sharpest blades are very quickly dulled in cutting cork? A. The elastic nature of cork makes it necessary to draw cut in cutting cork, which is not usual in cutting wood. The draw cut tends to dull the edge of sharp cutting tools very quickly when cutting any kind of material.

NEW BOOKS ETC.

GAS AND OIL ENGINE MANAGEMENT. BY M. Powis Bale, M. I. Mech. E., A. M.I.C.E. New York: J. B. Lippincott Company. 1903. Pp. 110. Price \$1.50.

The author of this handbook has previously published two similar books for steam engine users, which have been very successful; and, what counts for more, he has had fifteen years experience with gas engines. The handbook gives a good many practical points regarding the care and operation of stationary gas and oil engines, and it also contains useful tables giving the calorific value of the various fuels ordinarily employed.

L'Industria Frigorifera. By Pasquale Ulivi. Milan: Ulrico Hoepli. 1904. 18mo. Pp. 168. Illustrated. Price 40 cents.

This small volume describes in detail the various methods use $oldsymbol{e}$ in producing cold and artificial ice for refrigerating purposes. The liquefaction of air and various gases is also treated quite thoroughly, and the different processes are described. The book also contains sixteen tables of value bearing on the subject treated.

Y LESSONS IN ARCHITECTURE. By Thomas Mitchell. New York: The EASY LESSONS Industrial Publication Company. 1904. 12mo. Pp. 92. Numerous illustrations. Price 50 cents.

This little volume is intended to give rudimentary instruction in architecture to all interested in studying that most fascinating art Each chapter consists of a number of questions and answers on some particular style or branch of architecture from the earliest times down to the present. The arrangement of the text in classified questions and answers puts it in very concise form, and makes the contents of the book easy to grasp and to remember. The present, or second, edition has been especially arranged for American readers. It will be found most useful to all who wish to know something of the main principles of architecture.

MARY OF MAGDALA. An Historical and Romantic Drama in Five Acts. The Original in German Prose by Paul Heyse. The Translation freely adapted and written in English Verse by William Winter. New York: The Macmillan Company. 1903.

We shall not quarrel with Mr. Winter for having done Heyse's religious drama into English blank verse. His rendering undoubtedly gains in dignity thereby. But we do seriously object to his having presented us with an expurgated version, when no expurgation was necessary. Winter's Mary is not Heyse's Mary. The German dramatist painted a strong picture of a woman exultantly sinful at first, bitterly penitent at the last. The American translator robs her of every trait of wickedness, and allows her to weep through four acts, with nothing to weep for. Confessedly ig-norant of any knowledge of German, Mr. Winter presumptuously proclaims Heyse's text devoid of poetical or spiritual merit. Those who are blessed with a more intimate acquaintance are blessed with a more intimate acquaintance with Heyse's splendid prose than is Mr. Winter, and who have not based their views on a "rough, literal translation," will find the or-"rough, literal translation," will find the original a more virile play, with stronger dra-matic contrasts, than Mr. Winter would have us believe.

PUBLICATIONS OF THE MISSISSIPPI HISTORI-CAL SOCIETY. Edited by Franklin L. Riley, Secretary. Vol. VII. Oxford, Miss.: The Mississippi Historical So-Miss.: The Mississippi Historical Society. 1903. 8vo. Pp. 531.

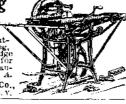
The present volume is composed of a number of papers dealing with different phases of State history, and will certainly prove of interest to the historian and to residents of the State of Mississippi. There is an excellent chapter on the Mississippi fixeds by **Dr**. John W. Monette, and another chapter is on "The Progress of Navigation and Commerce on the Waters of the Mississippi River and the Great

LUFTVERUNREINIGUNG UND VENTILATION. Mit besonderer Rücksicht auf Industrie und Gewerbe. Von Dr. Josef Rambousek. With 48 illustrations and a table. Vienna and Leipzig: A. Hartleben. 1904. 8vo. Pp. 260.

The author starts out with an elementary discussion of ventilation principles, presenting a theory of ventilation and something of the technology of ventilation. In this particular part of the work the chief sources of impurity discussed are the exhalations of the human body. For this reason the earlier divisions of the book are confined to a discussion of the ventilation of dwellings, schools, churches, theatres, and the like. The second division, on the other hand, is devoted to a treatment of the ventilation of industrial buildings, such as factories impregnated with gases and dust. It is here that the author has given striking evidence of original investigation, for which reason these chapters constitute the most valuable portion of this treatise.

Wood-working Machinery

For ripning, cross-cut-ting, mitering, grooving, toring, scoll-sawing, edge moulding, mortising; for working wood in any man-ner. Send for catalogue A. The Seneca Falls M'f'g Co.,





Foot and Power and Turret Lathes, Plan-SHEPARD LATHE CO., 133 W. 2d St., Cincinnati, O.

Heavy Overloads are Carried Safely when belts are made of the right stuff and in the right way.



SCHIEREN BELTING is made of the best hides, tanned by the best oak-bark methods, and joined by our longitudinal Isp cerstruction. You can't put better belting on your pulleys, our Dirie Belt Leather Book explains every step of the making.

CHAS. A. SCHIEREN & CO. CHAS. A. SCHIERLEN & CU.
NEW YORK: 59 Ferry St.
CHICAGO: 99 Franklin St.
PHISPURS: 199 Lincoln St.
PHISPURS: 243 Third Av.
PHILADELPHIA: 228 A. Third St.
BENVER: 1519 Sixteenth St.
HAMBURG: Pickhuben 4.

GIANT STEAM SHOVELS The Vulcan Iron Works Co.

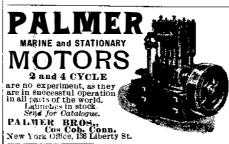
THE NICKEL PLATE ROAD AGAIN SELL-ING LOW RATE COLONIST TICKETS TO THE PACIFIC COAST.

Tickets on sale every day, March 1 to April 30, at rate of \$42.50. These tickets are good in our trans-continental tourist sleepers and via any route desired beyond Chicago. For full particulars see local agents, or write R. E. Payne, General Agent. 291 Main Street Buffalo, N. Y., or A. W. Ecclestone, D. P. A., 385 Broadway, New York.

ROOFING











DIE PRAXIS UND BETRIEBSKONTROLLE DER SCHWEFELSAEURE-FABRIKATION. Fuer den Chemiker, Meister, Kammerfuehrer, etc. Von Dr. S. Meirzinski. With 19 illustrations. Vienna and Leipzig: A. Hartleben. 1904. 16mo. Pp. 256. Price \$1.50.

This work may be considered a practical ext-book on the manufacture of sulphuric acid. Under the heading "Chemical Control of Manufacture" only such processes are discussed which are actually in use in laboratories. These processes are so thereughly and clearly described that even the unpracticed chemist may follow the steps described.

EVAPORATING, CONDENSING, AND COOLING APPARATUS. By E. Hausbrand. Trans-lated by A. C. Wright, M.A., B.Sc. London: Scott, Greenwood & Co. New York: D. Van Nostrand Com-pany. 1903. 8vo. Pp. 400. Price

It would be difficult to find a subject where the literature is as inadequate as that relating to evaporating and condensing apparatus, and the author has done a signal service to mechanical engineering in the production of the present book, which is an excellent one. That this book was needed is shown by the fact that the first German edition was exhausted in a very short time. The whole treatment of the subject is most scholarly. We regret that lack of space prevents our publishing at least an abstract of contents.

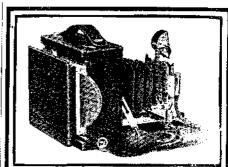
INDEX OF INVENTIONS

For which Letters Patent of the United States were Issued for the Week Ending March 29, 1904.

AND EACH BEARING THAT DATE

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

way, New York. Warren's Natural Asphalt Sand Surfaced ROPLY IT YOURSELF APPLY IT YOURSELF Comes ready to lay in rolls of 108 square feet. Wirte for sample, circular and prices. Wirte for sample circular and prices. All lunds of Automobile Castings. FONTIER IRON WORKS, 2 Auburn Ave., Buffalo. N. Y FRONTIER IRON WORKS, 2 Auburn Ave.,	755,705 755,963 756,169 756,065 1 755,629 755,629 755,628 755,628 755,628
APPLY IT YOURSELF MAKES A FINISHED GRAVEL ROOF. Comes ready to lay in rolls of 108 square feet. Write for sample circular and prices. Will be compared to the compared to	755,963 756,169 756,065 755,801 755,629 756,161 755,834 756,081
APPLY IT YOURSELF MAKES A FINISHED GRAVEL ROOF. Comes ready to lay in rolls of 108 square feet. Write for sample. circular and prices. Marco Chorical & Marco 18 Petton Pl. New York	756,065 . 755,801 . 755,629 . 756,161 . 755,834 . 756,081 . 755,628
MAKES A FINISHED GRAVEL ROOF. Comes ready to lay in rolls of 188 square feet. Write for sample. circular and prices. Minish of 18 Reptay Pl. New York Awl, pocket sewing, J. L. Davison	755,801 755,629 756,161 755,834 756,081 755,628
Comes ready to lay in rolls of 108 square feet. Write for sample. circular and prices. Where Charles & Mir Co. 18 Petters Pl. New York. Awil, pocket sewing, J. L. Davidson	. 755,629 . 756,161 . 755,834 . 756,081 . 755,628
and prices. Awd, pocket sewing, J. L. Davidson	. 755,628
William Chamical & Mfr. Co. 18 Pattony Pl. New York. Av. 1 E. Letthous, J. L. Davidson	755,628
Axle box fastener, car, F. G. Koehler HIGHEST GRADE GREY IRON CASTINGS Axle Intricator, C. J. Stene	755,886
HIGHEST GRADE GREY IRON CASTINGS Base halfear on made and street and automated	. 100,001
For Gasoline Engines and Cylinders combination. W. A. O'Kane	755 BQ2
All kinds of Automobile Castings. Baling press, continuous, D. H. Linthicum	755,896 755,661
FRONTIER IRON WORKS, 2 Auburn Ave., Buffalo. N. Y Band cutter and feeder, C. H. Hill Bandage, suspensory, E. R. Drake Bandage, suspensory and property and prop	756,005
Angle Barrel soaking apparatus, B. Danner Bath tub, H. P. Coile Bath tub, electric, J. Zwiebel Battyries, current selector for charging sec	755,747 755,830
Benders Batteries, current selector for charging secondary M. B. Hutchison	755 669
We make hand-power benders for forming angles in stock in. thick and under. Light stock can be bent cold. We make hand-power benders for storage, A. Meygret Bearing, spacer, bell, A. P. Smith, Jr Bearing, spacer, bell, A. P. Smith, Jr Bearing, vertical shaft, E. M. Sagger	756 173
gles in stock in thick Bearing, roller, R. F. Bower	755,992 756,069
can be bent cold. Bearing, vertical shaft, E. M. Sanger 755.703	755,704
910 Rays I neuvence Ruilding. CHICAGO Bed attachment, E. E. Robertson	755,699 755,987 i
Bed, folding or calchet, H. Faschian Beerword distributer, R. Mally Bell, W. W. Dean	756,162 755,901
PALMER Bell, W. W. Dean	755,630 755,811
Belt shifter, E. Kuthe	755,678
MARINE and STATIONARY Belt shifter, H. J. Hoegh Bench. See Washbench. Binder, J. O. Deckert	756,159
MOTORS Binder, J. O. Deckert	756,106 755,762
MOTORS 2 and 4 CYCLE are no experiment, as they are in the experiment, as they Binder, J. O. Deckert	755,627
in all successful operation in	190,000
Lahmehes in stock. Send for Catalogue. Boiler glass water gage, steam, G. S. Neeley	- 1
Send for Catalogue. PALMER BROS. Cos Coh. Conn. New York Office, 136 Liberty St. Send for Catalogue. Neeley Neeley Boiler headers, forming, J. P. Sneddon. Boiler water column, steam, G. H. Holland Book and copy holder, stenographer's note,	755,718 755,875
E. Sexton.	756,147
Book marker and leaf holder, combined, C. L. Hrauda	756 115 l
Bottle closure, K. H. Cressman	755,623 755,619
Brake, F. Stoltzenburg	756 (109 F
Braking system, C. P. Steinmetz. Brazing cast iron, J. E. Tichon. Brazing compound, J. E. Tichon. Brick making machine, J. H. Venables. Bridge, J. Tomlinson. Brush, S. Zacsek. Brush, S. Zacsek.	756,079
Brick making machine, J. H. Venables	755,818
Brush, S. Zacsek.	755,985
Four-Cylinder. Model "L" 1904 Actual 22 horsepower, with only 85 lbs. loaded weight to each horse power. Speed range of 4 to 40 miles per hour. Anti-friction ball bearing axles, direct drive, mechanical valence for intake and exhaust. Winner axles, direct drive, mechanical valence for intake and exhaust. Winner and used to the combined of the com	756,103
Actual 22 horsepower, with only 85 lbs. loaded weight to each horse- power. Speed range of 4 to 40 miles per hour. Anti-friction ball bearing Runker, bin. etc. W. D. Nanier.	755,633 756 138
\$3,000. Send for illustrated descriptive literature and name of nearest agent. Lynch Butter and making same, milk product resembling, J. H. Campbell	755.843
Button attaching machine, H. Kerngood	755.884
Member Association of Licensed Automobile Vanufacturers. New York Agents:—Packard Motor Car Co., or N. Y., 317-319 W. Cabinet. N. A. McDonald	756, 02 7 755,688
Calculating machine, A. C. Jackson Camera support, W. G. Geier	756,168 : 755,649 :
If You Want the Best Lathe and Drill Camera swing back, photographic, H. W.	i l
Lan. See Oil can.	
BUY WESTCOIT'S Strongest Can opener, R. P. Norton. Candle and shade holder, A. W. Hoffman Candle molding machine, S. H. Leaven-	755,664
Take Car Danes Car C	700.555
and Durability, Cheap and Accurate. Car coupling, auxiliary, J. W. Smith Car coupling, auxiliary, J. W. Smith Car coupling, asfety attachment E. R.	755,805
Westcott Chuck Co., Oneida, N. V., U. S. A. Trammell	755,816
Ask for catalogue in English, French, Spanish or German, FIRST PRIZE AT COLUMBIAN EXPOSITION, 1893. Car coupling stirrup and centering device, railway, W. G. Cory. Car fender, A. E. McLean.	755,622 755,788
PERFECT - PUMP - POWER. Car fender, Heron & Crowley	755,788 755,872 756,060
is attained only in the Car operating mechanism, dumping, S. J.	755,671
They are mechanical car ventilators, hood or injector for, H. B. Rowland.	756,057
pump hot or cold fluid, 'Car Window, street, H. Witte thin or thick. Requires Cars on sidings, means for holding, H.	755,982
no skilled mechanic Most Smelser	755,949
	755,877 755,960
gine attachment. Large Illustrated Catalogue free. B. S. Smith	755,803
TABER PUMP CO., 32 Wells St., Buffalo, N.Y., U. S. A. Carpet sweeper, E. C. Murdick	756,042

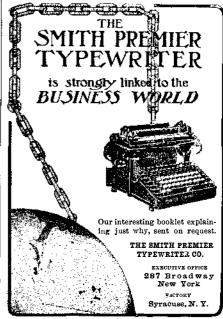


THE PREMO as a Film Camera

By means of a Premo Film Pack Adapter, which is just the size of an ordinary plateholder, any 3½ x4½ or 4x5 Premo becomes a daylight loading film camera. It's then ready for 12 film negatives instead of 2 on glass and you may focus on the ground glass just the same,

Premos have every advantage of both plate and ilm cameras—the drawbacks of neither.

ROCHESTER OPTICAL CO., Rochester, N.Y. Ask your dealer or write us for booklet . "With Your Film in Focus."





Agents Wanted

Responsible men of ability o act as local agents for the No. 5 LINDSAY HIGH

CANDLE-POWER LAMP.

(For Natural, Artificial or Gasoline Gas.) 300 CANDLE-POWER.

Rare chance for hustlers. Lindsay & Company Dept. S, 170 Lake St., Chicago

Instructive Scientific Papers ON TIMELY TOPICS

Price 10 Cents each by mail

HOME MADE DYNAMOS. SCIENTIFIC AMERICAN SUPPLEMENTS 161 and 600 contain excellent articles with full drawings.

PLATING DYNAMOS, SCIENTIFIC AMERICAN SUPPLEMENTS 720 and 793 describe their construction so clearly that any amateur can make them.

YNAMO AND MOTOR COMBINED Fully described and illustrated in SCIENTIFIC Ambrican Supplements 844 and 865. The machines can be run either as dynamos

ELECTRICAL MOTORS. Their Construction at Home Scientific American Supplements 759, 761, 767, 641. THE MAKING OF A DRY BATTERY. SCIENTIFIC AMERICAN SUPPLEMENTS 1601, 1387, 1383. Invaluable for experimental students.

ELECTRICAL FURNACES are fully de-

scribed in Scientific American Supplements 1182, 1107, 1374, 1375, 1419, 1420, 1421, 1077.

MISCELLANEOUS PAPERS ON ACETYLENE GAS will be found in SCIENTIFIC AMERICAN SUPPLEMENTS 1082, 1083, 1084, 1085, 1086, 1015, 1016, 1057.

Price 10 Cents each, by mail

Order through you**r news**dealer or from

MUNN @ COMPANY 361 Broadway New York