Inquiry No. 1899.—For parties to spin a certai material into thread for making mantles.  Inquiry No. 1900.—For a hydraulic press wit accumulator and pump combined.  Inquiry No. 1901.—For manufacturers of motors.		American
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	H. Louder 690,864  Distilling apparatus, J. J. Roake 690,611  Distributing tank, K. G. Barkhausen 690,390  Ditch roller, S. D. McGuire 690,893	Walworth's
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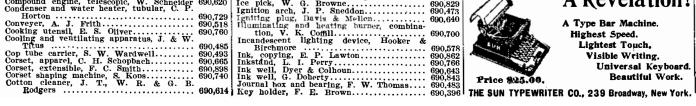


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Railway vehicle life guard, G. Kirby Range boiler, A. C. Badger Ratchet wrench, W. T. Garrett	. 690,738 . 690,628 . 690,647
Register top plate, D. G. Clark	. 690,780 . 690,698 . 690,525
ism for, C. P. Cottrell.  Printing press rolls, means for inking, J. H. Schussler Propulsion, marine, J. J. Astor. Pulley, expansion, S. W. Wardwell. Pulping machine, C. Wurster. Pumping engine, steam, C. C. Worthingto Quitalin salicylle ether, F. Hofman, reissue Quitalin salicylle ether, F. Hofman, reissue Quitalin salicylle ether, F. Hofman, reissue Rail joint, Hickman & Borrow.  Rail joint, Hickman & Borrow. Rail joint, Hickman & Borrow. Railway cradle, marine, J. L. Crandall. Railway, electric, F. M. Ashley. 690,386 Railway, electric, F. M. Ashley. 690,386 Railway, single track, H. H. Teunis. Railway saystem, electric, H. P. Wellma Railway system, electric, H. P. Wellma Railway tralls, grooved rail appliance for street, H. C. Phelps. Railway tie, steel, I. Dinger. Railway tie, steel, I. Dinger. Railway tie, steel, I. Dinger. Railway track jack, Hale & Bartlett. Railway track jack, H	690,793 690,448 690,755
Mackintosh Riveting machine, W. S. McKinney. Roasting pan, J. Herbs. Rock drill, A. C. Bates. Rock drill, A. M. Ballou. Rolls, cakes, etc., machine for making, M	690,755 690,574 690,630 690,687
Rolls, cakes, etc., machine for making, M. Korth Roofing material, F. S. Miller	1. . 690,741 . 690,526
Korth Roofing material, F. S. Miller. Rotary engine, H. W. Van Auken. Sack holder, P. W. Erickson. Sash fastener, J. A. Kemp. Saw, L. R. Sosna. Saw, double cutting band, E. E. Thomas Saw jointer and gage, combined, D. V	690,498 690,412 690,440 690,785
Saw, double cutting band, E. E. Thomas Saw jointer and gage, combined, D. V Solomon Sawmils, haul up chain unloader for, E. Thomas Sawmills, reciprocating lumber mover for.	V. 690,678 V. 690,668
E. Thomas	690.679
Scale, C. G. Strubler	690,480 690,522 er 690,599 690,466
Seal, shackle, A. B. Schofield	690,466 690,577 M. 690,680
Todd Sewing machine for felling, W. Arbetter. Sewing machine loop taker mechanism, V. Grothe Sewing machine shuttle, V. Royle Sewing machine stripper plate, R. G. Woo	690,385 V. 690,722 690,616
Sewing machine tucking guide. R. C. Joh	d- 690,812 n-
Son Sewing machines, finger tip attachment f glove, L. A. Van Praag Shade, W. A. Haywood	690,735 or 690,682 690,725
glove, L. A. Van Praag. Shade, W. A. Haywood. Shade roller bracket support, J. Renner. Show tray, T. S. Coffin. Sifting pulverized ores, etc., apparatus for Jamieson & Odling.	690,529 690,399 or,
Jamleson & Odling Sign, electrically illuminated, J. H. Goeh Sign, street lamp, O. I. Terrell. Sink garbage holding attachment, C. E. C. Skate, O. W. Everett.	+ 690 649
Skate, O. W. Everett	690,711

# As Others

Every letter bears date November, 1901.

Defiance Machine Works, Defiance, 0.

We have received orders from all over the world, through this advertisement, and we consider it the highest class advertising medium that is published in this country. It reaches every class of people that are interested in modern methods. It stands in such high favor with mechanics, that in most cases they have them bound, and after they are once put into book form, it gives the advertiser a standing ad. that lives indefinitely. Then, again, the Scientific American is sold by all the leading bookstores throughout this and foreign countries, and it is simply astonishing how far its influence reaches. We desire to state that we have been many times repaid for the money that we have paid you for advertising in the Scientific American.

Julian F. Denison, New Haven, Conn. Our advertisement brought more intelligent a valuable inquiries than any other paper.

Winton Motor Carriage Co., Cleveland, The only publication in which we have adver-tised continuously. The reason is that re-sults have been good at all times.

Williams Brothers, Ithaca, N. Y.
We are especially impressed by the wide field covered by your circulation, and value your journal as one of the most profitable mediums for advertising that we have ever been able to find.

J. B. Colt Co., New York.

The Scientific American is unquestionably a power of great influence in the commercial world.

William Roche, New York.
Results have not been exceeded by any other
advertising we have done.

Eclipse Mfg. Co., Elmira, N. Y.
In number and quality the returns have been equal to those of any medium and far in advance of many of your competitors.

The Vilter Mfg. Co., Milwaukee, Wis.

A large proportion of the inquiries received came from parties who appeared to be in the market for our goods. We are well pleased.

pleased.

Consolidated Engine-Stop Co., Waterbury, Conn.

We did not believe it possible to receive such large returns from such a small advertisement, from Boston to South Africa.

Wisconsin Wheel Works, Racine Junction, Wis.

Much pleased with the results, both in quantity and quality. Will use much larger space.

Buffalo Gasoline Motor Co., Buffalo, N. Y.
Have traced good share of our sales to the Scientific American, as all advertisements are keyed.

keyed.

Watson McDaniel Co., Philadelphia, Pa.
Brought many inquiries from a new and valued field, heretofore not reached.

W. F. & John Barnes Co., Rockford, Ill.
Its readers are of the bright, studious, alert and interesting class and the inquiries mean business and are not from catalogue seekers.

Lowell Model Works. Lowell Mass.

Lowell Model Works. Lowell, Mass.
Consider the Scientific American to be an advertising medium of the first class.
Vulcan Iron Works Co., Toledo, O.
One of the best advertising mediums we know of. Have had a great many inquiries mentioning the Scientific American.

The Warren Co., Chicago, III.

The advertisement has paid for itself. One order from Russia, another from British Guiana, besides many inquiries.

Guiana, besides many inquiries.

Cyphers Incubator Co., Huffalo, N. Y.

No paper on our list yields a larger per cent of customers from the inquiries sent us.

The readers of the Scientific American mean business when they send for catalogues.

Avery & Jenness Co., Chicago, III.

Inquiries from all over the world, as many as forty-five in one dav. One of the very best mediums for advertising goods in the mechanical line.

mechanicar line.

Savage Arms Co., Utica, N. Y.

Results have leen far ahead of expectations.

Your paper will stand well at the head of the list. Advertising all keyed.

Neustadt-Perry Co., St. Louis, Mo.
Results beyond expectation. Inquiries coming
in weeks after advertisements appeared,
proving that your periodical is kept for continuous reference, which enhances its value.

C. A. Edgarton Mfg. Co., Shirley, Mass.
Results compare favorably with those obtained from such publications as Munsey's, Meclure's, etc.

Merrell Mfg. Co., Toledo, O.
Received great benefit from the small advertisement. Mead Cycle Co., Chicago, Ill.

re kept record of all orders resulting from inquiries from each paper. On this basis, the Scientific American has shown very sat-isfactory results.

Standard Stamping Co., Buffalo, N. Y. Have obtained very good results from our small advertisement, and recommend your paper as a good medium. D. L. Holden, Philadelphia, Pa.

ne of the biggest contracts I have ever have came direct from the advertisements in your paper, not only in America, but foreign countries, as far away as China.

countries, as far away as China.

Niagara Falls Acetylene Gas Machine

Co., Niagara Falls, N. Y.

We can truly say that we have received more benefit during the past four years than from any other advertising medium we have used.

Farr & Farr, Chicago, Ill.

The amount of inquiries that come in to us is astonishing; more than we ever expected.

Draper Mfg. Co., New York.

Inquiries and orders from various parts of the
world resulting from our advertisement
proves the wide circulation of your journal.

Turner Brass Works, Chicago, III.

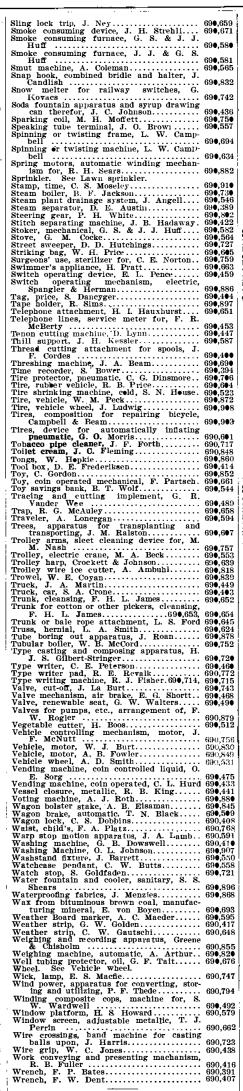
Not only a large number of replies, but very
satisfactory sales. Have rarely had any
advertising pay as well.

Ohio Electric Works, Cleveland, O.
As an efficient advertising medium, it is unap
proached. It is in a class by itself.
Motsinger Device Mfg. Co., Pendleton

We have found no other paper which brings us as many inquiries.

Rhode Island Telephone & Electric Co., Providence, R. I.

Have had more inquiries than from any similar advertising in other papers, and from all parts of the world,



#### DESIGNS.

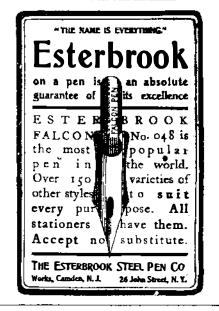
	Advertising puzzle sheet, C. E. Jaques	35,567
đ		
n	Belt, L. Sanders	35,570
n	Belt, B. Wilentshik	35,571
щ	Bottle, K. Kiefer	35,558
	Box opener, W. Hathaway	35,561
e	Burners, bowl for hydrocarbon, W. R. Jeavons	35,563
	Corset, J. M. Van Orden	35,572
e	Drinking vessel, G. Forgach	35,557
ם	Fan casing, A. L. Streeter35,563,	35,564
l.	Garment supporter, F. G. Dietz	35,548
	Hose supporter, A. Hunter	35,549
8	Knife, butter, W. Hathaway	05.554
	Life preserver body, H. A. Ayvad	35,550
	Pail cover, J. S. Roblin	35,561
	Danon from fruit F W Doller	
e	Plowshare lay, W. Gibson, Jr	35,566
t.	Shoe sole, J. S. Busky	
ĭ	Characteristics of the Susky	30,009
•	Spectacles or eyeglasses, nosepiece for, I.	
	Fox	35,553
7	Spoons, forks, or similar articles, handle	1
Ť	for, C. A. Bennett	35,555
,	Spoons, forks, or similar articles, handle for,	
	W. C. Codman	35,556
	Trousers clasp securing bar, H. S. Brew-	00,000
)•		35,547
	ington	05,041
	Vehicle rub iron or fender, Dredge & Burke.	35,567
,	Wall tie, R. Godfrey	35,565
	a.	

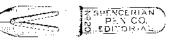
#### TRADE MARKS.

Batteries and electric appliances, certain named, Manhattan Electric Supply Co.. 37,629 Beer, United States Brewing Co., of Chicago 37,619 (Continued on page\_17)



SENSITIVE LABORATORY BALANCE. SENSIFIVE LABORATORY BALANCE.
By N. Monroe Hopkins. This "built-up" laboratory balance will weigh up to one pound and will turn with a quarter of a postage stamp. The balance can be made by any amateur skilled in the use of tools, and it will work as well as a \$125 balance. The article is accompanied by detailed working drawings showing various stages of the work. This article is contained in SCIENTIFIC AMERICAN SUPPLEMENT, No. 1184. Price 10 cents. For sale by MUNN & Co. 361 Broadway, New York City, or any bookseller or newsdealer.





Suitable for your handwriting from a sample card of 12 leading numbers for correspondence, sent postpaid on receipt of 6 cents in stamps.

#### SPENCERIAN PEN CO.

349 Broadway, New York.



SYNCHRONOGRAPH.—A NEW METH-SYNOHRONOURAPH.—A NEW MEII-nod of rapidly transmitting intelligence by the alternat-ing current. A full description of the interesting ap-paratus of Crehore and Squier. Is illustrations. SCIEN-TIFIC AMERICAN SUPPLEMENTS 1114 and 1115. Price 10 cents each. For sale by Muiin & Co. and all newsdealers. Send for new catalogue.



FOLDING CAMERA. - WORKING Drawings showing how to build a folding causera, practical pape; by an annateur for anateurs. 4 illustrations. (Contained in SUPPLEMENT 1421. Price cents For Sale by Munn & Co, and all newsdealers.

GEO. H STAHL, Quincy, Illinois.



#### CYPHERS INCUBATOR,

World's Standard Hatcher.
Used on 86Gov. Experiment Stations in U. Sv. Canada, Australia and New Zealand; also by America's leading politry-men and thousands of others. Gold medal and highest a ward at Pan-American, Oct. 1901. 32-page circular free. Complete catalogue, 196 pages, 8x11 in., mailed for 10c. or book No. 14

OYPHERS INCUBATOR COMPANY, Butado, N. Y., Chicago, Ill., Boston, Mass., New York, M. T.

SET EGGS in the SURE HATCH RUBBLE and a do, and they are making money. Guaranteed for 10 years and batch every hatchash egg. And they are making money. Guaranteed and the sure of the sur Sure Hatch incubator Co., Clay Center, Neb., or Columbus, O

SHOE BLACKING.—FORMULAS FOR liquid and solid blacking are given in SCPPLEMENT Nos. 1213 and 1239. Price II cents each. For sale by Munn & Co. and all newsdea'ers.



BELIABLE INCUBATOR & BROODER CO.

Joy 20 105 Quiney, Illin in. POULTRY PAPER, illustrated, 20 pages, 10 cts. Sample Free. 64-page practical poultry book free to yearly subscribers. Rook alone, 10 cts. Catalogue of poultry books free.
Poultry Advocate, Syracuse, N. Y.

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To those looking for foreign trade:

American manufacturers are still far from improving their opportunities for securing foreign markets.

We send millions of circulars printed in English to those who can't read them, we employ salesmen who can't speak the language of the merchants they hope to interest and we make terms which make it difficult to deal with the United States.

In these and other matters at least two nations are in advance of us.

THE WORLD'S WORK (a magazine of achievement) has collected through its correspondents fresh information, of fundamental importance, about what to do and what not to do in seeking foreign sales. It practically devotes its January (Looking Outward) number to this subject, and this issue is worth hundreds of dollars to those who need it—the American manufacturer with aspirations for sales abroad.

THE WORLD'S WORK may be ordered from newsdealers or direct, 25c., or \$3.00 a year. A blank is annexed for convenience:

	DOUBLEDAY, PAGE & CO., 34 Union Square, New York.
	Enclosed find \$3.00 for a year's subscription to The World's Work.
-	
	Sci. Am. 1-

ELECTRO MOTOR. SIMPLE, HOW TO make.—By G. M. Hopkins. Description of a small electric motor devised and constructed with a view to assisting amateurs to make a motor which might be driven with advantage by a current derived from a battery, and which would have sufficient power to operate a foot lathe or any nucline requiring not over one man power. With 11 figures. Contained in SCIENTIFIC AMERICAN SUPPLEMENT, No. 641. Price 10 cents. To be had at this office and from all newsdealers.



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Write forfree catalogueG, with full particulars. THE CONSOLIDATED SCHOOLS, 156 Fifth Ave., N. Y.

BABBITT METALS.—SIX IMPORTANT formulas. Scientific American Supplement 1123. Price 10 cents. For sale by Munn & Co. and all newsdealers. Send for catalogue.



"WOLVERINE" Gas and Gasoline Engines

The "Wolverine" is the only reversible MarineGas Engine on the market. It is the lightest engine for its power. Requires no licensed engineer. Absolutetysafe. Mfd. by WOLVERINE MOTOR WORKS, 12 Huron Street, Grand Rapids, Mich.

#### DRILLING Machines

Over 70 sizes and styles, for drilling either deep or shallow wells in any kind of soil or rock. Mounted on wheels or on sils. With engines or norse powers. Strong, simple and durable. Any mechanic can operate them easily. Send for catalog. WILLIAMS BROS., Ithaca, N. Y.

METAL POLISHES.—FORMULAS FJR Putz Pomades, Fastes. Liquids, Powders and Soaps, for polishing metals, are contained in SCIENTIFIC AMERICAN SIPPLEMENT Nos. 1281, 1288 and 1281, Price 10 cents each from this office and all newsdealers.



\*\*MEW ROOFS FOR OLD\*\* can be easily accomplished without the aid of a skilled roofer if you will get Warren's Natural Asphalt Stone Surface Ready Roofing



ROTARY PUMPS AND ENGINES. Their Originand Development.—An important series of papers giving a historical resume of the rotary nump and engine from 1588 and illustrated with dear drawings showing the construction of various forms of pumps and engines. 38 illustrations. Contained in Supplements 1109, 1110, 1111. Price 10 cents each. For sale by Munn & Co. and all newsdealers.



#### Blindness

Prevented and Cured By the Great "Actina," an Electrical Pocket Battery which removes Cataracts, Ptervgiums, etc. Cures Granulated Lids. Restores Vision. Positive proof of cures given. No Cutting or Drugging, Eighteen years success. Write for our 80-page Dictionary of Diseases, Free. Address.

NEW YORK & LONDON ELECTRIC ASS'N Dept. 19. Arlington Building, Kapaas City, Mo.



#### SUPPLEMENT

HE CURRENT SUPPLEMENT. No. 1359, is devoted entirely to the Panama-Nicaragua Canal controversy and among the articles are:-

- "The New Panama Canal."
- "The Nicaragua Canal,"
- "The Report of the Isthmian Canal Commission " (carefully abstracted).

There are forty maps, plans, profiles and illustrations and the subject is so treated as to present in concrete and usable form a resumé of a subject which is just now very much in the public eye.

It may be purchased from any newsdealer or will be mailed by the publishers.

PRICE 10 CENTS.

MUNN & COMPANY, Publishers 361 Broadway. New York

#### Syrups, sugar, and molasses, C. E. Coe...... 37,607 LABELS

"Bailey," for planes, Stanley Rule and Level Co.

De Grath's Liniment," for a liniment, A.
B. De Grath

B. De Grath

Phonographic Language Lesson," for phonographic Leords, International Text-book

Co.

Tabasco Pepper," for extract of tabasco

pepper, C. Schertz.

8,889

8,889

8,889

#### PRINTS.

"St. Louis Souvenir Playing Cards," for playing cards, Meyers Brothers Drug Co..... 445

A printed copy of the specification and drawing of any patent in the foregoing list, or any patent in print issued since 1863, will be furnished from this office for 10 cents, provided the name and number of the patent desired and the date in given. Address Munn & Co., 361 Broadway, New York.

Canadian patents may now be obtained by the inventors for any of the inventions named in the foregoing list. For terms and further particulars address Munn & Co., 361 Broadway, New York.



MINTS TO CORRESPONDENTS.

Names and Address must accompany all letters or no attention will be paid thereto. This is for our information and not for publication.

References to former articles or answers should give date of paper and page or number of question.

Inquiries not answered in reasonable time should be repeated: correspondents will bear in mind that some answers require not a little research, and, though we endeavor to reply to all either by letter or in this department, each must take his turn.

Buyers wishing to purchase and attachments.

Buyers wishing to purchase any article not adver-tised in our columns will be furnished with addresses of houses manufacturing or carrying

andresses of houses manufactures.

Special Written Information on matters of personal rather than general interest cannot be expected without remuneration.

Scientific American Supplements referred to may be had at the office. Price 10 cents each.

Books referred to promptly supplied on receipt of urice.

Minerals sent for examination should be distinctly marked or labeled.

(8500) E. O. M. writes: I have two textbooks on physics which disagree. Spottiswoode, of London, had an induction coil made which gave a 42-inch spark. One says it required 5 Grove cells to give the 42inch spark: the other says 30 Grove cells were required. Which is right? A. The statement in Gordon's "Electricity" is that with five Grove cells the coil gave a spark 28 inches long; with 10 cells the spark was 35 inches, and with 30 cells it was 4214 inches long. 2. What difference of potential was required to force the spark across the gap of 42 inches? A. We do not know. Probably hundreds of thousands of volts.

(8501) J. C. A. asks: Please inform me how to make a strong magnet of Jessup steel. I have tried to make some 1/2 inch square by 3 inches long, straight bars, by passing them through a spool of wire with a 300-volt current, by which they were strongly magnetized, but lost almost all magnetism in about three weeks. How can I make such magnets which will retain their strength for a long time? A. Heat the bars to be magnetized to a red heat and plunge them into water. They are then to be magnetized. Straight bars do not retain magnetism well. They should lie in pairs with opposite poles toward each other, side by side, not end to end, or else in pairs with an iron keeper across the poles. They may be laid four in a square with opposite poles against each other. Laid down alone without keepers, the magnetism is rapidly lost.

(8502) S. S. asks: Please tell me whether there is any such thing as an absolute vacuum, and if so, how is it produced? A. It is claimed that an absolute vacuum has been made by chemical means. The gas remaining after exhaustion had been carried as far as possible by means of pumps, was absorbed by chemicals and the space was then empty of gas, a vacuum. Another method has been described. Fill a hard glass tube closed at one end with soft glass. This on solidifying presents the appearance of a glass rod, solid throughout. When this is connected to an air pump and heated so that the soft glass melts, the melted glass will drop from the top of the tube, just as the mercury does in the barometer and Torricellian experiment Upon cooling the soft glass solidifies again leaving a complete vacuum in the upper part of the tube.



If you use a pump for beer, lard acids, starch, petroleum, brewer's mash, tamer's layor, cottouseed oil or fluids, bot or cold, thick or thin you want toget the TABER ROTARY PUMP 

TABER PUMP CODULTALONY, which does the most work at the least expense. Simply constructed Can be run at any desired speed. Perfectskilled workman. Derects guaranteed. Catalogue free. TABER PUMP CO., 32 Wells St., Buffalo, N.Y., U. S. A

HOW TO MAKE AN ELECTRICAL Furnace for Amateur's Use.—The utilization of 110 voit electric circuits for small furnace work. By N. Monroe Hopkins. This valuable article is accompanied by detailed working drawnizs on a large scale, and the furnace can be misde by any amateur who is versed in the use of tools. This article is contained in Scientific American Supplement, No. 1 182. Price 16 cents. For sale by MUNN & CO., \$10 Broadway, New York City, or by any bookseller or newsdealer

MOVING, PICTURE MACHINES AND FILMS MAGIC LANTERNS WANTED OR EXCHANGE HARBACH & CO., 809 Filbert St., Phila., Pa.



MORAN FLEXIBLE JOINT
for Steam, Air or Liquids,
Made in all sizes to stand any desired
pressure.

Moran Flexible Steam Joint Co., Inc'd, 1493d East St., Louisville, Ky.



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SHEETING, GASKETS, TAPE and PISTON PACKINGS. Will stand the highest pressure for either steam or bydraulic work. With for samples and price tist. C. W. TRAINER MFG. CO., (Est. 1874), 88 Fearl St. Boston, U. S. A Experimental & Model Work

Gash Buyers for Farms
or other real estate may be found
through me, no matter where located.
Send description and price and learn my successful
method for finding buyers. W. M. OSTRANDER,
Seth American Building, Philadelphia, Pa.



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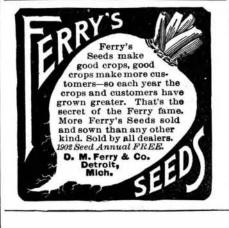
If so we can supply you. All sizes mounted and unmounted, always kept in stock. Remember, we make a specialty of selecting stones for all special purposes. Ask for catalogue The CLEVELAND STONE CO.

2d Floor. Wilshire. Cleveland, O.

"TANDEM" and "PEERLESS" Gas & Gasoline Engines

Northern Engineering Works, 641 Atwater St., Detroit, Mich.

THE STEAM TURBINE; THE STEAM Engine of Maximum Simplicity and of Highes: Thermal Efficiency. By Frof. R. H. Thurston. A valuable series of articles having cuts of some of the more efficient engines of this type—the Parsons', De Laval, Dow, etc.; with exhaustive tables giving the result of tests and much general data on the subject. Contained in SUPPLEENT NOS. 1306, 1307 and 1308. Price 10 cents each. For sale by Munn & Co. and all newsdealers



MAXIMUM POWER-MINIMUM COST. ROTARY ENGINES.—ARTICLES ON If you use a pump for this type of engine, giving many details and illustrathis type of engine, giving many details and illustra-tions, are contained in Supplement Nos. 1158, 1186, 1193 and 1309, Price 10 cents each. For sale by Munn & Co. and all newsdealers.

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as well as Cork Ceilings, are now in vogue among up-to-date architects and builders on account of their durabili-ty, artistic beauty and economy.

NONPAREIL CORK is water-proof, sound-proof and germ-proof; a non-conductor of heat or cold; neiseless and sanitary and is excellent for decorative ceilings and walls and for the floors of houses, churches, schools, etc., and the decks of yachts, etc.

THE NONPAREIL CORK M'F'G CO., Bridgeport, Conn.

If You Want the Best Lathe and Drill



Westcott Chuck Co., Oneida, N. Y., U. S. A. Ask for catalogue in English, French, Spanish or German Filest Prize at Columbian Exposition, 1893.

Now is the time to subscribe to the SCIENTIFIC AMERICAN for the year 1902 Subscription Price, = = \$3 a Year 3 Months Trial, 50 cents

#### ARE YOU INTERESTED?

I have a patented Lifeboat which will wonderfully minimize loss of life from wrecks at sea. Plenty of money in it if properly exploited. Patent for sale. JAS. MITCHELL. SR., Arrow River, Manitoba Co., Can.

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ESTABLISHED 1867 WRITE FOR CATALOGUE OF MODEL SUPPLIES

#### & advice free. Wm. Gardam & Son. 45-51 Rose St., N.Y.

NOVELTIES & PATENTED ARTICLES Manufactured by Contract. Punching Dies, Special Ma-chinery. E. Konigslow & Bro., 181 Seneca St. Cleveland, O.

MATCH FACTORY.—DESCRIPTION of an English factory. SCIENTIFIC AMERICAN SUP-PLEMENT 1113. Price 10 cents. For sale by Munn & Co. and all newsdealers.



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INVENTIONS PERFECTED. ccurate Model and Tool Work. Write for Circular. PARSELL & WEED. 129-131 West 31st St., New York.

Best Drying Machines and Coffee Hullers. Established 1879. S. E. WORRELL, Hannibal, Mo.

**Wonderful Electric Inventions Free** Senc 2-cent stamp for particulars and catalogue.

BUBIER PUBLISHING CO., Box 709, Lynn, Mass.

RUBBER STAMP MAKING. - THIS

article describes a simple method of making rubber stamps with inexpensive apparatus. A thoroughly practical article writer by an amateur who has had experience in rubber stamp making. One illustration. Contained in SUPPLEMENT 1116. Price 10 cents. For sale by Munn & Co. and all newsdealers.

MACHINES, Corliss Engines, Brewers' and Bottlers' Machinery. THE VILTER MFG. CO., 899 Clinton Street, Milwaukee Wis.

MODELS & EXPERIMENTAL WORK. E. V. BAILLARD, Fox Bidg. Franklin Square, New York.

MATCH FACTORY MACHINERY, W. E. WILLIAMS, Mfr., 1001 Monadnock Block, Chicago, U. S. A.

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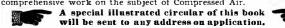
ITS PRODUCTION. USES AND APPLICATIONS. By GARDNER D. HISCOX, M. E. AUTHOR OF "MECHANICAL MOVEMENTS."

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