularly happy selection because:

(1) It is the least expensive form of incombustible and permanent exterior finish. (A saving of two to four hundred dollars is made over any other stucco construction).

(2) It presents an opportunity for infinite variety of Architectural treatment. Wide choice of color and even texture is possible. It harmonizes with trees and shrubs, is suitable for large or small buildings.

(3) It is already much in demand and a thorough appreciation of its possibilities is rapidly growing.

(4) The U. S. Bureau of Standards gave the

back-plastered Metal Lath samples the only 100% perfect rating out of fifty-six panels undergoing severe weather tests covering a period of five years.

(5) The Underwriters' Laboratories Chicago, in a preliminary report on back-plastered construction indicated that this finish can be expected to furnish a substantial barrier to the passage of flame into the hollow spaces back of it and provide sufficient heat insulation to prevent the ignition of the wooden supports to which it is attached for about one hour when exposed to fire of the degree of severity to which stucco finished buildings are likely to be subjected under average exterior fire exposures."

(6) The National Board of Fire Underwriters in the latest (1920) edition of the Dwelling House Code recognize the fire resistive qualities of back-plastered stucco construction by including it under Type III, "buildings with walls of either masonry brick veneer, or cement stucco." It states that "the back plastering makes board sheathing unnecessary and provides a stronger wall than when sheathing is used."

(7) Tests at Armour Institute of Technology and at Omaha have shown back-plastered Metal

Lath construction to possess the greatest strength and rigidity.

(8) In fact it is an ideal material in the successful use of which America's Architects have achieved notable results.

This is published at this time primarily for the use of Architects and architectural draftsmen as an aid in designing the Back-Plastered Metal Lath and Stucco House in the "Small House Competition" now being conducted by the "Own Your Home Exposition," but should prove a convenient reference in any stucco designing.

The approval of the American Institute of Architects is given to the competition and prizes aggregating \$4800 will be awarded.

Additional information can be had on application to Henry K. Holsman, A. I. A., 175 West Jackson Boulevard, Chicago, Ill., Architectural Advisor, Small House Competition, or to the commissioner Associated Metal Lath Manufacturers, Edison Building, Chicago.

Mortar Making Properties of Cement.

Tests to determine the effect of different conditions and periods of storage on the concrete and mortar making properties of Portland cement have been under way for the past 3½ years at the Structural Materials Research Laboratory of Lewis Institute. The results so far obtained are set forth in a previous report, prepared by Duff A. Abrams, professor in charge of the laboratory, and published this month by the laboratory as Bulletin 6—"Effects of Storage of Cement."

Tests were made on three different lots of Portland cement, which had been in storage for periods up to two years. The cements were stored in (A) In testing laboratory, a large, steam-heated room on the ground floor of Lewis Institute, temperature quite uniform during the winter; humidity low during winter; (B) in basement of Lewis Institute, temperature 5-10 degrees F. lower than (A), humidity rather high at all times; (C) in shed in yard near laboratory; no artificial heat. The sacks were piled on the floor about 1 ft. from the ground. A roof and thin board walls protected the sacks from direct contact with rain and snow, but allowed free circulation of outside air. The conditions here were similar to those in a temporary cement storage shed erected in the field.

In general the cement was stored in lots of 800 to 1,200 lb., in standard cloth sacks; in one group of tests two brands of paper sacks were used. In another group the cloth sack containers were covered with thin layers of (1) Portland cement and (2) hydrated lime. Tests were made at ages of 7 and 28 days, 3 months, 1 and 2 years, on samples taken immediately upon receipt from the dealers' warehouses

and after storage for 3 and 6 months, 1 and 2 years.

The report includes compression tests of about 1,000 6x12 in. concrete cylinders, about 1,000 2x4 in. cylinders of 13 standard sand mortar, and about 500 miscellaneous tests.

The following are the principal conclusions from the investigation:

There was no essential discrepancy between the indications of the compression tests of 1-5 concrete in the form of 6x12-in. cylinders and the tests on 1-3 standard Ottawa sand mortar in 2x4-in. cylinders.

Compression tests of concrete and mortar showed a deterioration in strength with storage of cement for all samples, for all conditions and periods of storage and at all test ages. The deterioration was greatest for the samples stored in the shed in yard, and least for the samples stored in the laboratory. The basement storage was nearly as severe as outdoors. The deterioration was greater during the first 3 months than for later 3-month periods. A greater deterioration was found in the tests made at the age of 7 days than at 28 days and later tests ages.

After 3-month storage in shed in yard the cement had 80 per cent of its original strength; after 6-month storage, 71 per cent; after 1-year, 61 per cent; after 2-year, 40 per cent. The deterioration was probably greater in these tests than would be found in a larger lot of cement stored under similar conditions.

The effect of storage of cement on the concrete or mortar strength is largely a question of the age at which concrete or mortar is tested. The average concrete strength of cement stored in shed in yard when tested at 7 days (for all periods of storage) is 64 per cent of the strength when received from the warehouse; at 28 days, 71 per cent; at 6 months, 78 per cent; at 1 year, 82 per cent, and at 2 years, 85 per cent. A somewhat similar relation is found for other storage conditions. It is a matter of the utmost importance to note that the strength of concrete is not permanently reduced to the low values found in the 7 and 28-day tests.

For periods up to 1½ years there was no marked difference in the quality of cement stored in cloth and in paper sacks. Two brands of paper sacks gave almost identical results.

Only a slight advantage was found from the protection of cement in cloth sacks which were covered by thin layers of Portland cement or hydrated lime. The results obtained do not justify the cost of this method of protecting cement stored in sacks.

The most favorable storage condition (in laboratory) and the least favorable (in basement and shed) gave strengths of the same order of magnitude; indicating that the possibilities of improving the storage condition of cement in sacks in this

climate is rather limited. The storage period and the age of the concrete or mortar at test are of greater importance than the exact condition of storage, so long as the cement is protected from direct contact with moisture.

Storage of cement prolongs the time of initial and final setting.

The deterioration of cement in storage appears to be due to absorption of atmospheric moisture, causing a partial hydration, which exhibits itself in reducing the early strength of the concrete and prolonging the time of setting.

Only a negligible quantity of lumps were formed up to 1 year storage. The lumps found in the sacks after storage for more than 1 year presents a puzzling feature of such tests; they were generally discarded before testing the cement. Tests on concrete using only broken lumps as cement gave considerable strength.

This series of tests did not include bulk storage of cement, however, there is reason to believe that cement may be stored in bulk for long periods without materially affecting its concrete and mortar-making qualities.

New Cement Products Plants.

Marshall, Mo.—Higginsville Asphalt Co., capital \$1,000,000, inceptd. by M. L. Montague, Prest.; H. C. Francisco, Treas.; will develop 500 acres.

Agatite, Tex.—American Cement Plaster Co., C. E. Williams, Operating Mgr., Conway Bldg., Chicago, Ill.; erect additional plaster and board mill.

Portland, Ga.—Empire Cement & Limestone Co., L. D. Oglesby, Gen. Mgr., Healy Bldg., Atlanta, Ga.; enlarge plant; has equipment; 1500-bbl. capacity.

Tulsa, Okla.—Polish-American Natural Asphalt Co. inceptd.; capital \$3,000,000; Joseph Parker, Tulsa; John F. Samborski, Westfield, Mass.; John J. Haydasz, Hartford, Conn.

Norfolk, Va.—Cementile Roofing Corp. reorganized; A. LeB. Ribble, Prest.; H. D. Griffin, V.-P.; E. B. Griffin, Secy.; erect 38x100-ft. building; purchased site; \$6000; let contract to Griffin Bros. to erect mill-construction building; mfre. roofing tile.

Tampa, Fla.—Ula White way Post Co. (lately noted under Metal-Working Plants inceptd., capital \$50,000) organized; Wm. G. Fulton, Prest.-Mgr.; R. S. Gerry, V.-P.; E. F. Clifford, Secy.-Treas.; mfre. concrete, metal and wood posts.

Method of Resurfacing Worn Brick Pavements with Asphaltic Concrete

By W. E. BALDRY, City Engineer, Topeka, Kan.

The city of Topeka, Kans., has some 120 miles of pavement varying in width from 26 ft. to 90 ft., a large percentage of which was laid between the years 1896 and 1910. This particular paving was of 2-course brick construction, the lower course being No. 2 quality brick construction, laid flatwise upon a sand bed thrown over the subgrade. Over this course a heavy sand cushion, at times reaching some 3 or 4 in. in thickness, was spread, and another course of brick of No. 1 quality was laid on edge, and finished with sand filler. These brick were made largely in Topeka, and while of good quality as brick were made at that time, still they would not make the standard rattler test required of brick today.

With the changes in type of traffic that has taken place since this type of paving has been laid, together with the wear it sustained previous to the appearance of the motor truck, a large part of the

work reached such a condition that it was better to avoid these streets than to attempt to travel upon them with any degree of comfort or speed; they were, however, still usable for heavy hauling, and wagon traffic.

A number of the streets, paved as above indicated, are residence streets; and, also a number of them were heavy traffic streets in the bottoms, carrying wholesale district traffic and coal yards. In a number of instances, the abutting property owners refused to sign a petition to repave these streets, because of the fact that the traffic upon them originated elsewhere, and it was a matter of no particular concern to those who would have to sustain the cost of repaving, whether the street was easily passable or not. The city government could of course order the repaving of the streets, but in an attempt to overcome this action, and yet restore the streets

to a more passable condition, it was decided to place asphaltic concrete strips, 16 ft. wide, down the center of streets on which no car tracks existed and two strips each 8 ft. wide on streets having car tracks.

The first plan was to fill up the holes over the area of the street occupied by the strip, first with a binder mix, then to add a 1-in. strip over the whole area, tapering the sides down to a feather edge. To do this work the streets were first well swept, which on account of the sand filler, left deep crevices between the rows of brick, furnished excellent clinches for the binder coat. The next step was to heat No. 54 Texaco asphalt to a liquid condition, and unite it with domestic distillate, which is the next heavier grade of oil below common coal oil, in the ratio of 40 per cent of the distillate, and 60 per cent of the asphalt. These were usually mixed in a half barrel and while hot poured into common house sprinkling cans. The workmen then started up and down the street at a moderate walking speed, pouring on the paint coat as they went, the result being that the entire street was covered with a very thin coat of this material, which took care of all the dust, entered the pores of the bricks, and put the street in fine condition for the asphalt work. This coat was allowed to dry for about 24 hours, depending upon the weather conditions. We considered it safe to apply the binder coat when the paint coat failed to leave any stain in the fingers when pressed against it.

Following the application of the paint coat, we applied the binder coat, with which we filled up the depressions and made the roadway generally suitable for an even thickness of the wearing surface. This binder coat, is made of a mixture known as a close bonder mix. This stone was graded down from a $\frac{3}{4}$ -in. size to a $\frac{1}{4}$ -in. size, then Joplin flint or "chats," together with three sand gradings were employed, and stone dust or portland cement used as the filler material.

The proportions used in making the binder coat will vary materially with the aggregates used, if the coarse rock is crusher run there will be a percentage of screenings in it, likewise the "chats" will vary as to fineness.

This binder when laid should be firm and tough after rolling, should show no "greasy" spots of harmful size, and yet should be to a certain extent porous, giving ample hold for the wearing surface to key to the binder coat.

The following is a mix for the binder coat used on this work which will average with our general practice, it being changed as conditions warranted, but withall giving a satisfactory product: Total weight of batch, 5,100 lb.; asphalt cement, 225 lb.; filler, 450 lb.; sand, all grades, 1,425 lb., and stone, 3,000 lb. From the above the percentage of each product may be derived. The exact amount of the

fine, medium, and coarse sand to use must be determined from the material at hand; as a start one may take a third of each, and vary from this as the indications of the mix demand. The binder should be of such toughness and mixture that it will not be disturbed by the twisting around upon it of the wagons and teams or trucks bringing in the wearing surface later.

After having applied the binder coat for about a day's run of the plant, the next day is devoted to the wearing surface. In laying these strips, as stated above, they were first laid thin, it being intended to make them only approximately an inch thick. Under this intention, the nature of the rough brick on the street made places where this strip was less than an inch thick, for we did not in this strip work lay a binder coat over the entire street to be covered by the strip. We used the binder coat only to level up the bad holes, or long depressions, hence when the roller came on the hot stuff it came near going through at the "peaks." Experience has taught us in this matter that it does not pay to lay this wearing surface less than 2 in. thick, especially in this strip work, for it must be kept in mind that as soon as these strips are laid, they receive the entire traffic of the street, and, where on car tracks streets we laid a strip each side of the car tracks 8 ft. in width, it confined the entire traffic to two narrow strips on each side of the main strip, about 18 in. in width, and this, together with the fact we made no especial provision for "headers," put a severe test on the strip work. We have found that certain kinds of traffic, for instance a 4-in. tire wagon hauling coal in July and August when the asphalt was at possibly 110 or 120° F., was able to make the mix "flow" in spite of everything, and eventually then to shear off from the main strip. In repairing these strips now we take care to make the strip full 2 in. thick, and we slope the sides down to the old brick paving at about a 45° slope. For the wearing surface, we use practically the same mix as we do for new work in asphaltic concrete, excepting that about 2 per cent more of asphalt is carried in the mix than is used in the regular new paving work.

Following the use of these strips, as above outlined, the residents of Topeka Ave. petitioned the Commission that their street be resurfaced with asphaltic concrete, in such manner as deemed advisable, but with the idea of making a permanent improvement. This petition was received and acted upon favorably, with the result plans and specifications were drawn in 1917 for the improvement. This street was also a 2-course brick construction paving, having been in service some 20 odd years. This street, like many others, had been dug into for various reasons, until its surface was well nigh impassable for pleasure carriages. This street is the choice residence street of the city, being reserved

from use by the street car system. All the street crossings were of the raised type, giving bridges across the gutters, the brick paving forming the gutters, and the curbs were built of red sand-stone.

Owing to the 2-in. of additional wearing surface expected to be placed on the present brick, it was designed that a new concrete gutter should be built next to the present curb, of 30 in. width, and 6-in. thickness being the depth of the wearing surface of the brick paving plus the sand cushion under it, leaving the first brick course in place as a foundation for the new gutter. The flow line of the gutter was made to conform to the flow line of the old brick gutter, but the outside edge was raised above the present brick level 2 in. to form a shoulder for the new wearing surface.

After construction of the new gutters, the raised crossings were removed, and where the removal required the cutting through of the first course of brick we supplied a concrete base for the new surface, but where we were able to leave in the first or flat course, we did, with the result that at the time of beginning the binder course our street was a series of large and small areas approximately 4 in. below the general level of the brick street surface. Over these places where we were leaving in the first or bottom course only, we swept these brick clean and grouted them well, likewise the many rough and uneven places in the street were treated in like manner.

The work of preparation being complete, the street was cleaned and the paint coat applied as above described, and later followed by the binder coat. The binder coat was used to level up all of these depressions created by the removal of the raised crossings, and the joining of this street to adjoin-

ing streets, also to take care of the many irregularities in the general contour of the street. This binder was made of substantially the same mix as described above, raked and rolled with the same care as would be used for surface coat, and left in condition for the reception of the wearing surface.

As a matter of street operation it was found better to lay binder coat for one day, then followed the next with wearing surface, the binder coat being kept from street traffic so that it would be perfectly clean. It will be seen the binder coat was in place 4 in. thick, but as these areas were small and surrounded with brick sidewalks, no trouble was anticipated and none has been found to take place.

In letting the contract we wrote our specifications and the contractors bid on a 2-in. wearing surface, and a 1-in. binder coat. We used the binder as needed, and upon such parts of the street as were in good surface condition, no binder was applied. We found upon closing up the job we had used a little less than the average 1-in. thickness of the binder over the entire street. We let this contract in the summer of 1917 at a cost of 90 ct. per square yard, which included the binder coat and the 2-in. wearing surface, the new gutter being extra, and the removal of all old surface extra. The following year we let three more blocks of the same work at a cost of \$1.10 per square yard. This street has been in constant use since its reconstruction, has carried probably 100 per cent more traffic than properly belongs to it, and at this time shows no signs of distress. Our people are very well satisfied, and we anticipate considerable more of the same class of work to be called for as soon as paving prices are returned to normal condition.

Giant Cement Statue, Engineering Skill

EDWIN TARRISSE, in the Philadelphia Record

PERHAPS one of the oddest pieces of sculpture in this country is the huge concrete statue of an American Indian which was dedicated some years ago at Oregon, Ill. It stands on Eagle's Nest bluff, 250 feet above the Rock river, and the figure itself is 43 feet in height. It rests on a 14 foot concrete pedestal, almost half of which is exposed, so that the figure with its visible base measures almost 50 feet.

The statue contains about two tons of twisted steel reinforcing rods and approximately 238 cubic

feet of concrete. The surface is mixed with pink granite screenings, giving it the appearance of a granite statue.

Four hundred and twelve barrels of Portland cement were used, and the mixture was as follows: For the base, one and five; for the pedestal, one and four; for the figure, one and three, and granite screenings, one to one and a half, mixed with a waterproofing compound.

As is customary, the idea of the new work was expressed in the form of a sketch model. The first

one was only eight inches high. The next size was two feet and the third size six feet. This last served as the working model. Then a system was devised by which the enlargement was made, which, when finished, was an exact duplicate of the six foot model increased seven times.

Selecting the Site.

In locating a site a 24 foot silhouette was built, which was found to be too small from the point of view desired. Then a light 24 foot structure was erected on a farm wagon, and the wagon was drawn around until the proper location was established. The site having been chosen, a square central tower was built to the height of 38 feet and anchored with guy ropes.

A section of the surface of the model could be enlarged on the ground and drawn up by a rope and nailed in place to correspond with the model. After all the points were made to correspond to the plan of the working model, wire netting was used for

the curves; this in turn was covered with 200 yards of burlap for a surface, the burlap being pinned to the wire with nails at close intervals.

A specially constructed derrick was used for the hoisting and setting of the temporary head, which had been previously modeled. After the head had been placed the figure was turned 15 degrees to the right to present a clearer profile from the bluff road. The final modeling was now done and the surface was given a thin coat of plaster to stiffen the burlap, and then a coat of clay water to insure its

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release from the mold later on. Both coatings were applied with a force pump.

Making the Mold.

The mold on the figure was now made of plaster and fiber. Every four or six square feet of the mold had independent bracing with strutting, cross bracing and hoops around the barrel-like structure, tending to equalize the outward strain imposed by the cement. The structure was built to shoulder level, the piece mold fitted to the head and neck and the two joined together in such a way as to be interlocking and self supporting.

Excavation was carried on at the same time that the mold was being made. While this was being done the figure was shored up by timbers from the solid rock 11 feet above the ground level. The central tower was retained as a scaffolding until the piece mold of the head had been fitted. The interior

was patched and cleaned and the interior of the mold was given two coats, one of wall size and one of paraffin grease; the former to keep the plaster mold from absorbing water from the cement and the latter to insure its release.

The remaining scaffolding was then taken out and a steel reinforcing tower, eight feet in diameter, was built in its place. This interior tower ended in a dome just below the neck and was designed to support the head and shoulders, which are of solid cement. The solid concrete base, measuring 18 feet square, was cast a little later.

A Single Breakdown.

The only breakdown occurred at 3 o'clock in the morning of the last day of the work. With the temperature below zero both engines suffered a temporary breakdown for half an hour and it all but froze the cement, which was then on a level with

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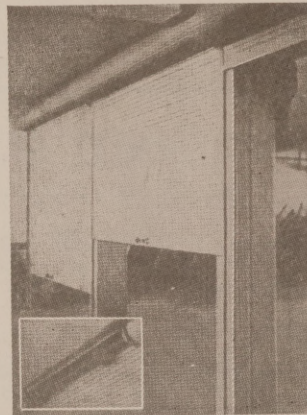


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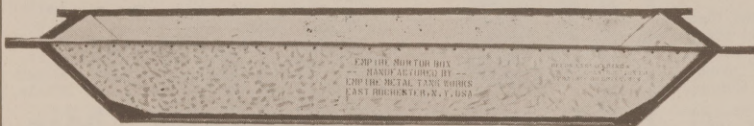
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the eyes. At this stage the cement was being passed up in pails. The last day of December at 2:45 in the afternoon the huge mold was full. Heat was applied for two days more, and then the Spirit of Black Hawk, as the statue is often called, was left to the elements until the following spring.

It is said the most exciting time in making a cement statue is the moment when the mold is about to be chopped off. Will it come out perfect or not? Needless to say, this part of the work in this instance had to be investigated as soon as the weather permitted.

In the early spring a party of three, including the designer, inspected the result of the work. The piece mold was taken off the head and shoulders. So far the results were found entirely satisfactory. Two weeks later the rest of the mold was taken off by splitting it from top to bottom and prying it off in huge slabs. At last there emerged a perfect—except for a few minor defects—Monolithic cement statue.

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A superior catalog, covering brass and bronze work, one which is valuable to architects, contractors, builders and supply dealers because it carries suggestions, plans and ideas throughout, has been compiled and is about to be issued by the Newman Manufacturing Co., Cincinnati, O. It shows reproductions of photographs of bank, theater and cafeteria installations, besides lists of standard and special articles in all metals manufactured at this plant. The distribution of this fine booklet has been delayed by a printers' strike in Cincinnati, and anyone interested should write for a copy immediately.

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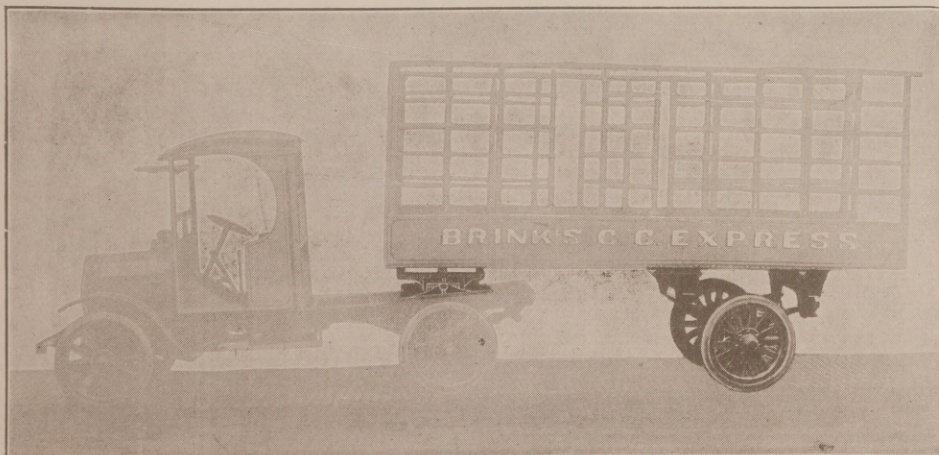
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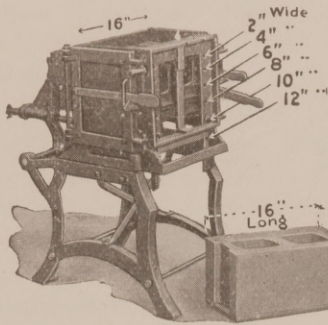
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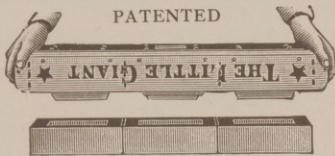
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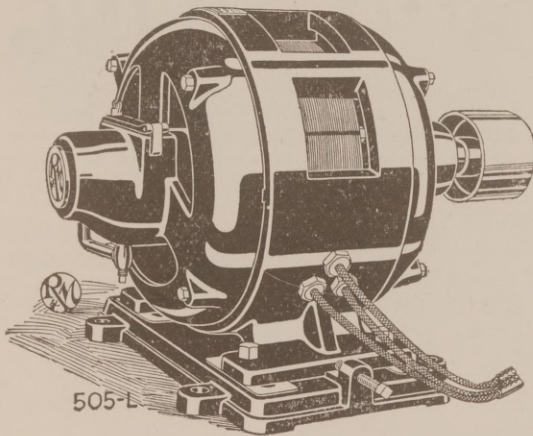
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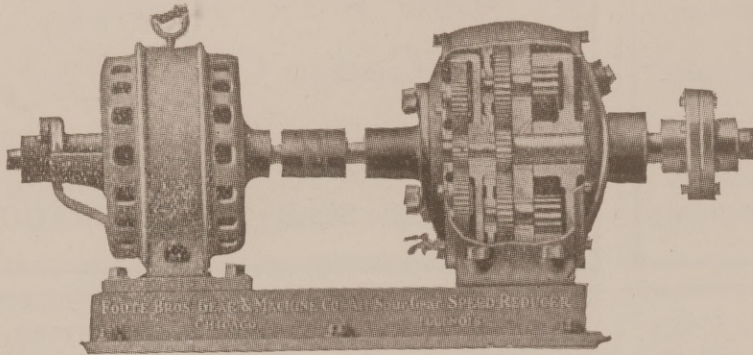
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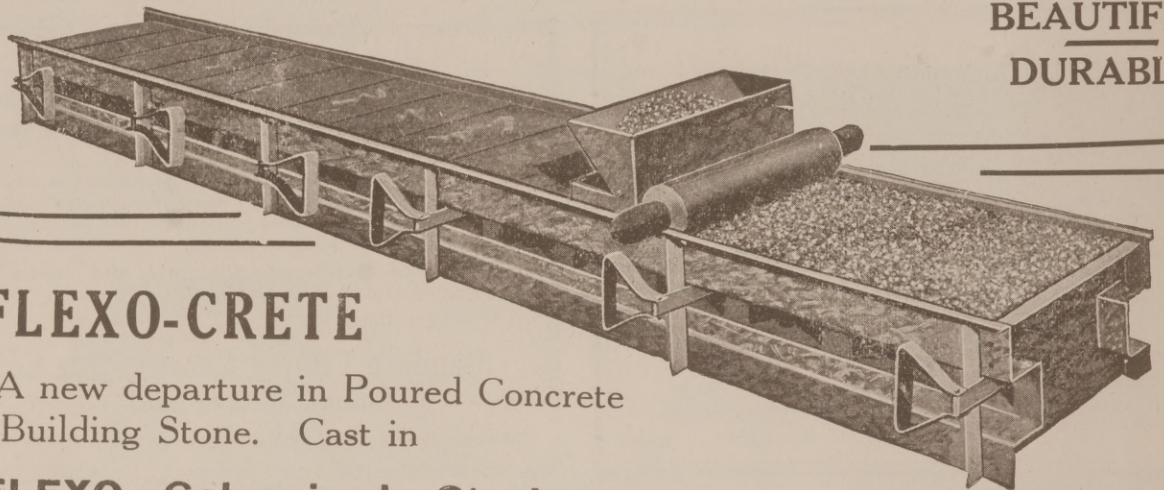
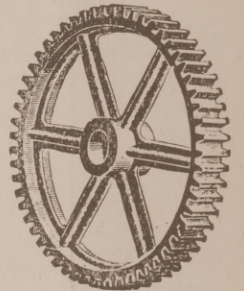
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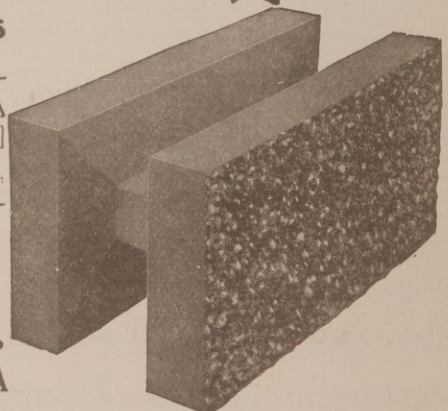
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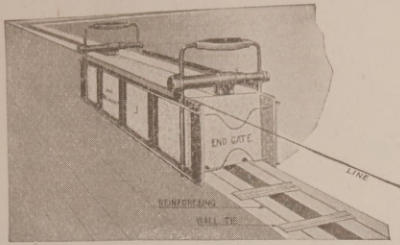
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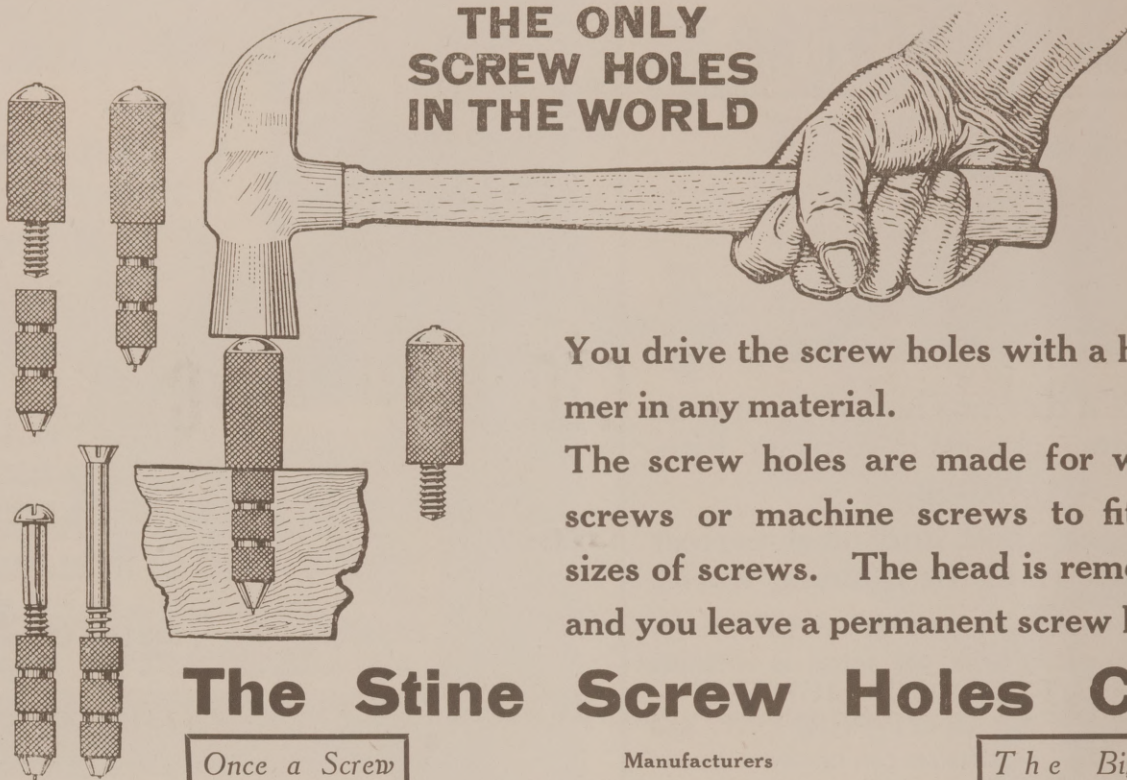
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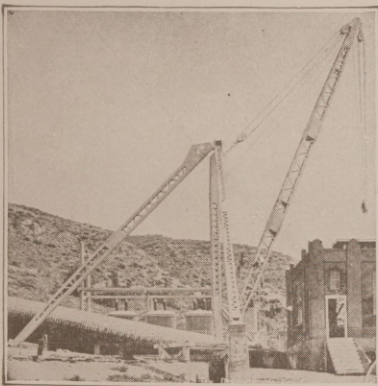
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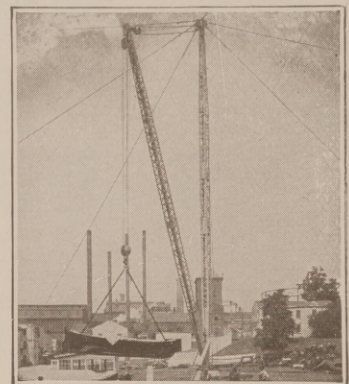
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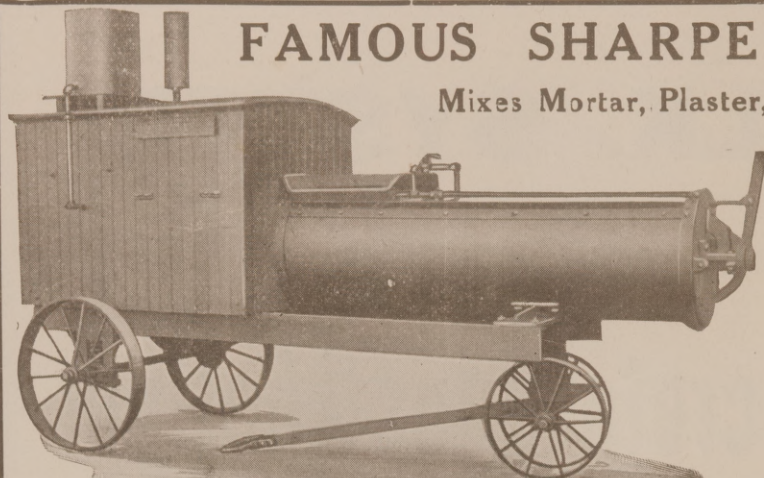
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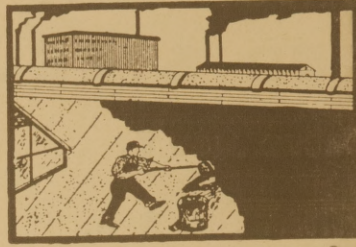
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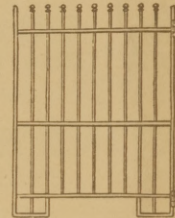
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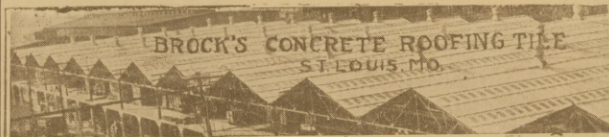


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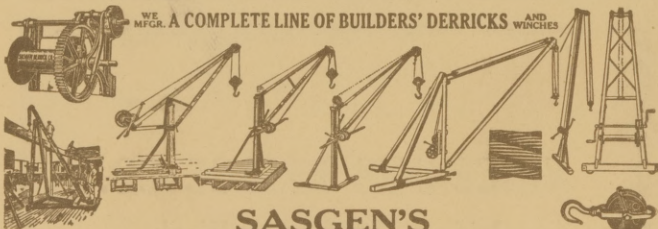
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