

# THE CONCRETE AGE

REPRESENTING THE INTERESTS OF MODERN PERMANENT CONSTRUCTION

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

VOL. XXXIII. MONTHLY DALTON and Atlanta, FEBRUARY, 1921. \$1.00 Per Year. No. 5

## 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.

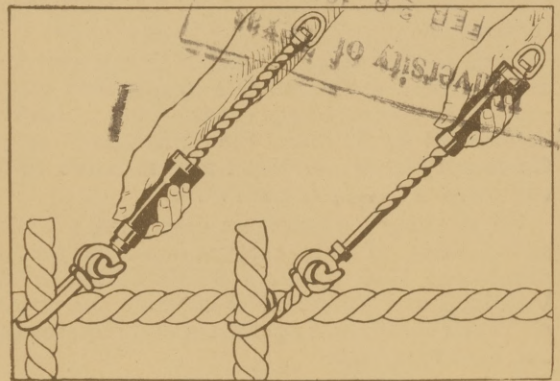
The same molds that form the standard block can be used for pouring the logs. Out in this country, houses built of concrete logs, poured in adjustable metal molds, are mighty popular.

*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.

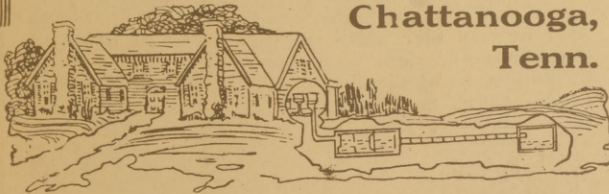
## SEPTIC TANKS

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.

## IRON PIPE RAILINGS

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

Dept. R.

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



# SAUERMAN DRAGLINE CABLEWAY EXCAVATORS

are widely used in developing  
local deposits of road gravel

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

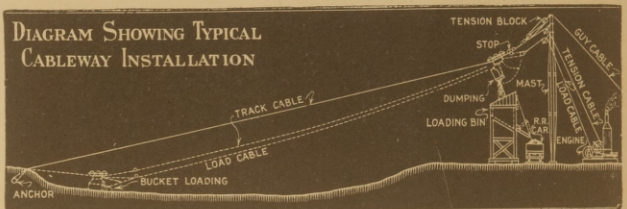
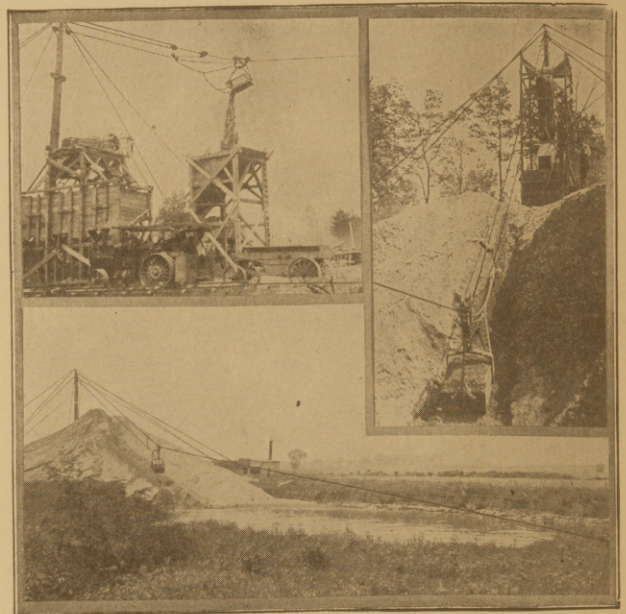
Sand and gravel producers, highway contractors and road commissioners in all parts of the country have proved the great saving which can be affected by installing the Sauerman Dragline Cableway Excavator when materials are to be rushed for a big job of road work.

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 Monadnock 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 carload or small shipments.

Our goods are made from the best material obtainable—and are guaranteed. Secure our inducements before placing your orders. We aim to give satisfaction. Prompt service and a square deal assured on all orders large or small.

A trial order will convince you.

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

We can furnish any quantity

SILO Rods  
Lugs

Wood or Steel  
Doors

Door Spreaders  
Reinforcements  
Reinforcing Steel,  
Twisted or  
Deformed  
Galv. Iron Chutes  
Metal Roofs  
Cement Stave  
Machines,  
Moulds, Etc.

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

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.

## ART WORK IN CONCRETE

Start a Business of Your Own.

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

FOR PARTICULARS ADDRESS

**ART STONE CO.**

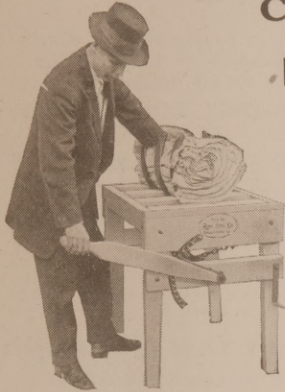
WAYNESBORO, PA.

Lock Box 400



## 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.

## Clean Your Sacks Handy Sack Baler Co.



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

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



### A TYPICAL CONCRETE HIGHWAY

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

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

## Dixie Portland Cement Company

James Building, Chattanooga, Tenn.  
**CONCRETE FOR PERMANENCE.**

## Machinery Covers are cheap insurance

Even though your equipment isn't laid up for long spells, it should be covered over the weekend to prevent tampering and theft of parts. Sound construction and careful treatment give U. S. T. & A. tarpaulins long wear. They stand rough handling. Absolutely waterproof.

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

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

**UNITED STATES TENT & AWNING CO.**

227 N. Desplains St. Chicago, Ill.



## Buy Kramer Equipment

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

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

Investigate. Prices on request.

### Kramer Automatic Tamper Co.

Kelley Street, Peoria Heights  
PEORIA, ILL.

## Quality Higher Than the Price

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

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

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

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

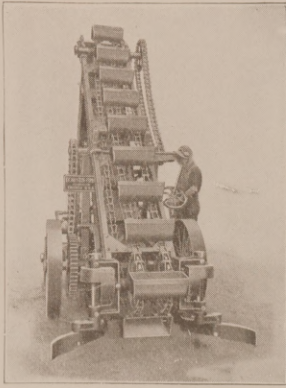
Our Prices will surprise you. Send for Catalogue today.

**BURRELL MFG. & SUPPLY HOUSE**

Box Y-86 Kankakee, Ill.







## AUSTIN Self-Feeding Wagon Loader

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

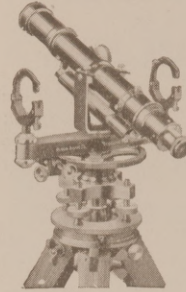
handling of material in concrete road and building construction, excavation work, quarry, storage and reclaiming plants and coal and material yards.

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

### F. C. AUSTIN MACHINERY CO.

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

### No Up-to-Date Builder



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

#### "STERLING" CONVERTIBLE LEVEL

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

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

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

Vest Pocket Manual of Adjustments Free.

### Wet Mix Concrete Men, Attention!

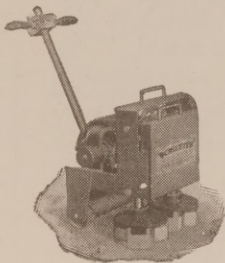
"McAdamite" is something new. Nothing like it on the market. Absolutely prevents cement from sticking to the forms and product comes out with a smooth, glossy surface, resembling the work of a trowel. Saves more than the price of other oils in labor. Gallon lots \$1.25 per gallon. Five gallons or more,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

### McADAM CEMENT WORKS

315 E. 5th Street

Aledo, Illinois

### The IMPROVED Rapid Floor Surfacer



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

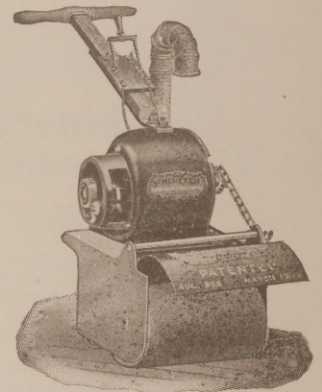
Send for our free trial offer.

#### 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

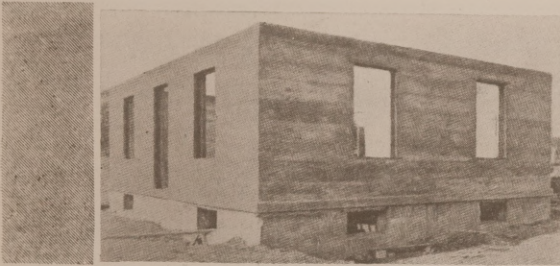
Write or Wire for Prices.

We Want Wide-Awake Jobbers.

## The Starks Manufacturing Co.

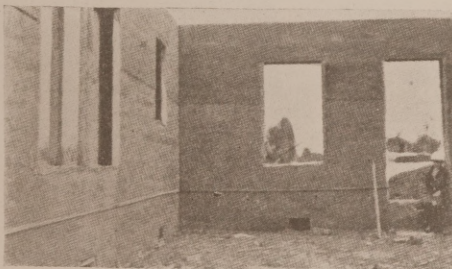
First and Main Sts.

Kansas City, Mo.



# ACME

## Hollow Wall System

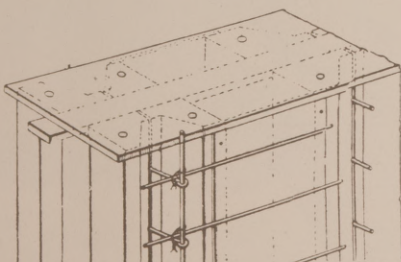


Speed and low-cost in building hollow walls—your bid low enough to get the business—high enough to make good money—and the speed gets you away to the next job in a hurry. That's how the Acme System works.

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** **IRON** **WORKS**  
 PHILADELPHIA NEW YORK 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



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

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

### Multiple Oval Cores allow use of Wet Mixed Concrete

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

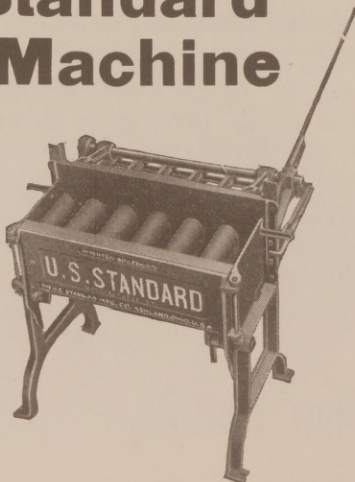
Our coring system allows for plenty of wall ventilation giving air space from top to bottom of wall.

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

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

## U. S. Standard Block Machine

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



**U. S. Standard  
Manufactring  
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

Vol. XXXIII.

DALTON and Atlanta GEORGIA, February, 1921

No. 5

## THE CONCRETE AGE

PUBLISHED MONTHLY

Devoted to Modern Permanent Construction.

CONCRETE AGE PUBLISHING CO.

### SUBSCRIPTION RATES.

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

Advertising rates given upon application.

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

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

### TO OUR ADVERTISERS.

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

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

### TABLE OF CONTENTS.

Editorial .....	7-8
Street and Road Construction .....	10
Good Roads Association to Meet .....	13
American Engineering Council Meeting .....	13
"Ship Early" Campaign On .....	15
Agricultural Engineers for Standardization ....	16
Gypsum Plaster as Fire Protection .....	17
Building Demand Accumulates .....	19
New Cement Products Plants .....	21
Back Plastered Cement Stucco .....	22
Carefully Planned Rural Homes .....	24

### Honest Dissatisfaction With Job.

At a recent meeting with the employers of the National Cash Register Company, John H. Patterson, the veteran President of the Company, who is now taking a well earned rest in Europe, made the following statement in an address incidental to the presentation of prizes to the winners in the Company's annual Suggestion Contest:

"Some years ago, in conversation with a preacher, I was asked this question: 'What is your greatest trouble?' My reply was that my greatest trouble was in getting employees at the factory to co-operate with me in improving conditions. The preacher countered with this suggestion: 'You have 3,000 employes, with 6,000 eyes and 6,000 ears and 3,000 brains; they see more, hear more and think more—many times more than you can possibly do—ask them to help you, and make it worth their while!'

"I followed his advice, and as a result, these great annual Suggestion Contests have been so successful that we have received over 66,000 suggestions in eight years of which 23,000 were adopted, and in 1920 eleven hundred and seventy-eight persons received altogether \$7,995.00 in prizes."

Mr. Patterson was dissatisfied with his job eight years ago. He was under the impression that he could not induce his employes to co-operate in the proper manner with him, that they did not take sufficient interest in the business to think about it "after hours," or even during business or work hours, so far as studying out means by which improvements might be made.

He was honest about it, and, somehow, he could not stop thinking about this trouble.

From an entire outsider, a man who was not supposed to know anything about business, came the suggestion that overcame the trouble.

There is probably not a contractor nor a cement plant, nor any other employer of men in a commercial, industrial or financial enterprise, who has not at some time thought the same way as Mr. Patterson. And yet, the remedy is so close by that it is a wonder so few people have recognized that it lies within themselves.

Make it an object for your employes to think about your business "after hours," and while at work; either by some plan like the Suggestion Con-



test, or by direct payment for any suggestion for improvement which is adopted as is done by Marshall Field & Company, and other successful merchants.

You may be inclined to blame your employes for lack of interest in the progress of your enterprise, but do you really take much interest in their progress, except to the extent of a more or less heated correction and verbal castigation when they have done something you do not consider proper?

Mr. Patterson made a lot of his employes honestly dissatisfied with their jobs, with the result that his business was greatly improved, in the matter of profits as well as in the matter of better relations between the management and the employees—which latter is fully as important as the former. Wouldn't it be worth your while to make John honestly dissatisfied with his job?

#### Personality in Publicity.

Put yourself into your advertisements. Personality counts most, even in big business. It is vital in contracting and building where customers come into direct relation with the builder. Marshall Field in Chicago and John Wanamaker in Philadelphia are examples of success built upon personality.

An impersonal advertisement is too much like a railroad timetable. It does not create good will for the advertiser. There is no friendliness in it. The customers who keep on coming to you at your office are the people who like you. If they didn't like you, they would not come often.

#### Repairing Leaks in Concrete With Bran.

Two sub-surface concrete tanks which had been leaking badly were effectively sealed by the use of bran, according to information furnished the Canadian Engineer by a correspondent. The tanks in question measured 20 ft. in length by 10 ft. wide and 18 ft. in depth. The walls and floors were of reinforced concrete and were 10 in. thick at the top. Plastering of the inside faces of the tanks, which are built into the ground, proved to be of no use, as the water leaking from the outside washed the cement away as soon as it was applied; therefore some other way of making the tanks watertight had to be devised.

The following process was then tried with remarkable success. The tanks were filled with water, and the pressure being greater on the inside faces than the outside, the water ran out through the leaks to quite an extent. Ordinary bran was used as a sealing material. The surface of the water all around the walls for a width of about 1 ft., was covered with bran. This bran floats for some time until it takes a gluish form, when it starts to sink, but very slowly, and in going down following the sides of the walls, the sticking substance is naturally

drawn towards the holes into which it deposits itself, being forced in by the pressure of the head of water in the tank.

The operation was repeated until the tanks were made absolutely watertight. They have now been in use since November, 1919, and have not leaked at all since.

#### Why it is Important to Ship Now.

Mr. Daniel Willard, president of the Baltimore and Ohio Railroad, writing in the *Railway Age* in its issue of January 7, has this to say in his advocacy of "shipping now," and this is particularly applicable to the movement of cement. He says:

"While it is true that there is a surplus of transportation facilities, particularly box cars and freight locomotives, in the United States today, it does not by any means follow that such will be the case two or three months from now. As a matter of fact, having in mind that a large portion of the wheat crop is still in the interior of the country; that we raised this year one of the largest corn crops ever raised; and further, that funds have actually been provided for a very substantial program of road building during the year 1921, I repeat, for these reasons and others I cannot help feeling that the transportation facilities of the railroads will be fully used by March or April.

"In order to avoid possible delays which might be experienced at that time because of the active demand for cars, I think it is highly desirable not only from the standpoint of the railroads but in the public interest, that whenever possible and as much as possible, advantage be taken of the surplus facilities now, to ship in anticipation of the wants later on.

"I am inclined to believe that the railroads with their existing facilities could perhaps handle all the business offered during a twelve months' period, providing it were offered uniformly through the entire period, but that of course is exactly what does not happen, and it is certain that the railroads with their present facilities are not able to take care of the possible peak loads, and this is why I think it is wise to urge upon all who can do so to ship now."

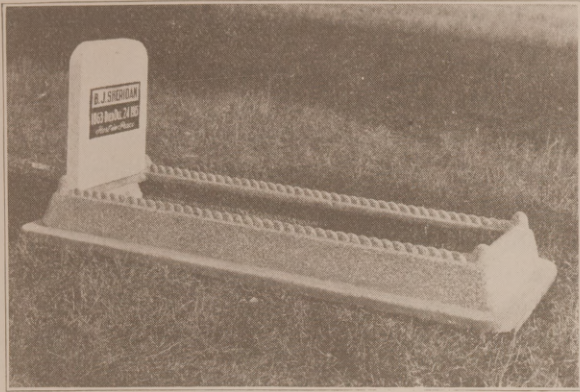
In view of the above statement, The Concrete Age would respectfully urge all who has to do with the movement of cement and other building materials to act now.

#### Tallest Concrete Structure.

According to an Eastern exchange, the Arcade building in St. Louis is the tallest concrete building in the world, being seventeen stories in height above ground with two additional stories beneath the surface.



## 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)

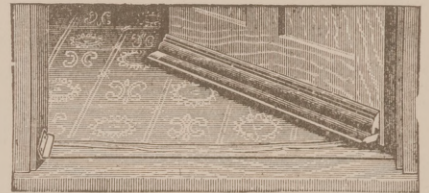
for the bottom of doors and hinged windows. It's automatic. Fits down tight against worn sills as well as new ones. Keeps out every bit of cold, snow and rain and dust. Saves fuel. Sells fast; everybody wants it for economy's sake. Simple; easy to put on. Approved by architects, carpenters, and builders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

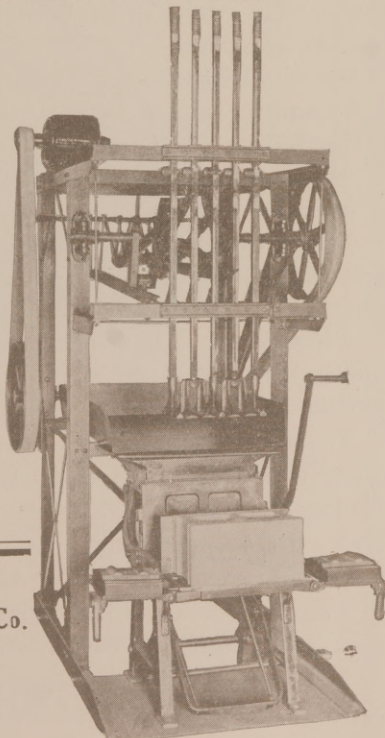
In severe tests, Perfect Concrete Brick have proven stronger than common clay and pressed clay brick.

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

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

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

## Road and Street Construction.

Anniston, Ala.—City, H. B. Rudisill, Mayor, introduces ordinances covering paving on 12 mi. streets with asphaltic concrete, bitulithic or brick on reconstructed base; cost \$600,000; bids about Feb. 25; Robert L. Totten, Conslt. Engr., Birmingham, Ala.

Birmingham, Ala.—Jefferson County Commissioners will hard-surface 20th St.; invites bids.

Gadsden, Ala.—City will rebuild streets; tarvia and other road bituminous surfacing material. Address The Mayor.

Washington, D. C.—Navy Dept., Bureau of Yards and Docks, let contract to G. B. Mullin & Co., Contrs., 330' 11th St., to construct paving and draining, build retaining wall and electric duct system at Navy-yard.

Port Pierce, Fla.—State Road Dept., Forest Lake, Chrmn., Tallahassee, Fla., received and opened bids of Ackerman Construction Co., Titusville, Fla., on the construction 9.55 mi. State-aid road No. 7 between St. Lucie County line and Okeechobee City; Chas. A. Browne, State Highway Engr., Tallahassee, Fla.

Jacksonville, Fla.—City Comsn. plans sidewalks in Hemming Park.

Jacksonville, Fla.—City Comsn., John S. Bond, Chrmn. will pave streets; vote Mar. 1 on postive issue of \$100,000, and tentative issue \$150,000.

Perry, Fla.—Town, Aulay McAulay, Clk., will construct 37,000 sq. yds. street paving, etc.; bids until Feb. 24; H. S. Jaudon Engineering Co., Engr., Elberton, Ga.

St. Petersburg, Fla.—City, G. B. Shepard, Director of Finance, will construct 800 lin. ft. sidewalks along north side yacht basin; H. A. Farmer Concrete Co., Contr.

Cartersville, Ga.—City plans street improve ments. Address The Mayor.

Cedartown, Ga.—Polk County Commrs. will im-

prove roads; issue \$500,000 bonds.

Cedartown, Ga.—Polk County Commrs. Roads and Revenues, Whit K. Russell, Chrmn., will construct 6.5 mi. road grading and sand-clay surfacing; Federal-aid Project No. 165; \$34,884; Stanley-Singer Co., Contr., LaFayette, Ala.; A. A. Simonton, Div. Engr., Cedartown.

Lyons, Ga.—Toombs County Commrs. have under construction road from Vidalia to Mt. Vernon and from Vidalia to Lyons.

Savannah, Ga.—City, Director Public Works, J. W. Motte, will pave W. Broad, Whiteaker and Drayton Sts.; 75,338 sq. yds.; low bidders, Dixon Contracting Co. and Hutton Engineering & Construction Co., both Savannah, at \$111,321.

Newport, Ky.—Campbell County Commrs. will construct 2 mi. waterbound macadam road; \$12,000 available; bids about April; Roland R. Pyne, County Engr. Lately noted.

Owensboro, Ky.—City, John C. Calhoun, Mayor, will improve Locust St.; construction in spring; E. B. Shifley, Structural Engr.

Alexandria, La.—Rapids Parish Police Jury J. F. Ball, Prest., will clear and grade and construct culverts on 9 mi. Glenmora-Westport highway; bids until Feb. 8; Ira W. Sylvester, Parish Engr.

New Iberia, La.—Highway Dept., Board State Engrs., 332 Maison Blanche Annex, New Orleans, La., will construct 4.60 mi. New Iberia-Burke Highway, Iberia Parish; \$58,772.45; A. E. Perry, Contr., Colfax, La.; Duncan Buie, State Highway Engr., New Orleans, La.

Forest, Miss.—Scott County Commrs. Dist. No. 1 will improve and construct roads; \$110,000; will invite Bids.

Ripley, Miss.—Tippah County Supvrs. will construct roads; contracts let.

Cape Girardeau, Mo.—City, H. H. Haas, Mayor, will pave streets; bids about Feb. 15; Ed. Eiler, Engr.

Charleston, Mo.—Board Public Works, Mr. Smith, Secy., will pave streets; bids in March; L. T. Bertha Engineering Co., Engr., House Bldg.

Oseola, Mo.—St. Clair County, David O. Thomas, Supt. Highway, will receive bids until Jan. 28 on paving 3 mi. Mascoutah road. Section No. 28; concrete; State is planning to let contract within next month for paving Mascoutah-New Memphis road.

Charlotte, N. C.—City Commrs. plan paving Crescent Ave.; 15-ft. driveways, etc.

Lillington, N. C.—Harnett County Commissioners will expend \$500,000 in constructing highways.



Lumberton, N. C.—City plans to issue \$182,000 bonds for street paving and sewer extension. Address The Mayor.

Raleigh, N. C.—D. Allen & Co. let contract to Elliot & Showles, Durham, N. C., for paving and draining various streets in Hayes-Barton.

Sylva, N. C.—Jackson County Commrs. will construct road from Sylva to South Carolina line.

Washington, N. C.—Beaufort County Commissioners will hard-surface roads; 10 mi.; \$400,000 available; Gilbert C. White, Engr., Durham, N. C.

Washington, N. C.—City will construct 65,500 sq. yds. vitrified brick or sheet asphalt paving; bids until Feb. 10; P. C. Painter, City Engr.

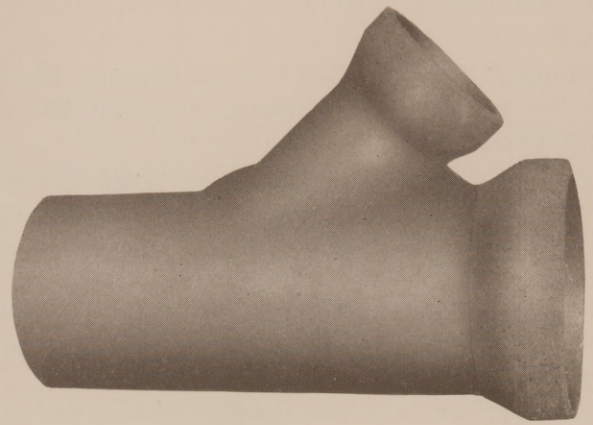
Winston-Salem, N. C.—Forsyth County Commrs. plans voting on \$2,000,000 bonds for roads.

Ardmore, Okla.—Carter County Commrs. plan gravel road on proposed Lone Grove-Healdton Rd.; 16 mi.; bids opened.

Duncan, Okla.—City Commrs., R. W. Cline, City Mgr., will pave streets and construct storm sewers; \$750,000; Johnson & Benham, Conslt. Engrs., Firestone Bldg., Kansas City, Mo.

Eufaula, Okla.—State Highway Dept., Oklahoma City, Okla., will construct 23 mi. Jefferson highway through McIntosh County; gravel; \$354,427.60; A. A. Davis, Contr., Oklahoma City, Okla.

Knoxville, Tenn.—State Dept. Highways, Nashville, Tenn., will construct 12.76 mi. State Highway



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Balinger, Tex.—Runnels County Commrs. Road Dist. No. 2 will construct roads; vote Feb. 26 on \$100,000 bonds.

Beeville, Tex.—City will construct 14,340 sq. yds. paving; 6-in. reinforced concrete base, with 1-in. asphalt topping; bids opened Jan. 25; Roy Fenner, City Engr.

Childress, Tex.—Childress County Comrs. will construct highway from Childress north to Red River; \$70,000; contract let.

Coleman, Tex.—Coleman County Commrs. will invite bids on  $6\frac{3}{4}$  mi. Coleman-Goldbush road; gravelled hard surface; \$215,000 available; contemplate \$300,000 Federal and State aid.

Coleman, Tex.—Coleman County, L. G. Mathews, County Judge, will construct 6.78 mi. gravel road, concrete drainage structures, etc., on Coleman-Goldbush road; bids until Jan. 31; W. E. Dickerson, County Engr. Lately noted.

Corpus Christi, Tex.—Nueces County Commissioners, H. R. Southerland, County Judge, will grade and drain 5.51 mi. Robstown-Calallen road; construction by county; O. N. Powell, County Engr.

El Paso, Tex.—J. E. Macon of Macon Realty Co., 612 Mills Bldg., will pave streets.

Fort Worth, Tex.—City will repair paving on streets; \$20,300; J. F. Wills, Contr.; D. L. Lewis, City Engr.

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

Hillsboro, Tex.—Hill County Commrs. will grade and drain 9.9 mi. State Highway 2A, Colorado Gulf Highway from Johnson County to Precinct 1 and 2; Bryant & Huffman, Engrs., 211 Littlefield Bldg., Austin, Tex.

Lipscomb, Tex.—Lipscomb County Commrs. will improve road.

Milam, Tex.—Cameron County Commrs. will construct roads on State Highway No. 36 through Road Dists. No. 2 and 29; A. F. Mitchell, Engr.

Ochiltree, Tex.—Ochiltree County Commrs. will regrade road.

Pittsburg, Tex.—Camp County Commrs., J. A. Efrud, County Judge, will grade, drain and surface 9.92 mi. State Highway No. 5; Wilder & O'Neil, Engrs., Mt. Peasant, Tex.

Plainview, Tex.—Hale County Commrs., Plainview, Tex., and Briscoe County Commissioners, Silvertown, Tex., will construct 46 mi. National Bankhead highway; graded road; Lewis Griffin, or E. H. Perry, in charge; G. M. Phelps, Engr.; all Plainview.

San Antonio, Tex.—Bexar County Commrs., Augustus McCloskey, Judge, will grade and surface 5.1 mi. Bandera Road; bituminous macadam highway;

\$60,911.20; contract to J. E. Thompson for concrete work, Uvalde Co. for bituminous stopping and Bexar County for gravel and grading.

San Antonio, Tex.—Bexar County Commrs., Augustus McCloskey, County Judge, will surface 4.25 mi. Gonzales road with 1 in. bituminous topping; 40,000 sq. yds.; \$27,200; Uvalde Rock Asphalt Co., Contr.; C. E. Hoff, County Engr.

Sinton, Tex.—San Patricio County Commrs., J. C. Houts, County Judge, has approved plans for constructing 15.1 mi. road in Road Dist. No. 1; surface with gravel; Federal Aid Project No. 180B; construction by county; A. C. Pancoast, County Engr.

Sonora, Tex.—Sutton County Commrs., L. W. Elliott, County Judge, will construct 10 mi. State Highway No. 4 from Schleicher County south through Sonora; cost \$150,000; \$400,000 available; Vaughn & Foster Co., County Engrs.

Stamford, Tex.—City plans grading and graveling streets. Address The Mayor.

Stanton, Tex.—Martin County Commrs. contemplates constructing 12 mi. gravel surfaced road on State Highway No. 1; \$120,000; R. W. Baker, County Engr.

Tyler, Tex.—City, H. J. Graeser, City Mgr., will macadam streets; \$30,000; construction by city; Sam Bathwell, City Engr.

Waxahachie, Tex.—Ellis County Commrs. will improve road as follows: Gravel surface  $2\frac{3}{4}$  mi. Ennis-Crisp Rd.; 2 mi. Ennis-Italy Rd.; 7 mi. Ennis-Emhouse Rd.;  $8\frac{1}{2}$  mi. Ennis-Waxahachie Rd.; bids until Jan. 27; G. G. Edwards, Engr., Ennis National Bank Bldg., Ennis, Tex.

Wellington, Tex.—Collingsworth County Commrs. will regrade road.

Lynchburg, Va.—City, E. A. Beck, City Mgr., will pave Church St.; 12,000 yds. brick, sheet asphalt or concrete; bids until Jan. 29; B. A. Bennett, Engr. Supersedes recent item.

Martinsville, Va.—Town, A. S. Gravely, Clk., will pave streets; voted \$200,000 bonds.

Portsmouth, Va.—State Highway Comsn., Richmond, Va., will construct Portsmouth-Suffolk highway; invites bids.

Charleston, W. Va.—Kanawha County Commissioners, S. E. Childress, Prest., will grade roads in Elk Dist.; 20,000 ft.; culverts, bridges, etc.; bids until Feb. 12; F. G. Burdett, County Road Engr.

Spenser, W. Va.—Roane County Commrs. will grade and drain 2.5 mi. Spencer-Clendenin roads, 26 ft. wide; Calvin, Coleman & Powers, Contrs., Walton, W. Va.

#### University Has Special Course in Highway Engineering.

In order to meet the demand for trained highway engineers the University of Tennessee, in cooperation with the Department of Highways, has



established a short course in engineering during the dull period of road construction, particularly for men who have had previous engineering experience, but other persons are admitted. It is believed that by taking one or two such courses highway engineers can greatly improve their efficiency and be able to take more responsible positions.

To those who have not had engineering experience elementary courses are given in mathematics and surveying. The main course consists of surveying, construction and maintenance of highways, testing materials for road work and highway economics and organization. In addition to the regular class work specialists are invited to speak on the various phases of highway work and give the persons taking the course opportunity to hear the subject presented from the viewpoint of practical engineers.

This course was started several years ago, and since then it has grown in importance. The enrollment is now large and is rapidly increasing.

#### Cement Specifications Australian Cities.

Detailed specifications for Portland cement used by the Victorian Public Works Department have been furnished by Vice Council McCafferty, of Melbourne. The cement must be of the best quality, of a dark gray color, uniformly burnt, finely and evenly ground, and samples must average at least 116 pounds per bushel in weight. It must be of a fineness to pass through a sieve having 2,500 meshes to the square inch. Sample briquets placed in water 24 hours after gauging must bear the following tensile strains in an approved testing machine: 43 hours after gauging, 160 pounds per square inch; 4 days after gauging, 250 pounds per square inch; 7 days after gauging 400 pounds per square inch.

Through the above source it is learned that cement for the Melbourne and Metropolitan Board of Works must be composed of: Lime, 58 to 64 per cent; silica, 20 to 27 per cent; alumina, 5 to 10 per cent; oxide of iron, not more than 6 per cent; magnesia, not more than 3 per cent; and sulphuric acid, not more than 2 per cent. The cement must be well burnt and finely ground, so that 95 per cent may pass through a sieve of 2,500 meshes to the square inch and 80 per cent through a sieve of 17,000 meshes to the square inch. Sample briquets, after immersion in water for 7 days, must give an average tensile strength of not less than 450 pounds per square inch, and after 28 days must show an increase in tensile strength.

#### Good Roads Association to Meet at Greensboro, N. C.

Governor Chas. H. Brough, president, and J. A. Rountree, director-general, of the United States Good Road Association have issued an official call that the Ninth Annual Convention of the United States

Good Roads Association will meet in Greensboro, N. C., April 18 to April 23, inclusive.

All organizations interested in good roads have been requested to appoint delegates that will attend this convention, which promises to be the most important since the good-roads agitation was started.

The Bankhead Federal-aid appropriation will cease in June if Congress does not re-enact the measure. This convention will take steps to urge Congress to pass the measure. Action endorsing a system of national highways will be taken.

In connection with the meeting the United States Good Roads Exhibit will be held. Many new types of road-building machinery and highway transportation equipment, road materials, machinery and equipment used in construction and maintenance of roads and pavements will be shown. A select number of automobiles, trucks and tractors will also be shown.

The Road Department at Washington is expected to have an exhibit that is worthy of the Government.

During "Good Roads Week" the Bankhead National Highway Association, which has members in 13 States, will hold its fifth annual meeting in Greensboro. This association will have at least 1000 delegates in attendance. Invitations have been extended to other highway and subsidiary organizations to hold meetings and conferences during the week.

Director-General Rountree, who has charge of the executive affairs of the United States Good Roads Association and the Bankhead National Highway Association, will go to Greensboro, N. C., early in February with a staff of assistants and open headquarters, where he will remain for the next 90 days promoting these three great meetings.

Governor Brough, president of the United States Good Roads Association, expects to visit a number of the Governors in more than a dozen States, personally inviting them to attend the convention and deliver addresses, also to see that good delegations attend the meeting from their respective States.

#### Colorado Springs Retain Blanchard.

Arthur H. Blanchard, M. Am. Soc. C. E., Consulting Highway and Transport Engineer, Ann Arbor, Mich., has been retained by the City of Colorado Springs in connection with its \$1,200,000 paving program.

#### American Engineering Council Meeting.

Meeting was called to order by the President, Herbert Hoover, December 17. Every member of the Board was present, except Professor Arthur M. Greene, who wired his regrets.

District No. 1 (New York and New England States) selected for their representative, Mr. W. B. Powell of the Buffalo Engineering Society. District



No. 2 (Michigan, Wisconsin and Minnesota) selected as their representative on the Executive Board, Gardner S. Williams of the Detroit Engineering Society.

#### **Committee to Nominate Secretary.**

Committee was not ready to report and asked for further time which was granted.

#### **Appointment of Standing Committees**

The President announced that he had appointed Standing Committees as approved in the By-Laws. (See appendix.)

President Hoover also reported on visits he had made to various cities—Providence, Boston, Des Moines and Chicago. The trips were made to these cities in connection with other work, and Mr. Hoover called the engineers in these localities together and spoke to them on the Federation. His impression, gained from contact with engineers in all parts of the country, was that it was the general desire of engineers everywhere to join The Federated American Engineering Societies. The trend was for territorial organization first and then national organization. Attention was called to the fact that a Massachusetts Engineering Society is being formed; in Minnesota there has already been formed a state organization of engineers and architects, and various other states are contemplating similar action. The Executive Board authorized the appointment of a standing committee whose general problem will be that of developing a relationship of engineers in local affiliations and state affiliations (Articles VII and VIII of the Constitution) this committee to have wide national distribution and to include representatives from states where State Councils have already been established.

#### **Engineering Council.**

Engineering Council held a meeting in Washington on December 16th and passed a resolution that it be discontinued after December 31, 1920. (See appendix 2.)

In conformity with the resolutions adopted at that meeting, the American Engineering Council voted to authorize the President to appoint the present committees of Engineering Council which otherwise would cease to function on Dec. 31. The attitude of the representatives of the Civil Engineers in helping to disband the present Engineering Council was most admirable, when it is considered that their Society is not a member of American Engineering Council.

#### **Employment Service Bureau.**

The American Engineering Council voted to take over the Employment Bureau now operated by the Founder Societies, and instructed their Committee on Procedure to outline a plan of organization.

#### **Reports of Standing Committees.**

**Publicity and Publications Committee:** A small appropriation was made to this Committee for pub-

licity work and the Committee was authorized to appoint a Co-operating Board of Engineering Editors. Dr. L. P. Alford is Chairman of the committee.

#### **Committee on Membership and Representation.**

(Mr. John F. Oberlin, Chairman.)

The question of the grades of membership on which Members-Societies should base their dues was referred jointly to the Finance Committee and the Membership Committee, they in turn to make their recommendations to the Treasurer so he can send out the bills for the first quarter, 1921.

#### **Committee on Finance.**

(Wm. McLellan, Chairman.)

Committee reported on various routine matters such as payment of bills, bond for treasurer, etc. They also recommended that the actual expenditures made by of the Board for attendance at Board meetings be paid by the Treasurer.

#### **Committee on Public Affairs.**

(J. Parke Channing, Chairman.)

Committee recommended cooperation with the National Department of Public Works Association. Their recommendation was approved.

Another resolution, adopted by the Council, presented by this Committee was as follows;

“American Engineering Council recognizes the fact that the activities of the technical bureaus of the Federal Government are of fundamental importance in the development of our economic resources and recommends that great care and careful discrimination be exercised in any reduction that may be considered necessary.”

#### **Committee on Constitution and By-Laws.**

(W. B. Powell, Chairman.)

This Committee was requested to suggest an amendment to the By-laws so that membership of committees could be drawn from other than member-societies.

#### **Membership in Chamber of Commerce.**

The Board voted that it did not desire to become a member of The Chamber of Commerce, but that it would be glad to cooperate with them at any time and give them advice on any questions that may arise.

#### **Letters From American Association of Engineers.**

The Secretary presented communication from the American Association of Engineers.

The first communication asked American Engineering Council to send a representative to a national conference on engineering publicity, which the American Association of Engineers proposed to hold in February, 1921. It was the sense of the meeting that while American Engineering Council would be glad to cooperate with other engineering organizations, they were not yet sufficiently organized to send a representative to this conference.



# "Ship Early" and Ease the Peak Load

By R. H. AISHTON, President of the American Railway Association.

(Railway Age.)

FOR the first time in five years, on this January 1, 1921, there is a surplus of transportation in the United States, and the transportation machine is not being worked to its capacity. Two things have brought about this condition:

First: The combined co-operative efforts of the railway staff, shippers and public bodies whereby the average car loading has increased from 28.3 tons in February, 1920, to 30.0 tons in November, 1920, and average miles per car per day have increased from 22.0 in February, 1920, to 28.0 in November, 1920, the net practical results attained automatically approximately adding 500,000 cars to the equipment without any additional capital investment.

Second: Shipments have decreased through the shutdown or curtailment of industry; uncertainty of commodity prices has restricted buying; credit conditions have restricted building operations; the situation regarding foreign exchange and the inability of foreign nations to finance purchases have reduced exports, all bringing about a lessened demand for transportation.

As a result, on the one hand of the improved efficiency of the railroads in handling the freight offered, and on the other of the decrease in the volume of business demanding transportation, there is for the first time in years, except for a short time in 1919, a surplus of cars and locomotives above requirements and not actively working to their capacity. This condition is not without precedent, although seldom, if ever, has the transition from insufficient transportation to a surplus of that commodity come as suddenly and violently as in the past few months and as the decline was sudden, violent and deep, so may we, if past history is any indication, predict a rebound of the same character.

Never before has the interest of the shipper, the public as represented by the Interstate Commerce Commission and the railroads and their owners and officers been so mutual as now. What can be done to meet this future revival of business in addition to what is now being done in a large degree by the railroads in providing additional locomotives, cars and facilities under a most burdensome financial situation, which program will no doubt be augmented with an easier money situation?

With the knowledge born of past experience that the volume of transportation business is a series of peak loads and valleys of depression, and that every peak is higher than the preceding one and every valley of a higher elevation than the one before it, and that the constant trend is upward, it

would seem that all interests, those serving the public and those serving the railroads, might with mutual advantage study practical methods of meeting the increased volume of business so sure to come, possibly in a few weeks, certainly before many months.

Regardless of the present car surplus, a decision to:

(1) "Keeping up the habit" of capacity carloading and capacity car mileage during this period of transportation surplus, would be of inestimable advantage when the days of car shortage come again. A habit once formed is not easily gotten away from.

(2) A decision to "Ship Early" would tremendously help the situation and ease off the peak load. There is a great housing shortage, both for business and homes. It is not fair to assume that one of the first upward moves will be in building construction? Clearly, if every activity in this direction were to start May 1, there would be a tremendous load on the railroads and inability to meet this sudden load would be unfortunate and affect the public interest in many directions. Can we not anticipate that this may occur and would it not be wise to commence transporting, and if necessary storing even at the cost of re-handling some of the many materials entering into projects already determined on, in order that there may be no delay due to transportation?

We may definitely assume a large program of highway building and improvement will be started. "Ship Early" would insure an absence of transportation difficulties, such as occurred last winter. In a large part of the United States material can be handled during winter months when there is a surplus of cars as easily as in midsummer, and even where there is severe winter weather a portion of the materials can be transported and handled without great additional expense.

Why not "Ship Early" the thousands of carloads of fertilizer in the winter instead of in the spring when they are required on the farms, and avoid the uncertainties of delays due to an overburdened transportation machine?

Why not "Ship Early" such materials as are required for the maintenance programs of railroads, instead of adding this burden to the heavy load later on?

Might we not profitably have confidence in the future, and having that confidence in this time of depression put the transportation facilities to the utmost possible use in providing against the day of Opportunity?



# Agricultural Engineers Promote Standardization

THE annual meeting of the American Society of Agricultural Engineers which was held December 28, and 30, at the Hotel Sherman, Chicago, had as its outstanding feature a larger measure of usefulness on the part of the society to agriculture, to related industries and to educational work in agricultural engineering. This was true not only of the progress during the year just closed but also in the work under way for the future.

S. H. McCroy, of the Division of Agricultural Engineering, U. S. Department of Agriculture, in the course of a report brought out the need for better means of contact between the work he represents and the departments of agricultural engineering in the various universities with whom and among whom it is obviously desirable to maintain correlation of effort, particularly in research work. Steps were taken toward the formation of a special section of the society consisting of its members directly representing the institutions mentioned to act as a clearing house and coordinating agency. While many of the State university departments as well as the Division of Agricultural Engineering of the U. S. D. A. are well represented in the society provision is made for the admission without restriction of representatives from all state university departments to this section. It is understood that this section will be practically independent of the society as a whole and its functions will be advisory only, its purpose being only to facilitate and make more efficient the combined work of the public agencies already existing.

Much interest attached to the report of the Standards Committee, presented by Raymond Olney, chairman, as it is through this committee that the society carries on its standardization work in connection with the National Implement & Vehicle Association and the American Agricultural Equipment Standards Committee. In addition to a report of work already accomplished and that in progress the report contained recommendations for a better and more comprehensive organization of the committee together with suggestions for minor changes in the constitution of the society to permit better articulation of its work with that of its collaborators in the standardization work.

The society dinner the evening of the 29th had as its feature talks by C. E. Gunnels, treasurer, and J. R. Howard, president, of the American Farm Bureau Federation. Mr. Gunnels spoke briefly on the organization, scope and purpose of the federation, emphasizing its representative character and the fact that it is proceeding along sound economic lines and avoiding political activity or bias. Mr. Howard, after calling attention to the fact that every item

of farm operation or farm improvement involved agricultural engineering in its execution proceeded to set forth the present economic and financial situation in its relation to the farmers of the country and showed how this situation would affect the agricultural engineers, particularly in their commercial connections. He made it very plain that the purchasing power of the farmer's dollar must be materially increased before there can be any great measure of prosperity in the various industries which directly or indirectly are dependent on agriculture.

"Psychological Tests for Technical Efficiency in Agricultural Engineering" was the subject under which F. W. Ives of the Agricultural Engineering Department, Ohio State University, presented the results thus far secured by Dr. H. E. Burt, professor of psychology at the same institution, in the devising and application of psychological tests to determine the probabilities of success of students preparing for agricultural engineering as a profession. It may be stated that the results thus far secured, even though the tests are far from being perfected, are not always conclusive but in most cases are distinctly helpful.

E. V. Collins, Assistant Chief Agricultural Engineer of the Iowa Experiment Station, reported further progress in testing the draft of plows. One interesting development which may be mentioned is the fact that the increase in draft with speed, reported a year ago, applies to all standard types of plows, and that moldboards with a gentle turn, such as breaker bottoms, do not ordinarily have the comparatively light draft with which they are credited. Other important papers included "Land Clearing With Dynamite" by Arthur L. Kline, Hercules Powder Company, Wilmington, Delaware; "Wagon Standards" by E. E. Parsonage, John Deere Wagon Works, Moline, Illinois; "Preservative Treatment of Timbers in Farm Structures" by E. C. Mandenberg of the Barrett Company, Chicago; "Artificial Heating of Animal Shelters" by K. J. T. Ekblaw, engineering editor, "National Farm Power," Chicago, Illinois; and "Tractor Testing" by O. W. Sjogren, head of the Agricultural Engineering Department, University of Nebraska.

In giving the report of the Tractor Committee the chairman, A. H. Gilbert of the Rock Island Plow Company, stated that considerable study had been given to future tractor fuel, with the conclusion that fuel alcohol can be produced on a basis which will prevent fuel famine or prohibitive cost. It appears that a bushel of corn will yield about two and one-half gallons of one hundred per cent alcohol and proportionately more of a less refined product. It is claimed that the feed left as a by-product will



cover the cost of distilling and that the only real obstacle to economical production and distribution of alcohol is the excessive amount of restriction and red tape imposed by the government. Mr. Gilbert predicted that the time would come when the corn fields of Illinois and Iowa would compete with the oil fields of Oklahoma and Texas. The committee also is at work on tractor lug equipment.

Other committee reports calling for special mention include that by R. W. Trullinger, Specialist in Rural Engineering, States Relations Service, U. S. D. A. for the Research and Data Committee, being a discriminating review of real research in agricultural engineering at the various experiment stations and in fact throughout the world. W. C. Kaiser of the Portland Cement Association, chairman of the Committee on Farm Structures presented a report

on the design of the farm elevator, a term used to designate buildings combining the granary and corn crib and designed for the use of modern power elevators in filling the cribs and bins, and also taking into account the sheller drag often used in emptying the cribs. Progress in barn ventilation was reported by W. B. Clarkson, King Ventilating Company, chairman of the committee covering that field. The progress of agricultural engineering in drainage was reported by S. H. McCrory, Division of Agricultural Engineering, and David Weeks, Drainage Engineer, Dakota Engineering Company, Mitchell, South Dakota.

At the closing session F. M. G. Kranich, the president during 1920 called on E. A. White, president-elect to assume the duties of that office.

## Gypsum Plaster as Fire Protection

VIRGIL G. MARANI, Gypsum Ind. Assn.

**I**N this age of building progress more consideration is being given to the use of materials for specific purposes than heretofore. Sane and safe construction together with the nation's increasing need for judicious conservation of materials and labor, are the most important contributory factors to present scientific thought in the selection of such materials as are best suited for pre-determined purposes.

Of the materials necessary for a complete structure, such as are to be exposed to the weather are selected with due consideration to their ability to resist the action of the elements. For interior work, the selection of materials for the floors, casings and trim is based upon considerations involving wear and tear, also the necessary refinishing and repairs due to the depreciation of time and service.

The same reasoning holds good when consideration is given to the best suited substances entering into the construction of plastered walls and ceilings. Upon these interior surfaces the expensive but perishable decorations are applied. The walls have to resist the abuse of furniture that is frequently moved, the wear and tear of occupancy, the removal of old wall paper or decorations and the application of the new. Pictures and the necessary fastenings are dependent on the walls as often as upon the moldings usually provided for hanging. Ceilings are sub-

jected to severe cleaning, repeated decorating and the shocks due to vibrations from floors or the construction above.

Also, the scientific consideration of engineering principles has placed a value upon the physical properties of materials under contemplation which will contribute to the following desired essentials of sane and safe building construction:

### **Fireproof or Incombustible of Metal and Gypsum.**

It is not possible, nor advisable at this time, to urge against the continuance of erecting buildings which are wholly or partly combustible. The rapid development of our cities, the somewhat temporary nature of some structures, the migratory tendencies of many people, the abundant supply and lower cost of lumber, and other self-evident economies are all contributory factors that in the sum total suggest the use of lumber for building purposes, as not only desirable but often advisable.

Since frame (combustible) structures exist, and will continue to be needed for years to come, a service of national importance can be rendered by the adoption of types of construction involving the use of such materials only as, wherever used, will afford some degree of fire protection to the structure as a whole.

It is well known that the yearly fire loss of this



nation averages 250 million dollars. Over 98 per cent of the structures erected are frame construction throughout, or are constructed with outside masonry walls and entirely of frame construction within. In building of this character the fire has to be materially lessened by the elimination of every piece of concealed wood not absolutely needed and the fire protection of the supporting joists, rafters and studs by lath and plaster, using incombustible material for lath, and plastering such with a plaster which is incombustible and also a low conductor. Safer, saner, fire-resisting and more permanent construction can be obtained by the elimination of combustible wood lath. Consistent and adequate fire protection is obtained by the use of incombustible lath and gypsum plaster since these materials being wholly incombustible provide a safeguard against fire by protecting the wood members so covered and making the construction as a whole highly fire-resistive.

#### Fire Protection Obtained By Gypsum Plaster.

Fire tests made upon various types of plastered surfaces, and the evidence of actual fires, are sufficient proof of the fact that a plastered surface offers a positive and definite fire protection dependent upon the quality and thickness of the plaster coating and the nature of lathing materials to which it is applied.

The fire protection afforded by the use of gypsum plaster upon lath is due to the fire-resisting and non-conducting properties of the gypsum together with the incombustible character of the metal lath, its reinforcing function, and its strength.

Technical Paper 155, published by the U. S. Department of the Interior (Bureau of Mines) and edited by Mr. R. W. Stone, states the following with reference to gypsum plasters:

"As gypsum plaster is a poor conductor of heat and cold, it is used as an insulation medium by being poured in plastic form into spaces provided in the construction of cold storage buildings, for fire protection of steel frames of buildings by pouring it into forms surrounding the member to be covered, and for fire-stopping hollow spaces in combustible construction."

Gypsum is the poorest conductor of heat and cold of any fire-proof or incombustible material used in building construction. In report of tests made by the U. S. Bureau of Standards, Pittsburg, in 1917, under the direction of Mr. W. A. Hull, and which involved a "Comparison of Heat Insulating Properties of Materials Used in Fire-Resistive Construction," the following appears with reference to gypsum:

"Gypsum specimens showed long temperature lags at about 105 degrees C., due to dehydration. All gypsum specimens heated through more slowly than clays or concretes. The densest gypsum mixtures

showed slight thermal superiority over the more porous ones, presumably due to greater heat-absorbing capacity."

Also in later tests during 1918-19, by the same authority, entitled "Fire Tests of Concrete Columns," the following is said of gypsum:

#### Protecting Gravel Concrete.

"From theoretical considerations it also seemed probable that if the gravel concrete could have the protection of even a rather thin layer of some additional insulating material, to prevent such rapid heating of the outer concrete as takes place, otherwise, in the standard fire test or in a quick fire, the spalling might be avoided, and the column, protected by both the outer concrete and the additional layer of insulating material, would suffer comparatively little loss of strength. . . . In order to determine the effect of additional insulation on a square gravel concrete column, one of these, No. 27, was plastered with 1 in. of a gypsum plaster, known as wood-fiber plaster. This material contains no sand but has a wood filler. It was selected for this purpose on the assumption that such a material would give better thermal protection than a gypsum plaster containing sand. This plaster was reinforced with light expanded metal of the same grade and applied in the same way as that used on the round columns referred to in the preceding paragraphs." (The specification for expanded metal lath referred to is as follows:) "Thickness, 16-gauge (U. S. Standard)—0.0625 in. Weight per sheet 5 ft. by 8 ft. 8 in., 8 lb. The expanded metal was furred out approximately 1/2 in. from the column so that it occupied a position at about the middle of the thickness of the plaster."

With reference to the fire protection afforded by the use of a covering of 1 in. of gypsum plaster upon metal lath, the report contains the following:

"It will be seen that the ultimate strength of this column (No. 27,) at the end of the four hour fire test, was slightly more than three times the average strength of the two columns of the same kind which had no plaster. In this case, as in the preceding one, a comparison of the temperatures attained in the plastered and the unplastered columns show the important thermal effect of the additional insulation. . . . The lower temperature attained in the center of the plastered column is to be credited largely to the thermal insulation of the plaster."

#### Protection for Wood Construction.

The above references and quotations are submitted as illustrating the unquestionable recognition, by the U. S. Bureau of Standards, of the high thermal insulation and consequent fire protection obtainable by the use of metal lath and gypsum plaster. It is self evident, if the use of a covering one inch thick of gypsum plaster on metal lath protected the reinforced concrete columns under test sufficiently to in-



crease their strength under load and fire to more than three times, metal lath and gypsum plaster must and does protect, very effectively, any wooden or other construction against which it is applied.

For further evidence of the fire-resistive properties of gypsum plaster on metal lath, reference is made to a fire test made at Los Angeles on March 17, 1916, by Robert W. Hunt & Co., Testing Engineers, Los Angeles, Cal.

The panel tested was 15'-2" by 9'-11" high, being plastered on No. 24 gauge diamond mesh expanded metal lath weighing 3.4 pounds to the square yard. The gypsum plaster consisted of a scratch coat composed of one part of gypsum plaster two parts of sand by weight, and a finish coat of equal parts by weight of gypsum plaster and sand. The plaster as applied was found to be of uniform average, minimum of 9-16", a maximum of 3/4". The fire period extended over one hour and fifteen minutes, maintaining an average temperature of about 1,200 degrees Fah. The following is stated with reference to the panel of metal lath and gypsum plaster:

Before commencing test, partitions were carefully examined and following cracks in plaster were found; . . . "There were not any cracks evident in Hardwall (Gypsum plaster, portion of Metal Lath partition."

At the end of the fire period the following is stated:

"Plaster of Hardwall (Gypsum) portion of Metal Lath partition cracked as shown in photograph (but practically none of it detached and in excellent condition otherwise."

**Low Heat Conductivity of Gypsum Plasters**

For equal thickness, gypsum is the lowest conductor of heat and cold of any fire-resisting or incombustible material used in building construction. The question of heat conductivity is of vital importance in the selection of materials used for plastered surfaces. A combustible construction is best protected against the action of fire when it is covered, enclosed, or otherwise shielded by materials that are fire-resistive, and which must also be low heat conductors. Gypsum plasters possess both these essentials,

viz., fire-resistance and low heat conductivity.

Under date of March 28, 1916, Professor G. F. Gedhardt of Armour Institute of Technology, Chicago, after tests submitted the following with reference to gypsum:

"The following results were obtained from thermal conductivity tests of materials of construction submitted by you and designed by you as indicated. The conductivity is expressed in terms of B. T. U. transmitted per hour per square foot of surface per degree Fah. difference in temperature.

Material and Thickness.	Relative Thermal Conductivity
3" solid gypsum . . . . .	0.265
4" hollow gypsum (Partition tile) . . . . .	0.260
4" hollow gypsum (Roof tile not covered) . . . . .	0.200

The conductivity of ordinary window glass has been found by various experiments to be approximately one B. T. U., so that the above results may be interpreted in terms of the conductivity of window glass as unity."

Professor Gedhardt's results show that gypsum possesses lower thermal conductivity than any other fireproof materials of equal thickness used for like purposes.

**Adaptability of Gypsum.**

Attention has been drawn to the fire-proof, incombustible, fire-protection, and low heat conductivity properties of gypsum plaster upon incombustible lath. Fireproof constructions must involve these materials in order to be considered fireproof. Combustible structures become less liable to destruction by fire, and are infinitely better risks, when they contain fire barriers (stop), or fire protection such as is offered by the wise selection of ceiling and wall surfaces which shall consist of incombustible lath plastered with gypsum plaster.

The adaptability of gypsum plastered surfaces is self evident and include: rapid construction resulting in saving of time and labor, no delay of operations due to winter temperatures, sanitary, permanent and durable surfaces which are adapted to color or other decorations without damage from staining or other chemical or physical action.

## Building Demand Accumulates

A PERIOD of depression is largely a state of mind. We had one after the armistice. We are experiencing one now.

For a year or more up to several weeks ago the conduct of business resembled an obstacle race. Then railroad service was demoralized, production was low, labor scarce and inefficient, strikes frequent, materials hard to secure and high in price. It was

difficult to get things done—and everybody wanted to do them.

For the last several weeks business has had a clear way before it. Now rail-road service is much improved, production is good, labor plentiful and more efficient, strikes infrequent, materials easy to secure and lower in price. It is easy to get things done—and apparently nobody wants to do them.



The construction industry illustrates this well. During the war building was held back by war restrictions. The result was a large accumulation of work waiting to be done when the armistice was signed. Yet everybody interested in construction work adopted a waiting attitude until about six months after the armistice. Then everybody who had building work to do tried to do it at once, but there were not enough transportation, labor and materials to go around. Prices soared—and the result was turmoil and disappointment.

Building conditions now are much the same as when the armistice was signed. Because of the interferences just mentioned there is still a large accumulation of work waiting to be done. Yet everybody interested in construction work is adopting a waiting attitude. If continued it may result in turmoil similar to that experienced through the last half of 1919 and nearly all of 1920.

Everybody knows that there is a shortage of dwellings throughout the country and that rents are high. Rents will remain high until there are enough houses to supply the demand. But homes are not the only thing needed. Construction work of other kinds must go ahead, notably highways and railroad improvements.

#### **Plenty of Cement Available.**

All the foregoing explains features of the cement situation not generally known. Some people have feared there will not be enough cement available to supply the needs of a large construction program. This is a mistaken impression based on past difficulties. The trouble in the last year of unusually heavy demand has been not lack of cement manufacturing capacity but inability on the part of manufacturers to keep their plants operating at capacity. The curtailment of cement production was caused by strikes and scarcity of labor at cements plants, strikes in other lines of industry on which the cement plants are dependent, such as strikes in the gypsum plants, the strike of coal miners a year ago, the strike in the Illinois-Indiana coal fields in July, the strike of railroad switchmen which extended through the greater part of this year, and the general lack of transportation facilities, including embargoes on the railroads. The ratio of cement production to manufacturing capacity for the entire year 1919 was only about 54 percent, and thus for in 1920 about 68 percent. The capacity of all cement mills in the United States is 125 million barrels or more annually. The most ever used in the country in any previous year was about 94 million barrels in 1916. That is to say the country has used as much as 75 per cent of its productive capacity, conservatively estimated.

There is now and will be plenty of cement to supply the country's needs as long as transportation and other conditions permit cement mills to operate

reasonably near full capacity and to ship the finished product.

#### **Transportation Still a Problem.**

Many people are too complacent about the railroad situation. Undoubtedly railroad service has improved greatly through increased efficiency in operation, but the roads are not called upon to do what they were called upon to do through last year. Business in general is slowing down and farmers are holding back their products from the market. Business in general is sure sooner or later to revive, and the farmer to send his stored products to market. When both or either of these things occur the railroads will again have more than they are able to do. If everybody wants cement, the farmer turns loose his grain, and business in general quickens, all at the same time, a lot of people are going to be disappointed by delays in their work.

At a time like this when owners, contractors and others may be discouraged from undertaking new projects, the fact should be given prominence that all effort, whether it be the form of money, credits, materials, labor, transportation or what not, that goes into construction work, unlike that going into work of many other kinds, is not consumed. Effort expended throughout the country on many things are consumed might well go into construction work, where the materials and labor and other things involved are not consumed but transformed into house, industrial buildings, improved highways, water-power development and other valuable improvements that form additions to the permanent, taxable wealth of the country as well as tools for production of additional wealth.

If construction work is needed and if such work will add to the permanent wealth of the individual and the country at large, it should be carried on when not subjected to interferences that have been present almost continuously since our entry into the war and which may again be present later.

The time to start construction work is now, says the Universal Portland Cement Co. in viewing the present situation.

#### **Florida Road Department Reorganized.**

A press dispatch from Tallahassee, Fla., Says:

"Announcement has been made by the Governor's secretary, M. L. Dawson, that Governor Hardee today accepted the resignations of four of the members of the state road department.

"The appointment of an entirely new board was announced at the same time, which is as follows:

"J. D. Smith, of Marianna, recently removed by Ex-Governor Catts, was re-instated, thus automatically removing H. V. Maund, of Tallahassee, appointed by the former governor to succeed Mr. Smith. The other new members are: W. W. Clark, of Wall Springs; W. J. Hillman, Live Oak; I. E.



Schilling, Miami; Judge H. B. Phillips, Jacksonville.

"The personnel of the retiring board is: Forrest Lake, Sanford, Chairman; C. A. Tutewiler, Jacksonville; A. J. Johnson, Perry; D. W. Stevenson, Moore Haven; H. V. Maund, Tallahassee."

### New Cement Products Plants.

Nashville, Ark.—P. C. Allen interested in organizing \$1,000,000 company to establish cement plant.

Alton, Ga.—A. H. & K. M. Johnson will rebuild cotton ginnery burned at loss of \$10,000.

Richmond, Va.—Agricultural Supply Corp., capital \$50,000, ineptd. with F. M. Bunch, Prest.; L. B. Enslow, Secy.

Roanoke, Va.—Cementile Products Corp., capital \$50,000, ineptd. with M. M. Caldwell, Prest.; Geo. W. Chaney, Secy.

Roanoke, Va.—Roanoke Cement Tiling & Roofing Co. will probably rebuild portion of plant damaged by storm; loss \$9000.

Wheeling, W. Va.—Concrete Products Co. will erect 2 room addition to plant, contemplated.

Ashland, Ky.—C. R. Wilson, Chicago, Ill., purchased site; contemplates establishing cement-coating nail plant.

Ash Grove, Mo.—Ash Grove Lime & portland Cement Co., Wm. H. Barton, Supt., will improve plant, install rock crushers; contemplate rebuilding machine shop.

Miami, Fla.—Miami Block Co. has been incorporated with capital stock of \$100,000 by Hugh M. Anderson, President; V. J. Riley, Vice-President and R. B. Leonard, Secretary-treasurer.

St. Petersburg, Fla.—Plant to manufacture concrete building material will be established by Petros Mfg. Co., D. G. Zeigler, Mgr.

Birmingham, Ala.—Site of 3 acres with 2 brick buildings has been purchased by American Cement Tile Mfg. Co., T. W. Barnes, Sou. Mgr., 509 Brown-Marx Bldg., Birmingham, Ala.; buildings have been remodeled for manufacture of cement roofing tile; annual capacity 1,000,000 sq. ft.; will erect 60x200-ft. heavy mill construction building with hollow tile walls and red interlocking cement-tile roof; construction by owner; build railroad siding and later in year second one.

Baltimore, Md.—Maryland Concrete Corp., 700 Equitable Bldg., capital \$50,000, ineptd. by Jacob Gouline, Louis Marcus, Eldridge Hood Young.

### Meeting of North Carolina Society of Enginners.

A large enthusiastic meeting of the North Carolina Society of Engineers was held at Raleigh on January 15. Prominent engineers from all over the State were in attendance. Besides the election of officers for the ensuing year, the most important mat-

ter before the meeting was the licensing of engineers and surveyors. A committee from the society, appointed at the annual convention, held last August, had prepared a proposed law and submitted it to the State Legislature, now in session. Various points in the law were discussed, and means devised for assuring the passage of the bill, which has already been favorably acted upon by the Senate Committee on Propositions and Grievances.

Dr. W. C. Riddick was again re-elected president of the society; Mr. R. E. Snowden, highway engineer, Kinston, N. C., vice-president, and Prof. Harry Tucker, secretary-treasurer. The following members of the board of directors were elected: Mr. Chas. E. Waddell, consulting engineer, Ashville, N. C.; Mr. Curtis A. Mees of Mees & Mees, consulting engineer, Charlotte, N. C., and Mr. W. S. Fallis, State highway engineer, Raleigh, N. C.

The North Carolina Society of Engineers in the State Assembly of the American Association of Engineers. The society has been in existence only a few years, and already has a membership of 125.

### Representation Extended Construction Industry.

American participation in the International Chamber of Commerce became fully organized with the appointment of an American committee, composed of fifty-seven of the leading business men of the country.

Members of the committee were appointed by Joseph H. Defrees, president of the Chamber of Commerce of the United States. They were chosen from the main division of the business of the county. A. C. Bedford, chairman of the Board of the Standard Oil Company, of New Jersey, is chairman.

The construction industry is represented by J. H. Burton, president J. H. Burton & Co., New York City, and Franklin Remington, chairman of the Board of Directors of the Foundation Company of New York.

The direct representative of the International Chamber in the United States is the American Section. The section's headquarters at Washington is the point of contact between the membership in this country and the International headquarters in Paris. The American committee will serve in an advisory capacity to the section.

The International Chamber was created at Paris last June. In the form of organization adopted each country holding membership has a national bureau as headquarters of its section its national committee and an administrative commissioner of its own, resident at Paris. The American section headquarters began operation in the fall with Lacy C. Zapf as secretary. The American administrative commissioner, Dr. Fredrick P. Keppel, has taken up his duties at Paris.



## Back Plastered Cement Stucco is Strongest for Exterior Wall Construction

THE following tests on distortion of exterior wall sections are timely and interesting.

Since the United States Bureau of Standards found that the back-plastered metal lath form of stucco construction was the only one on which they could give a 100 per cent rating on frame structures, the Associated Metal Lath Manufacturers have endeavored to educate the building fraternity to an appreciation of this. It has been an up-hill job, and yet this form of stucco is said to have proved time and time again to be more satisfactory and not a little cheaper than drop-siding or masonry.

Chicago, Ill., July 22, 1920.

Associated Metal Lath Manufacturers,  
Edison Building, Chicago, Ill.  
Gentlemen:

We submit herewith our report on distortion tests of wall sections which we have just completed.

The samples tested were designated in your letter of April 27, 1920, and conform in detail to the following descriptions:

1. Back-plastered on metal lath—Back-plaster

on lath furred out by 3/16-inch pencil rods on 2-inch by 4-inch wood studding with 1 1/16-inch Portland cement stucco on outside, back plastered with 1 1/16-inch Gypsum plaster, making 1 3/4-inch from inside surface of back-plaster to outside surface of stucco. On the inside 1 1/4-inch Gypsum plaster; each wood stud toenailed to sill at top and bottom with two 10-penny nails.

2. Siding and Sheathing—Ordinary wood construction, metal lath and Gypsum plaster 1 1/4-inch thick on inside, and sheathing and drop siding 1 3/4-inch thick in outside. Each stud toenailed to sill at top and bottom with two 10-penny nails. Each piece of sheathing nailed to each stud with two 10-penny nails, and each piece of drop siding nailed with one 4-penny nail.

3. Stucco on Metal Lath Over Sheathing—Same as ordinary wood construction except that in place of the drop siding 1 1/16-inch of Portland cement stucco on metal lath was used, furred out with 3/16-inch pencil rods laid on ordinary building paper stretched over the siding.

4. Stucco over 6-inch Hollow Clay Tile—Six-



Effective Uses of Garden Pottery.



inch hollow clay tile covered on outside with 7/8-inch Portland cement stucco and on inside with 7/8-inch Gypsum plaster.

The purpose of these tests was to secure data in regard to the behavior of the different wall sections when under load, and the strength shown by each to resist such loading. Particularly it was desired to observe the behavior of the inside plastered surface to note such cracking, crushing, or falling away of the plaster as might occur under the load. Similar observations were also made on the stucco in the samples using this type of construction.

All the samples used in these tests measured 42-inches by 42-inches outside dimensions. The thicknesses of course varied, depending upon the character of the construction, and were as follows:

Construction—	Thickness (Inches.)
Back-plastered Stucco on Metal Lath....	6 5/16
Siding and Sheathing .....	6 3/4
Stucco on Metal Lath Over Sheathing ....	7 15/16
Stucco Over Six-inch Hollow Clay Tile....	7 3/4

In making these tests the sample was placed in an upright position on the bed of the testing machine, resting on one of its short edges. The load was then applied vertically downward on the diagonally opposite edge. It will be noted that with the sample in this position the studs are not vertical but at an angle of about 45 degrees with the vertical. Thus the studs are not loaded like a long column in compression, but the load is rather a combination of compression, cross bending, and shear. Unless the plastered surface is exceedingly rigid such a stress should produce cracks which would cause the plaster to fall away.

## RESULTS OF TESTS

### Back-Plastered Stucco on Metal Lath.

No effect was noted until the load reached 10,000 pounds, at which cracks appeared in both plaster and stucco near top and bottom corners of the sample. At a load of 14,200 pounds the sample was destroyed by the failure of the interior framework of 2-inch by 4-inch. The metal lath was torn from the studs, due to the failure of the latter, but the greater part of the plaster remained unbroken except for cracking and crushing around the edges.

### Siding and Sheathing.

Plaster slightly crushed at top and bottom corners and a crack produced about 12 inches long near the top corner at a load of 5460 pounds. Sample destroyed by failure of interior framework at a load of 8800 pounds.

### Stucco on Metal Lath Over Sheathing.

Small cracks appeared in both plaster and stucco near top and bottom corners at a load of 9100 pounds. Samples destroyed by failure of interior framework at a load of 10,800 pounds.

### Stucco Over 6-Inch Hollow Clay Tile.

Tile, plaster, and stucco crushed at top and bottom corners, and a crack about 15 inches long produced in plaster just above center of sample at a load of 8000 pounds. Sample crushed so that tiles fell apart at a load of 9600 pounds.

One point of importance to be noted from these tests is the manner in which the plaster held together, even when the supporting framework was completely destroyed. This was noticeable in all the samples tested, and is doubtless due to the monolithic character of the metal lath and plaster construction.

These tests show further that the strength of a wall to resist such load does not depend entirely upon the character of the framework, but is affected to a considerable extent by the nature of the wall surface materials. Note that the only structural difference between sample number 3 and sample number 2 of this report lies in the substitution of Portland cement stucco on metal lath in place of the drop siding. A reference to the above results shows that sample 3 is considerably stronger than sample number 2, thus indicating that stucco on metal lath has greater structural strength than the siding.

Further, the back plastered construction comprising back-plastered stucco having a total thickness of 1 3/4 inches on the outside of the wall and Gypsum plaster 1 1/4 inches thick on the inside, shows greater strength than any of the others, although the interior framework is the same. This increase in strength is due to the monolithic character of the stucco and plaster and to the absence of wood in the wall surface. Wood, such as sheathing or wood lath, tends to crack and split under the load and thus hasten the destruction of the wall. On the other hand stucco or plaster on metal lath acts like as a single piece of material, thus adding to the strength and rigidity of the wall.

Respectfully submitted,

G. F. Gebhardt.

Per J. C. Peebles.

Testing Engineer: J. C. Peebles.

### E. A. White Heads Agricultural Engineers.

The election of E. A. White as president of the American Society of Agricultural Engineers carries incidental interest to the older friends of the society because it has been pointed out that every charter member of the society now living has come to its presidency. Mr. White, or Dr. White as he is known among those who hold worth while the honors arising from scholarship and research, holds a doctor's degree in agricultural engineering from Carnell University. This is believed to be the first and only degree of its kind ever granted in America, and bears



testimony to a high order of engineering skill and research ability.

Mr. White's research work at Cornell was devoted largely to the moldboard plow and resulted in the establishment of a working theory and a mathematical way of expressing in three algebraic terms the shape of any successful moldboard plow. It may be said that Mr. White probably has done more than any other man in America to bring plow design from an art to a science. It was in connection with his plow studies which he kept up after leaving Cornell that he invented the multiple hitch, admittedly the most efficient way of hitching teams of four or more horses in plowing.

It may be remarked that Mr. White was born and raised on a farm in northern Illinois, that he is a graduate of the College of Agriculture, University of Illinois, and that following his post-graduate work at Cornell was in charge of agricultural engineering work at the University of Illinois for seven years. In this capacity he started and carried on up to the time he left the university one of the most comprehensive studies every attempted of the cost of tractor operation together with other important facts such as per cent of time lost in trouble, amount of use annually, etc. Under his administration substantial progress was made by the university in other branches of agricultural engineering, notably farm structures and drainage. To meet conditions arising out of the war and the extensive adoption of tractor power by farmers unfamiliar with it he

organized and carried on a series of tractor short courses of two weeks each which received wide recognition.

Mr. White left the university to become research engineer for the Peoria plant of the Holt Manufacturing Company. He has for a number of years been an authoritative writer on farm machinery and power-farming equipment and methods, and is now technical editor of "Farm Implement News." He has assisted in the supervision of national demonstrations and managed smaller demonstrations, particularly those of motor cultivators.

W. G. Kaiser of the Portland Cement Association, Chicago, Illinois, is first vice-president and E. R. Jones of the University of Wisconsin, Madison, Wisconsin, second-vice-president. Frank P. Hanson, Station A. Ames, Iowa, who has been assistant secretary for a number of months, will be secretary-treasurer. The Executive Council for 1921 consists of I. W. Dickerson, Charles City, Iowa, agricultural editor for a number of farm publications; F. N. G. Kranich, Hyatt Roller Bearing Company, Chicago, Illinois; Raymond Olney, The Power Farming Press, St. Joseph, Michigan; F. A. Wirt, Emerson-Brantingham Company, Harrisburg, Pennsylvania; J. B. Davidson, Iowa State College, Ames, Iowa. The retiring members of the Council are A. J. R. Curtis, Portland Cement Association, Chicago, Illinois, and Daniel Scoates, Texas A. & M. College, College Station, Texas, are succeeded by Messrs. Kranich and Davidson, who come into the Council from the presidency and the secretary-treasurership, respectively.

## Carefully Planned Homes a Rural Necessity

**N**O doubt, the factor contributing most to contentment among our rural population is the well designed farm house like many now being built throughout the country. While much study has always been put on the planning of city homes, only recently has sufficient thought been given to farm house requirements.

These have been incorporated in plans—a prize winner in a recent contest conducted under the auspices of the the Illinois State Board of Agriculture and the Illinois Chapter of the American Institute of Architects.

Perhaps the first thing noticeable about this house, which is especially adaptable to concrete block construction, is its architectural beauty. It is designed as a home, rather than merely as a place in which to live.

The whole house centers about a large living room in which dining accommodations are included.

This provides a room in which the family may assemble, and in which social life may be developed. Next to the living room is the office, readily accessible to the driveway and barns, in which the farmer may keep his accounts and have his library. Opening from one end of the dining room is a spacious porch which may be screened in, providing a cool, airy place where meals may be served during hot weather.

The kitchen—the workshop of the house—is well arranged. Two windows furnish abundance of light, yet are so placed as not to interfere with any cupboards that may be built. A broad sink with two side trays is placed opposite one of the windows. A bench may be built under the sill of the wider window, to be used either as a chair or as a place to set things when the table is full. At the rear of the kitchen is a screened porch which is an excellent place to peel potatoes, shell peas and perform



# Start construction early-Move materials NOW

## Avoid the Construction Difficulties of 1920

**C**<sup>N</sup>AN unprecedented demand for construction materials overhangs the market. Once released, this demand can be met satisfactorily only through cooperation of the various agencies interested.

Owners and public officials must mature plans quickly, so that

**Contractors can order material early  
Dealers can build up stocks  
Manufacturers can ship promptly, and  
Railroads can handle business  
offered quickly.**

Had such a policy prevailed throughout the period since the armistice, the difficulties experienced in carrying on construction work during 1920 would have been considerably lessened, if not entirely avoided. Contracts for an enormous peace-time construction program were awarded too late in 1919 to permit of completion during that year. This deferred demand came upon an unprepared market and was carried over into 1920, only to be still further hampered by the large construction program of that year. Not only was the greater portion of 1919 lost, but the construction industry impeded by railroad congestion was thrown into such turmoil in 1920 that only a cessation of contract letting could clear the situation.

Five years' accumulation of construction still awaits contract letting. If such contracts are awarded early in 1921 and construction proceeds in an orderly, intelligent and efficient manner, material manufacturers and railroads can meet the situation. Unless this plan is followed, difficulties even more serious than those of 1920 can be expected. You share with others a measure of responsibility in preventing a recurrence of such a situation.

Due to handicaps beyond its control, the cement industry operated at only approximately 70 per cent of capacity during 1920. Notwithstanding earnest and sustained effort on the part of cement manufacturers, many users were disappointed due to their inability to get shipments when and where wanted.

Transportation is the neck of the bottle regulating capacity of industry and distribution of its products. Cement is now available everywhere. Manufacturing capacity has always been equal to any calls made upon it unless demand has been concentrated within comparatively short periods.

There's no time like Now to move materials.

## PORTLAND CEMENT ASSOCIATION

Atlanta	Detroit	Los Angeles	Parkersburg	San Francisco
Chicago	Helena	Milwaukee	Pittsburgh	Seattle
Dallas	Indianapolis	Minneapolis	Portland, Oreg.	St. Louis
Denver	Kansas City	New York	Salt Lake City	Vancouver, B. C.
Des Moines				Washington

# Start construction early-Move materials NOW



the other work of the housewife usually cared for outside the kitchen during the summer.

Off the small hall between kitchen and wash-room is a large storage closet with plenty of shelves, while directly opposite is a broom closet where brooms, mops and ironing board may be stored out of sight and where they may be found readily.

A sewing room with a built-in linen cabinet is at the head of the stairs. Two bedrooms with closets are on the second floor. Each has two windows on different sides of the house, permitting cross ventilation. The larger bedroom has the added attraction of a small fireplace. The clothes chute opens from the bathroom and also from the hall, saving many steps. The use and comfort of the screened sleeping porch will be readily appreciated by those who have been obliged to sleep in close, poorly ventilated bed chambers.

As the men come in to their meals, they pass through a large washroom, fitted with lavatory, bench, coat hooks and shelves. A clothes chute off this room allows solid towels to be dropped directly into the basement laundry. The help is thus kept out of the kitchen. The toilet on this floor makes it unnecessary for them to go up stairs.

Such a home built of concrete block or concrete structural tile, will be a permanent, fireproof structure, cool in summer and warm in winter. The variety of surface finish or decorative treatment that can be secured in a concrete block house insures a home that will harmonize well with its surroundings.

**Florida Engineers to Meet.**

The 1921 meeting of the Florida Engineering Society will be held at Lakeland, February 7 and 8, and an interesting program is being prepared. The offi-

cers of the society are: R. D. Martin, president, Tampa; C. S. Hammatt, vice-president, Jacksonville; G. R. Ramsey, vice-president, Orlando; J. R. Benton, secretary, Gainesville; Benjamin Thompson, treasurer, Tampa. The directors are: R. H. Martin, St. Augustine; O. Randolph, West Palm Beach; W. W. Fineren, Jacksonville; C. W. Murray, Miami; H. D. Mendenhall, Lakeland, and R. Y. Patterson, West Palm Beach.

**The Decline in Prices of Construction Materials.**

The wholesale commodity index price of the Bureau of Labor averaged 189 for December, as compared with an average of 100 for the year 1913. The average for metals was 157 and for materials it was 266 for December. Metals have therefore declined 20 per cent and building materials have declined 22 per cent from the "peak" prices of last April. Metals have apparently reached "bed rock", but the average of building is still high.

It is interesting to note that the metals averaged 184 and building materials 164 for December 1918, at a time when the average of all commodities was 206.

The U. S. Steel Corporation should be given credit for having kept steel prices from joining the enormous inflation that occurred in 1919 and 1920, the peak of which was reached in May 1920, when

**WANTED TO BUY**

Wanted second hand Grinding Mills—Griffin Type preferred—also a crusher in good condition. Address Fens, care Concrete Age, Atlanta, Ga.

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**Work, etc.**  
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 Insures strength and beauty. Booklet,  
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 samples, mailed on request.  
**Crown Point Spar Company, Inc.**  
 663-665 Broadway, New York



the average commodity price index was 272. Had all other manufacturers of construction materials followed a similar policy, there would have occurred no such slump in building activity as marked the close of 1920. In May, 1919, the index price of building materials was 164, but a year later it had risen to 341, thus more than doubling; whereas metals rose from 152 to 193 during the same period, or an increase of less than 30 per cent.

The U. S. Steel Corporation was running its plants in December at 90 per cent of their capacity, which speaks for itself as to the wisdom of holding to moderate prices rather than attempting to charge all that the market would stand temporarily.

The index price of building materials was 313

for October and 274 for November, indicating a decline of 13 per cent in one month; but for December it was 266, indicating a decline of 3 per cent. A further marked decline before April is probable.

### STOP Retracing Tracings by Hand

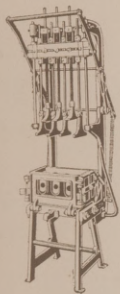
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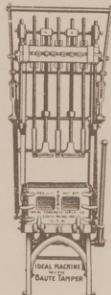
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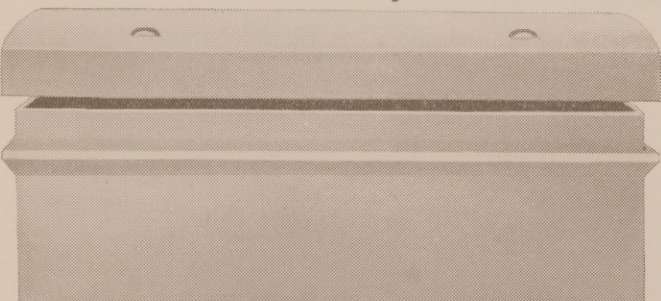
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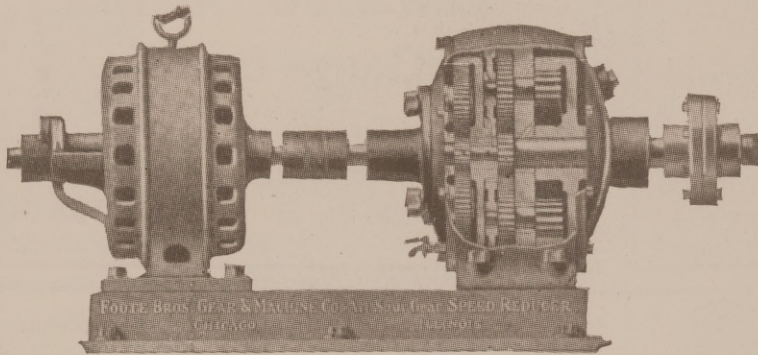
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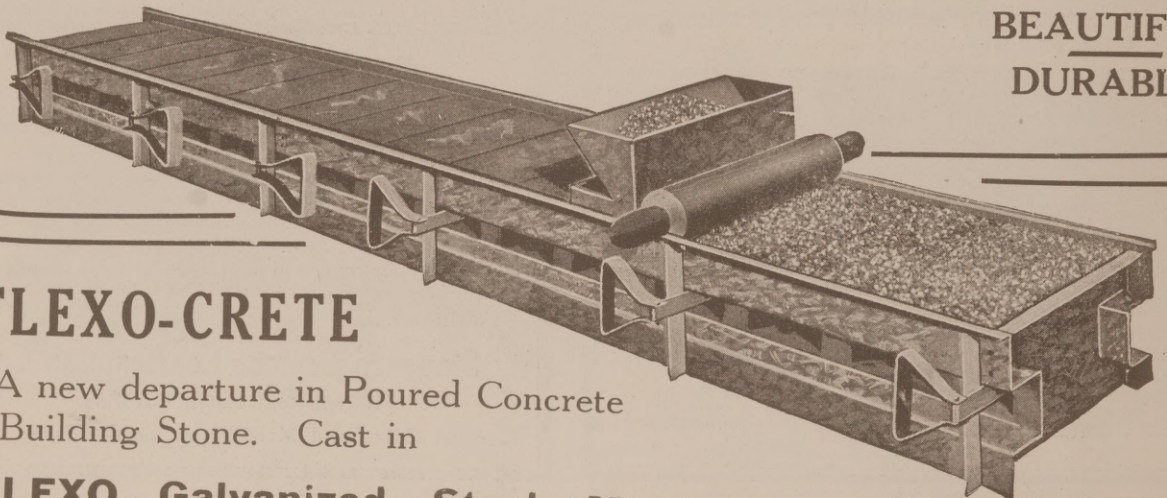
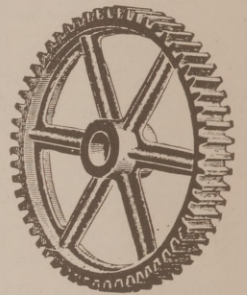
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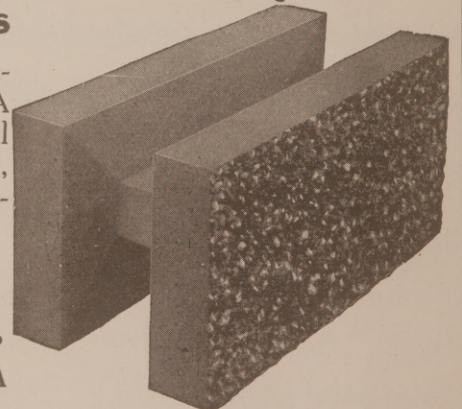
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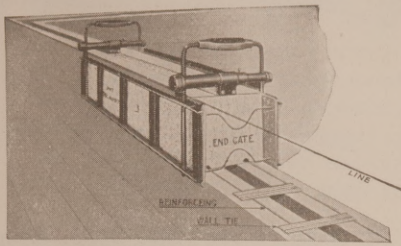
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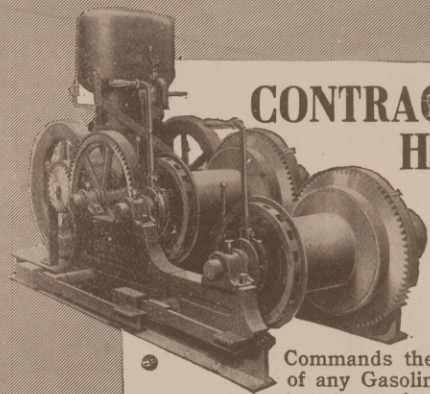
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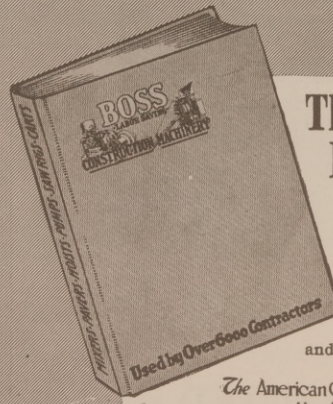
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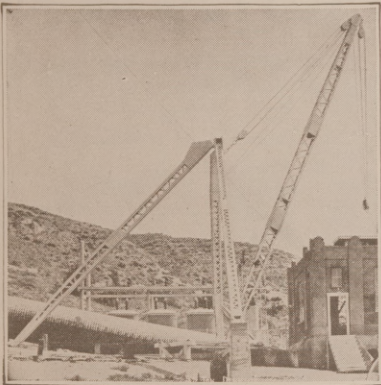
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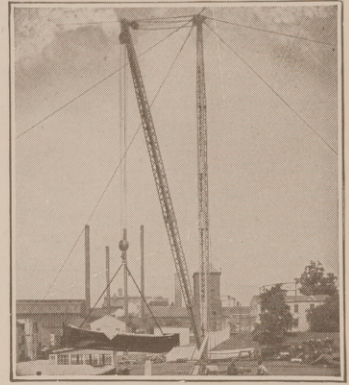
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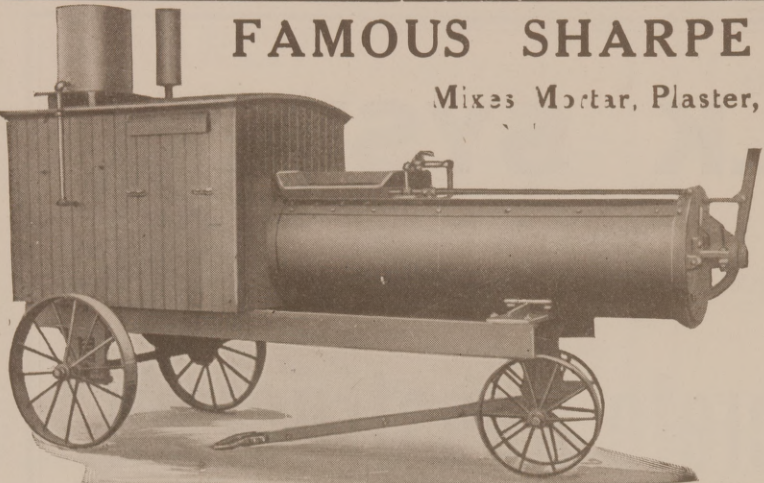
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<p>A. &amp; J. Mfg. Co. .... 6</p> <p>Acme Hollow Wall Co. .... 5</p> <p>American Blue Print Paper Co 27</p> <p>American Cem. Mach. Co. ....31</p> <p>American Steel &amp; Wire Co. ....35</p> <p>Artisan Cement Mold Co. .... 28</p> <p>Automatic Sealing Vault Co. .... 28</p> <p>Art Stone Co. .... 2</p> <p>Austin Company .F. C. .... 4</p> <p>Bates Valve Bag Co. Front Cover</p> <p>Baute Concrete Machinery Co 27</p> <p>Belmont Iron Works ..... 6</p> <p>Brock's Concrete Roofing Tile .....Back Outside Cover</p> <p>Bruner, P. M. ....Back Page</p> <p>Bryan Electric Co. .... 32</p> <p>Burrell Mfg. &amp; Sup. Co. .... 3</p> <p>Calvert Mortar Color Works...33</p> <p>Central of Georgia Railway...35</p> <p>Chesley Co., A. O. .... 6</p> <p>Cincinnati Iron &amp; Steel Co...35</p> <p>Clinchfield Portland Cement Co. 29</p> <p>Commonwealth Motors Co. ....34</p> <p>Cook &amp; Laurie Gravel Co. .... 27</p> <p>Crown Point Spar Co. .... 26</p> <p>Dixie Portland Cement Co. .... 3</p> <p>Eagle Pencil Co. ....27</p> <p>Empire Metal Tank Works .. 27</p>	<p>Flexo Concrete Mould Co. ....30</p> <p>Foote Bros. Gear &amp; Mch. Co. ....30</p> <p>Giant Portland Cement Co. .... 28</p> <p>Griffith, M. J. .... 32</p> <p>Handy Sack Baler Co. .... 3</p> <p>Henry Airtight Weatherstrip Co. 9</p> <p>Hills-McCanna Co. .... 29</p> <p>Hotchkiss Metal Form Co. ....29</p> <p>Kemper Granite Mold Co. .... 9</p> <p>Kirkpatrick Sand &amp; Cement Company ..... 27</p> <p>Kramer Automatic Tamper Co. .... 3</p> <p>Kuhl, H. B. Fred ..... 2</p> <p>LaGrange Specialty Co. .... 32</p> <p>Lombard Iron Works .....29</p>	<p>McAdam Cement Works. .... 4</p> <p>Martin Co., L. ....35</p> <p>Merchants &amp; Evans Co. .... 7</p> <p>National Cement C. .... 26</p> <p>Nat. Plastic Relief Co. .... 6</p> <p>Newman Mfg. Co. ...Back Cover</p> <p>Noblett Mfg. Co. ... Front Cover</p> <p>Ohio Tile Machinery Co. ....31</p> <p>Pioneer Mfg. Co. ....11</p> <p>Pipe Railing Const. Co. Front Cover</p> <p>Polk-Genung-Polk Co. ....33</p> <p>Portland Cement Co. .... 27</p> <p>Portland Cement Products ... 28</p> <p>Pyramid Products Co. Back Cover</p> <p>Ray County Concrete Mfg. Co. .... .....Front Cover</p> <p>Republic Iron Works ..... 32</p> <p>Robertson-Cole Co. .... 33</p> <p>Rowe Mfg. Co. .... 3</p> <p>Sauerman Bros. .... 2</p> <p>Sasgen Derrick Co. ....Back Cover</p> <p>Sealer Distributing Co. .... 9</p> <p>Smith Silo Hardware Co. .... 2</p> <p>Snead Architectural Iron Works .....28</p>
		<p>Southern States Portland Ce- ment Company .....34</p> <p>Standard Cement Const. Co. ....29</p> <p>Standard Port. Cem. Co. .... 4</p> <p>Starks Mfg. Co. .... 5</p> <p>Standard Port. Cem. Co. .....Front Cover</p> <p>Stephenson, C. H. .... 28</p> <p>Schlueter, M. L. .... 4</p> <p>S. P. Stone Co. .... 9</p> <p>Singer Chimney Co. ....33</p> <p>Swedish Venetian Blind Co. .. 28</p> <p>Taylor Lumber Co. ....29</p> <p>Terry Mfg. Co ..... 33</p> <p>Turner, C. A. P. .... 27</p> <p>Universal Road Machinery Co. 32</p> <p>Universal Cement Mold Co. ...31</p> <p>United States Tent &amp; Awning Co. .... 2</p> <p>Vincennes Bridge Co. ....35</p> <p>Walker Adjustable Scaffold Co. .....Back Cover</p> <p>Warren-Knight Co. .... 4</p> <p>Wichita Concrete Machy. Co. ....29</p> <p>Wickes Brothers .....11</p> <p>Williams &amp; Co., C. K. .....Back Outside Cover</p> <p>Willis Mfg. Co. ....35</p>



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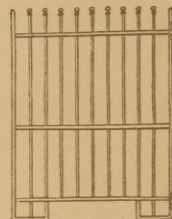
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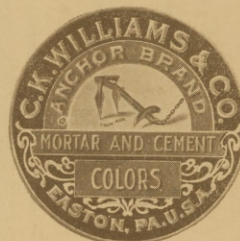
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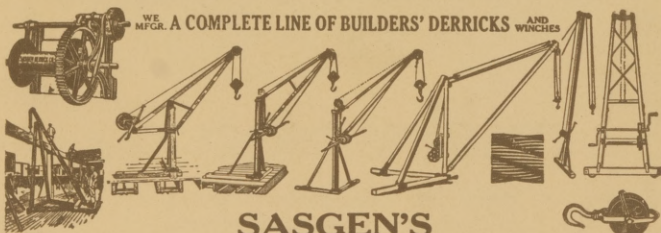
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