

lime may be washed out if the cement is sufficiently porous, more being formed by fresh sea water attacking the lime until the latter is destroyed. It is generally agreed that the better the cement is mixed and placed, with especial view to the density of its surface and impermeability, the less it will be attacked by sea water, more or less regardless of its analysis, the only important consideration of the latter being that its hydraulic index should be high, i.e., percentage of lime low.

NEW BOOKS, ETC.

A HANDBOOK OF SMALL TOOLS. By Erik Oberg. New York: John Wiley & Sons, 1909. 517 large 12mo. pp.; 282 illustrations; cloth. Price, \$3.

In the present multiplication of books on all sorts of subjects it is comparatively rarely that one comes across a new publication the subject of which has not already been treated, less comprehensively or less thoroughly or simply earlier, but the present work seems to fill not a "long-felt want" so much as a recently arisen and hitherto unfilled want. The rapid development of highly automatic machine tools and the use of high speeds facilitated by improvements in steel have developed entirely new requirements in the way of tools and the author endeavors to provide instructions in the best modern practice for the benefit of the toolmaker, draftsman, foreman, and shop superintendent. The book is practical and to the point, simple in language, and well suited to the class for which it is particularly intended. The new developments above referred to require more instruction in what tools to make than in how to do it, the latter being generally easily thought out by a good workman, and the author therefore gives his attention primarily to the former. The book is full of useful tables and data for tool making and for those interested the formulae by which those data are calculated and other simple mathematics are given. The authenticity and originality of the work is sufficiently demonstrated by the fact that it represents the practice of one of the largest and most advanced tool-making firms in the country with which the author was associated for several years.

HOW IT IS DONE: OR, VICTORIES OF THE ENGINEER. By Archibald Williams. New York: Thomas Nelson & Sons, 1908. 12mo.; cloth; pp. 484; 268 ill. Price, \$1.25.

In this book the author has described in simple language how the great engineering feats of the world have been accomplished. Among the subjects treated are railroad engineering, the building of a big ship, bridge building (including an account of suspension and cantilever bridges and detailed descriptions of the Forth Bridge, Blackwell's Island Bridge, and the collapse of the Quebec Bridge), the building of the new Croton Dam, curbing the Nile, notable reservoirs, Panama Canal, harbor works, tunnels and tunneling, mining and mines, power from falling water.

Legal Notices

60 YEARS' EXPERIENCE

TRADE MARKS
DESIGNS
COPYRIGHTS &c.

Anyone sending a sketch and description may quickly ascertain our opinion free whether an invention is probably patentable. Communications strictly confidential. HANDBOOK on Patents sent free. Oldest agency for securing patents.

Patents taken through Munn & Co. receive special notice, without charge, in the

Scientific American.

A handsomely illustrated weekly. Largest circulation of any scientific journal. Terms, \$3 a year; four months, \$1. Sold by all newsdealers.

MUNN & CO. 361 Broadway, New York

Branch Office, 625 F St., Washington, D.C.

INDEX OF INVENTIONS

For which Letters Patent of the United States were Issued for the Week Ending March 9, 1909,

AND EACH BEARING THAT DATE

[See note at end of list about copies of these patents.]

Abdomen compress, T. P. Taylor... 915,049, 915,051
Abdomen compress attachment for corsets, T. P. Taylor... 915,050
Acid, mercury salt of para-aminophenyl-aromatic, W. Gruttelein... 914,408
Addressing machine, Walrod & May... 914,999
Advertising device, Guerrant & Sydnor... 914,656
Aeroplane, H. Mueller... 914,969
Air brake automatic coupling, G. Rijma... 914,512
Air moistener, C. G. McKendrick... 914,862
Airship, J. T. Rice... 914,511
Airship, aeroplane, L. A. Becht... 914,782
Alpha-halogen-isovaleryl-urea and making the same, E. Saam... 914,518
Alumino silicate or artificial zeolite, R. Gans... 914,405
Amusement apparatus, P. J. Sagehomme... 914,884
Amusement device, J. Huebner... 914,723
Amusement steps, J. H. Cross... 914,865
Animal serum, obtaining, R. H. Deutschmann... 914,644
Animal trap, A. N. Atkins... 914,912

Animal trap, W. M. Kaiser... 915,028
Automatic fountain, A. G. Ionides... 914,419
Automobile air cushion, J. B. Taylor, Jr... 914,896
Awning, M. M. Conroy... 914,639
Ax, brush, F. Hammerly... 914,947
Band cleaner, space, W. H. Schuyler... 914,522
Band resaw and double jointer, J. McWilliams... 914,746
Banjo hand support, D. E. Hartnett... 914,660
Bar, See Railway rail tie bar.
Barrel or keg and head therefor, wooden, J. W. Brainard... 914,787
Beam, walking, H. Shannon... 914,308
Bearing, F. W. Salmon... 914,520
Bed bottom fabric, F. W. Kinney... 914,958
Bed clamp, A. T. Sawyer, reissue... 912,926
Bed settee, J. Phillips... 914,671
Bedstead crib attachment, V. O. Crawford... 914,641
Belt coupling, J. Brenner... 914,634
Belt stretcher, A. C. Donell... 914,815
Binder, loose leaf, C. L. Baldauf... 914,781
Binder or loose sheet holder, temporary, H. F. Busbong... 914,383
Binder, temporary, C. A. Hartmann... 914,953
Blacking box, C. E. Conder... 914,638
Blade holder, Dubring & Wobensmith... 914,707
Blanket clamp, D. E. Coe... 914,637
Block mounting, swivel, J. Ward... 914,683
Block signaling system, H. M. Coulter... 914,386
Bobbin, J. R. Coe... 914,793
Bobbin holder, T. J. Murdock... 914,742
Boiler and furnace, combined, W. J. Ellis... 914,647
Boiler due cleaner, J. J. Flynn... 914,940
Boiler furnace, J. C. Parker... 914,749
Boilers, etc., protective covering for blow-off pipes of steam, J. Beattie... 914,592
Bolt clipper, J. A. Alley... 914,910
Book, E. Davis... 914,764
Boot and shoe exhibiting device, E. Lange-nohl... 914,431
Boot and shoe internal cushion, J. Ramsay... 914,674
Boot and shoe upper and box toe therefor, H. C. Jenney... 914,724
Boot or shoe form, J. S. Hansen... 914,400
Boring appliance, A. J. Signor... 914,759
Bottle labeling machine, N. Muslar... 915,035
Bottle, non-refillable, C. S. Thomas... 914,529
Bottle, non-refillable, Schmidt & Shanahan... 914,885
Bottles, cans, etc., powder distributor and closure for, C. H. Van Rensselaer... 914,766
Box fastener, R. Schleicher... 915,045
Box lid holder and box opener, Bergquam & Bjork... 914,919
Box making machine, W. M. Gentle... 914,820
Bracelet, expandible, W. S. Thornton... 914,533
Bracket, H. Zimmerman... 914,774
Bracket, Potter & Louis... 914,974
Bracket support, A. G. Crago... 914,387
Brake beam, R. H. Thompson... 914,530
Braking device, V. Lamb... 915,031
Bread cabinet and cutting knife, combined, P. Nelson... 914,866
Broom holder, I. E. Sucher... 914,980
Brush cutter, P. P. Dick... 914,392
Brush, fountain shaving, L. D. Stevens... 914,526
Brush, sieve cleaner, J. R. Wiens... 914,687
Brush, stencil, Nickerson & Hughes... 914,970
Brush, tooth, D. McEachern... 914,501
Bucket, dumping, H. J. Russell... 914,753
Bucksaw, F. L. Hammer... 914,833
Bullet, L. B. Taylor... 914,992
Bullseye vault forming mold, A. O. Hunsaker... 914,417
Burnishing machine, M. Godlewski... 914,943
Cake press, E. Erickson... 914,711
Calculating machine, C. A. Meilicke... 914,439
Calculator, A. G. Meier... 914,741
Calf muzzles, P. C. Roberts... 914,881
Caloric engine, C. L. Fortier... 914,562
Camera, photographic, L. Borsum... 914,784
Can beading machine, J. Brakeley... 914,695
Can opener, A. O. Hanson... 914,829
Candlestick, R. F. Crooke... 914,804
Car, etc., burglar alarm, railway, G. Potter, Jr... 914,508
Car axle box, railway, J. B. Arrington... 915,011
Car berth wall pocket, sleeping, S. W. Clark... 914,701
Car, convertible amusement and dining, C. H. Packard... 914,748
Car coupling, Szmutek & Stevenson... 914,895
Car door, grain, D. W. Thomas... 914,994
Car draft gear, N. H. Surdenik... 914,990
Car draft gear, railway, W. R. Matthews... 914,665
Car drop door structure, F. W. Bradley... 914,786
Car, dumping, W. J. Chance... 914,925
Car end construction, Julien & Point... 914,726
Car, passenger, E. T. Robinson... 914,751
Car stop, automatic, J. J. Fleming... 914,938
Car ventilator, S. C. Carroll... 914,924
Carpet sweeper, F. C. Mason... 914,438
Carriage thill, Cooley & Marks... 914,553
Carrier, W. Seegers... 914,907
Carving machine, F. H. Richards... 914,676
Castings, means for forming threaded openings in, J. Bedell... 914,915
Check controlled apparatus, C. F. Morris... 914,596
Churn, F. E. Stagg... 914,986
Cigar cutter and lighter, W. J. Crowley... 914,928
Circuit closer, rotary, F. E. Lind... 914,435
Circuit controller operating mechanism, N. W. Truxal... 914,535
Cistern automatic cut-off, R. E. Estes... 914,936
Clay working machine, F. B. Lambert... 914,735
Clock combined with coin freed winding up apparatus, A. G. P. Wiinggaard... 914,907
Clothes pin, J. B. Anderson... 914,691
Clutch, electromagnetic, H. Ast... 914,375
Clutch operating mechanism, H. L. Turney... 914,536
Coal drill, J. S. Surbaugh... 914,893
Coal or rock drill, Mayer & Ashton... 914,966
Coal tipple, E. B. Bull... 914,698
Cock, gas, C. H. Wiley... 915,005
Coconut grater, M. E. Hunt... 915,055
Coin delivery machine, S. Randell... 914,510
Collisions at sea, device for preventing, G. Fischer... 914,483
Column, girder, etc., J. W. Muldoon... 914,861
Comb, G. W. Shadie... 914,979
Comb, hair, Speck & Henschel... 914,984
Computing machine, Uebeling & Marshall... 914,467
Concrete block, H. N. Pettigrew... 914,507
Concrete frame for door and window openings, J. H. & D. H. Magdil... 914,590
Condenser support, steam, L. R. Alberger... 914,778
Conduit receptacle, J. S. Stewart... 914,762
Container, single opening safety, W. Ashbury... 914,779
Conveyer apparatus, H. B. & J. A. Sauer... 914,755
Conveyer roller ball bearing, S. L. Goldman... 914,714
Cooking or heating utensil, E. W. Hamberger... 914,828
Corn planter, automatic, F. N. Adams... 914,373
Corset, apparel, D. Kops... 914,732
Corset lacing device, M. B. Gardner... 914,406
Corsets, means for pinning down waists to, S. Kons... 914,733
Cotton chopper, Winkler & Thoene... 915,009
Cotton chopper and cultivator, A. M. & J. W. Thompson... 914,617
Cotton seed separator, J. T. Cox... 914,800
Cream separator liner, centrifugal, Hackett & Morgan... 914,488
Cream separators, cream exit for centrifugal, C. H. Hackett... 914,487
Creepier, J. Auer... 914,780
Cross tie, S. Michaels... 914,967
Cultivator, E. Haiman... 914,568
Cultivator, A. Bridgen... 914,788
Cultivator, disk, Buckaeck & Huliclus... 914,921
Cultivator, garden, J. T. Anderson... 914,911
Culvert, corrugated metallic, H. Mallory... 914,963
Curling iron, electrically heated, B. Y. Snyder... 914,888
Current indicating apparatus, J. S. J. Lallie... 914,959
Current motor, E. Imboden... 914,574
Curtain pole, J. B. Phinney... 914,876
Curtain supporter, L. Nachmann... 914,865
Cuspidor, flush, J. W. Cooper... 914,927
Cutting, piercing, and marking pen machine, W. J. Naphey... 914,600
Cycle, C. S. Johnston... 914,492
Dam, W. G. Fargo... 914,559
Dam, crest, automatically movable, H. Buchler... 914,789
Delivery mechanism, A. J. Ford... 914,561
Deodorizing and disinfecting device, Walter & Imman... 915,000
Derrick pile driver, G. T. Fivayth... 914,403
Dethatching, von Kugelgen & Seward... 915,029
Die stock, adjustable, I. W. Nonneman... 914,503
Dipping machine, W. B. Crocker... 914,803
Disinfecting apparatus, V. A. Williams... 914,544

Scientific American



Economical Production

and shop equipment that is unequalled in facilities and management, enable us to market our

"Star" Lathes

for belt or foot power at most moderate prices, while the quality, efficiency and durability leave nothing to be desired. Write and ask us for catalogue "B." It is interesting.

THE SENECA FALLS MFG. CO.
63 Water St., Seneca Falls, N.Y.

Engine and Foot Lathes

MACHINE SHOP OUTFITS, TOOLS AND SUPPLIES. BEST MATERIALS. BEST WORKMANSHIP. CATALOGUE FREE

SEBASTIAN LATHE CO. 120 Culvert St., Cincinnati, O.

Foot and Power and Turret Lathes, Planers, Shapers, and Drill Presses.

SHEPARD LATHE CO. 133 W. 2d St., Cincinnati, O.

THE "BARNES" Upright Drills

10 to 50-inch Swing

Send for Drill Catalogue.

W. F. & JNO. BARNES CO.
(Established 1872)



1999 Ruby St., Rockford, Ill.

"Bougie Eyquem"

The FRENCH SPARK PLUG that Protects Your Coil and Magneto

A plug that surpasses anything on the market. Price \$2.50 each. Circular on request.

MONTGOMERY & CO.

105 Fulton Street, New York City

Pipe Cutting and Threading Machine

For Either Hand or Power

This machine is the regular hand machine supplied with a power base, plow, countershaft, etc., and can be worked as an ordinary power machine or taken from its base for use as a hand machine. Pipe 1/4 in. to 15 in. diameter handled easily in small room. Illustrated catalogue—price list free on application.

THE CURTIS & CURTIS CO.

6 Garden St., Bridgeport, Conn.

Safety Razors FREE

To quickly introduce the celebrated Ideal Shaving and Complexion Soap which benefits, removes pimples, blotches and all facial eruptions, leaving skin soft & clear & to prove what we claim is true, we will send a box of soap together with the latest news and Safety Razor outfit in a fine handsome case all complete for shaving. ABSOLUTELY FREE to any one answering this advertisement at once & enclose 10cts. silver or stamp to help pay boxing, packing, mailing, etc. Address.

THE AM. SOAP WORKS, Dept. S.A. 95 Chambers St., N.Y. City.

How to Construct An Independent Interrupter

In SCIENTIFIC AMERICAN SUPPLEMENT, 1615. A. Frederick Collins describes fully and clearly with the help of good drawings how an independent multiple interrupter may be constructed for a large induction coil.

This article should be read in connection with Mr. Collins' article in SCIENTIFIC AMERICAN SUPPLEMENT, 1605, "How to Construct a 100-Mile Wireless Telegraph Outfit."

Each Supplement costs 10 cents; 20 cents for the two. Order from your newsdealer or from

MUNN & CO., 361 Broadway, New York



The ONLY Correspondence School formulated on practical engineering lines for giving instruction in

Modern Cost Systems; Factory and Commercial Office Systems; Manufacturing Methods and Systems; Shop Organization and Management; Shop Construction and Equipment; PatternShop and Foundry Systems; Mechanical Drawing; Mechanical Engineering, etc.

By a Mechanical Engineer who is an acknowledged authority on the subject

Every instructor is a practical man.

Every student is considered individually and instruction planned to fit him and his work.

Every man is thus able to qualify for a higher position and a better salary.

Modern Systems Correspondence School

Executive Offices, 6 Beacon St., Boston

OSCAR E. PERRIGO, M. E., Educational Director

(Consulting Mechanical Engineer)