

Telegraphy and telephony, combined, W. W. Jacques.....	485,279
Telephone, C. W. White.....	485,311
Thill coupling, C. C. Bradley.....	485,368
Thill coupling, E. F. Hopkins.....	485,194
Thill coupling, J. K. Pfeiffer.....	485,426
Thrashing machine band cutter and feeder, F. R. Hill.....	485,499
Ticket holder, M. Lincoln.....	485,202
Tie. See Bale tie.	
Timerecorder, watchman's electric, J. A. Tilden.....	485,591
Tin and terne plates, apparatus for cleaning, T. Jenkins.....	485,387
Tobacco for cigarettes, machine for preparing or reducing and combining, C. G. and A. B. Ojador.....	485,483
Track cleaner, C. E. Bostwick.....	485,528
Track sweeper, W. H. Leigh.....	485,348
Trains, electric danger signal for moving, McCart & Juddins.....	485,473
Trap. See Animal trap. Gopher trap.	
Triplaster, F. A. Stevens.....	485,511
Truck, J. C. A. Deau.....	485,262
Truck, car, A. T. Loyd.....	485,286
Tuyere, J. M. Hartman.....	485,381
Twisting machine to roll, J. E. Fitzgerald.....	485,296
Typewriting machine, Vaughan & Evans.....	485,593
Valve for pneumatic tires, W. E. Gibbs.....	485,540
Valve gear, Unzicker & Masel.....	485,350
Valve gear, steam engine, J. W. Sargent.....	485,438
Valve operating mechanism, engine, E. C. Fasoldt.....	485,579
Valve, slide, H. Moon.....	485,505
Valves, cut-off mechanism for slide, Fletcher & Abell.....	485,287
Vegetable cutting or slicing machine, Smith & Claydon.....	485,590
Velocipede, aquatic, J. F. Breyer.....	485,399
Velocipede, ice, M. B. Gibson.....	485,345
Velocipede, ice, G. Seebick.....	485,335
Velocipede saddle, A. L. Garrio.....	485,186
Vessel hulls, construction of, C. D. Dorford.....	485,462
Vessels, apparatus for raising sunken, Tyler & De Vesian.....	485,398
Wagon, T. B. Moses, Jr.....	485,292
Wagon brake, J. Newell.....	485,332
Wagon, dumping, C. H. Mohr.....	485,294
Wainscoting, enameled iron, F. D. Cook.....	485,259
Wardrobe, D. B. Weighman.....	485,309
Warpers, beam doffer for, J. E. Prest.....	485,225
Watercase pendant, T. A. Hopkins.....	485,581
Water closet cistern, Menzies & Morgan.....	485,493
Water gauge, reflector, E. C. Carleton.....	485,451
Water meter, disk, J. Thomson.....	485,437
Water meter, positive proportional, J. Thomson.....	485,438
Water wheel, C. W. Huson.....	485,196
Water wheel bucket, J. B. Pitchford.....	485,477
Wheel. See Water wheel. Wind wheel.	
Wick lifting device, F. Rhind.....	485,429
Wind wheel, J. Harrison.....	485,380
Windlass, hauling, F. Uhlig.....	485,515
Wine, treatment of sparkling, A. Walfard.....	485,248
Wire reel holder, H. Hanson.....	485,275
Wire reeling and stretching machine, J. Harper.....	485,541
Wire winding apparatus, F. B. Chase.....	485,256
Wrench. See Rigid and ratchet wrench.	

DESIGNS.

Badge, M. C. Shafer.....	21,951
Box, lady's, H. C. Richardson.....	21,964
Box, L. Schwarz.....	21,955
Castanet, G. W. Hull.....	21,953
Monument, L. L. Harrison.....	21,954
Postal card, Girsch & Roehsler.....	21,950
Spoon, Bates & Quimby.....	21,952
Urinal, E. Hammann.....	21,957
Wall paper, C. Booz.....	21,966 to 21,949

TRADE MARKS.

Alcohol, mint, E. De Riquies et Cie.....	21,900
Blue, washing, P. Diamond.....	21,903
Boxes, bottles, atomizers, tubes, and distributors for dispensing powders, liquids, and semi-liquids, McKesson & Robbins.....	21,905
Bronzing liquid or gold paint, W. H. Wythe & Co.....	21,929
Files, chisels, scrapers, cravers, and similar tools, Grobet Freres.....	21,904
Flour and meal, Bonesteel & Turner.....	21,925
Flour, wheat, Buffalo Milling Company.....	21,906
Medicated snuff, A. M. Fisher.....	21,930
Medicinal herb teas, Moki Herb Remedy Company.....	21,922
Pens, steel and other, E. R. Oettinger & Co.....	21,907 to 21,916
Periodicals, weekly, L. Rosenthal.....	21,928
Pills, M. Leprince.....	21,926
Rubber and leather goods, certain named, Page Belting Company.....	21,924
Saws, W. B. Barry.....	21,902
Soap, W. Gossage & Sons.....	21,917 to 21,921
Soap for belt dressing, M. F. Delnow.....	21,923
Suits, boys' and children's, A. Levy & Co.....	21,927
Yarns, knitting and mending cotton, Tucker & Cook Manufacturing Company.....	21,901

A printed copy of the specification and drawing of any patent or pending application for a patent in print issued since 1873, will be furnished from this office for 25 cents. In ordering please state the name and number of the patent desired, and remit to 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, provided they are simple, at a cost of \$40 each. If complicated the cost will be a little more. For full instructions address Munn & Co., 361 Broadway, New York. Other foreign patents may also be obtained.

Advertisements.

Inside Page, each insertion - - 75 cents a line
Back Page, each insertion - - - \$1.00 a line

The above are charges per agate line—about eight words per line. This notice shows the width of the line, and is set in agate type. Engravings may head advertisements at the same rate per agate line, by measurement, as the letter press. Advertisements must be received at Publication Office as early as Thursday morning to appear in the following week's issue.



KEUFFEL & ESSER CO.
NEW YORK
AND CHICAGO.

2 Squares, Triangles, Straightedges, Curves, etc., of Hardwood, Hard Rubber, Celluloid, Steel etc., warranted superior.
Send for price list.



The Cheapest, The Best

A complete Electric Motor and Battery outfit, instructive and entertaining for old and young, operating by means of our patented battery pads, doing away with liquid acids and chemicals. Sent by mail or express, prepaid, on receipt of \$1.25. Electric Novelty Co., Roxbury, Mass., of Toy Motors, Amateur Electro Plating Outfits, etc. Send for catalogue. See "Sci. Am." July 23d



\$85

LATHE

Lathe
Screw Cutting
Automatic Cross Feed, etc.

Seneca Falls Mfg. Co. 569 Water St., Seneca Falls, N.Y.

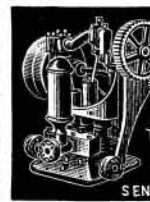
BEATTY Pianos, Organs, \$33 up. Want agents. Cat free. Dan F. Beatty, Washon, N. J.

Improved Screw Cutting
Foot and Power

LATHES

Drill Presses, Shapers, Band, Circular, and Scroll Saws.
Machinists' Tools and Supplies. Lathes on trial.
Catalogue mailed on application.

SEBASTIAN LATHES COMPANY,
120 and 122 Culvert Street, Cincinnati, O.



THE TRIPLE ACTING POWER

BOILER FEED & FORCE PUMP.

THREE PISTONS STEADIEST DELIVERY
CUT METAL VALVES

Wm. BARAGWANATH & SON
46 W. DIVISION ST.
CHICAGO

SEND FOR CIRCULAR.



"THE EXPERT" DATING STAMP.

Illustrated in Scientific Am. Sep. 3rd, p. 145.
THE GREATEST ADVANCE IN RUBBER DATING STAMPS.
COMPLETE FOR EVERY HOUR IN 10 YEARS.
with Die to order. Post-paid \$2.75.

R. H. SMITH MFG. CO., SPRINGFIELD, MASS.
Sole Mfrs Metal-Bodied Rubber Type, &c., &c. Catalogue free.

OIL WELL SUPPLY CO.

91 & 92 WATER STREET,
Pittsburg, Pa.

Manufacturers of everything needed for
ARTESIAN WELLS
for either Gas, Oil, Water, or Mineral
Tests, Boilers, Engines, Pipe,
Cordage, Drilling Tools, etc.
Illustrated catalogue, price
lists and discount sheets
on request.



LIGHTNING WELL-SINKING
MACHINERY MANUFACTURERS.

Hydraulic, Jetting, Revolving, Artesian,
Diamond Prospecting Tools, Engines, Boilers,
Wind Mills, Pumps, Encyclopaedia, 1,000
engravings, Earth's Strata, Determina-
tional quality water, mailed, 25c.

The American Well Works
Aurora, Ill.
11 & 13 S. Canal
Chicago, Ill.
Dallas, Texas

RESEARCHES AS TO THE PROPERTIES
of Alloys.—By Prof. W. C. Roberts-Austen, F.R.S.
An investigation of the effects of small admixtures of
certain elements on the mechanical and physical prop-
erties of metals. With 15 illustrations. Contained in
SCIENTIFIC AMERICAN SUPPLEMENT, No. 556. Price
10 cents. To be had at this office and from all news-
dealers.

Teach Yourself Music
with Buckner's Chart. Simple and easy method. No
previous knowledge of music required. Regular price
\$1.00; our special price only 50 cents. Stamps will do.
Thompson Music Co., 367 Wabash Ave., Chicago.

Steel Type for Writing Machines,
J. D. MALLONEE, Mfr, STOCKTON, N. Y.

ALUMINUM
In all shapes. Manufactured by
Cowles Electric Smelting and Aluminum Co.,
Correspondence solicited. LOCKPORT, N. Y.

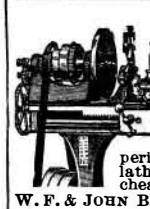
TO BUSINESS MEN

The value of the SCIENTIFIC AMERICAN as an ad-
vertising medium cannot be overestimated. Its circulation
is many times greater than that of any similar journal
now published. It goes into all the States and Territo-
ries, and is read in all the principal libraries and reading
rooms of the world. A business man wants something
more than to see his advertisement in a printed news-
paper. He wants circulation. This he has when he ad-
vertises in the SCIENTIFIC AMERICAN. And do not let
the advertising agent influence you to substitute some
other paper for the SCIENTIFIC AMERICAN, when se-
lecting a list of publications in which you decide it is for
your interest to advertise. This is frequently done for
the reason that the agent gets a larger commission from
the papers having a small circulation than is allowed on
the SCIENTIFIC AMERICAN.

For rates see top of first column of this page or ad-
dress **MUNN & CO., Publishers,**
361 Broadway, New York.



MALLEABLE AND FINE GRAY IRON ALSO STEEL
CASTINGS FROM SPECIAL
THOMAS DEVLIN & CO. FINE TURNING JAPANNING AND
FINISHING
LEHIGH AVE. & AMERICAN ST. PHILA.



FOOT POWER LATHES

For Electrical and Ex-
perimental Work.
For Gunsmiths & Tool
Makers. For General
Machine Shop Work.

High Grade Tools;
elegant in design, su-
perior in construction. The best foot power
lathes made, and quality considered, the
cheapest. Send for catalogue and prices.

W. F. & JOHN BARNES CO., 1999 Ruby St., Rockford, Ill.

LIFE OF AN ANT.—BY E. A. BUTLER.
An entertaining paper on the life of an ant from
the egg to the mature state. With an account of the
curious habits of these insects. With 4 illustrations.
Contained in SCIENTIFIC AMERICAN SUPPLEMENT, No.
557. Price 10 cents. To be had at this office and from
all newsdealers.



FREE

A fine 14k gold plated watch
to every reader of this paper.
Cut this out and send it to us
with your full name and ad-
dress, and we will send you one
of these elegant, richly
jeweled gold finished watches
by express for examination,
and if you think it is equal in
appearance to any \$25.00 gold
watch, may our sample price
be \$4.50, and it is yours. We send
with the watch our guarantee
that you can return it at any
time within one year if not
satisfactory, and if you sell
or cause the sale of six we
will give you One Free. Write
at once as we shall send out
samples for six days only.

**THE NATIONAL MFG
& IMPORTING CO.,**
334 Dearborn Street,
CHICAGO, ILL.

GAS and GASOLINE ENGINES

STATIONARY and PORTABLE. All Sizes.



**Dwarfs in Size, but
Giants in Strength.**

Expense one cent an
hour per horse power and
requires but little
attention to run them.

**Every Engine
Guaranteed.** Full
particulars free by mail.
Mention this paper

VAN DUZEN
GAS & GASOLINE ENGINE CO. Cincinnati, O.



SYLPH CYCLES RUN EASY

Perfection of cycle manufacture; no
need now to ride springless cycles or de-
pend on tires alone for comfort. Sylph
Spring Frame destroys
vibrations. Light, sim-
ple, strong. Catalogue
House, Duquesne City, Pa.
16 G St., Peoria, Ill. AGTS. WANTED



THE ARMSTRONG MACHINES,
For Cutting Off and Threading Pipe.
For Hand
or Power.

No. 1 cuts off and
threads 1 to 3 inch.
No. 2
cuts off and
threads 1 to
4 inch.
No. 3 cuts off
and threads 1 to
6 inch.

Our aim is to make
these machines as good as
any made, and universally acknowl-
edged to be THE BEST. Send for catalogue.

THE ARMSTRONG MFG. CO., Bridgeport, Ct.

The Sebastian-May Co

Improved Screw Cutting
Foot & Power

LATHES

Drill Presses, Chucks, Drills, Dogs,
and Machines' and Apparatus
Outfits. Lathes on trial. Cata-
logues mailed on application.

165 to 167 Highland Ave.,
SIDNEY, OHIO.

SPECIAL NOTICE!

Two handsome photo-engraved displaysheets
entitled,
"Recent Improvements in Air Compressors,"
"Recent Improvements in Rock Drills,"
mailed free to any one who will cut out this
advertisement and mail it to us with his name
and address.


INGERSOLL-SERGEANT DRILL CO.
No. 10 Park Place, New York, U.S.A.



ROCK DRILLS

AIR COMPRESSORS &
GENERAL MACHINERY FOR
MINING, TUNNELING,
QUARRY & RAILROAD WORK

RAND DRILL CO 23 PARK PLACE NEW YORK



**SETS OF CASTINGS OF
MODEL ENGINES
CATALOGUES
FREE.**

ALSO TOOLS,
GEAR WHEELS & PARTS OF MODELS

GOODNOW & WIGHTMAN

SECOND-HAND MACHINERY
FOR SALE AT VERY LOW PRICES.

One 72x72x16 Iron Planer; one 60x30x20 Iron Planer;
one 48 in. Swing Holly Lath; one 1 1/2 in. diameter, 30
in. stroke, Single Cylinder Poppet Valve. Horizontal
Steam Engine, good as new. Write for prices.

HOLLY MANUFACTURING CO., LOCKPORT, N. Y.



ALANSON CARY
MANUFACTURER OF
STEEL SPRINGS
OF EVERY DESCRIPTION

240 & 242 W. 29TH ST. NEW-YORK

WHAT ELECTRICITY IS.—BY W. W. JACQUES.
An interesting discussion of the subject, illus-
trated with some new experiments. Contained in SCIENTIFIC
AMERICAN SUPPLEMENT, No. 557. Price 10
cents. To be had at this office and from all newsdealers.



**CHANDLER'S
Micrometer Holder**

It allows the hand to be free
to use the adjusting screw
while the other holds the
work. Price 50 cents.

CHANDLER & FARQUHAR
No. 179 Washington Street,
BOSTON, MASS.
Send for Catalogue of Tools.



A MODERN BATH.
The Latest and Best.

Quick self-heating or Toilet Cab-
inet in place of Heater. No bath
room required. Ornamental, in-
expensive, complete, practical. Desir-
able for city or town.

Send 2 ct. stamp for catal.
The Mosely Folding
Bath Tub Co.,
186 So. Canal St., Chicago.

Perfect Newspaper File

The Koch Patent File, for preserving Newspapers, Mag-
azines, and Pamphlets, has been recently improved and
price reduced. Subscribers to the SCIENTIFIC AMER-
ICAN and SCIENTIFIC AMERICAN SUPPLEMENT can be
supplied for the low price of \$1.50 by mail, or \$1.25 at the
office of this paper. Heavy board sides; inscription
SCIENTIFIC AMERICAN in gilt. Necessary for
every one who wishes to preserve the paper. Address
MUNN & CO., Publishers SCIENTIFIC AMERICAN.

PERFORATORS OF ALL METALS

For Cotton, Oil and Rice Mills, Sugar Houses, Distilleries, Phosphate and Fertilizer
Works, Mining and Concentrating, Gas and Water Works, Elevators, Threshers, Sepa-
rators, Corn Shellers, and all kinds of Grain Cleaning Machinery. Heavy steel and Iron
Plates and Cylinders for Screening Ore, Coal, Stone. For Filters, Strainers, Ventila-
tors, Oil, Gas and Vapor Stoves and all special purposes. Special sizes for Coffee Clean-
ing and Roasting Machinery. Perforated Tin and Brass.

The Harrington & King Perforating Co., Chicago, and 284 Pearl St., N.Y.

OIL-LIME-ELECTRIC

MAGIC

LANTERNS, STEREOPTICONS
AND VIEWS.

Large Catalogue Free.

J. B. COLT & CO. 161 Beekman Street, N. Y. City.
189 La Salle Street, Chicago, Ill.

FOR RENT, WATER POWER.—Day use
of 250
h. p. (night power used for Electric Light plant). Good
railroad facilities. Town of 6,000 population. Address
Riverside Water Company, Riverside, California.



WOODEN TANKS


FOR RAILROADS,
WATER WORKS,
MILLS, ETC.

LARGE WATER TANKS,
PLANS & SPECIALTY.

SPECIFICATIONS FURNISHED
FOR FOUNDATIONS & TOWERS.

W. E. CALDWELL & CO.
No. 217 E. MAIN ST. LOUISVILLE, KY.

NOW READY!
A NEW AND VALUABLE BOOK.



THE SCIENTIFIC AMERICAN
CYCLOPEDIA
OF
RECEIPTS,
NOTES AND
QUERIES.

12,000 Receipts. 680 Pages. Price \$5.

This splendid work contains a careful compila-
tion of the most useful Receipts and Replies given
in the Notes and Queries of correspondents as pub-
lished in the SCIENTIFIC AMERICAN during the
past fifty years; together with many valuable and
important additions.

Over Twelve Thousand selected receipts
are here collected; nearly every branch of the use-
ful arts being represented. It is by far the most
comprehensive volume of the kind ever placed be-
fore the public.

The work may be regarded as the product of the
studies and practical experience of the ablest chem-
ists and workers in all parts of the world; the in-
formation given being of the highest value, ar-
ranged and condensed in concise form convenient
for ready use.

Almost every inquiry that can be thought of,
relating to formulae used in the various manu-
facturing industries, will here be found answered.

Instructions for working many different pro-
cesses in the arts are given.

It is impossible within the limits of a prospectus
to give more than an outline of a few features of
so extensive a work.

Under the head of Paper we have nearly 250 re-
ceipts, embracing how to make paper maché; how
to make paper water proof and fire proof; how to
make sandpaper, emery paper, tracing paper,
transfer paper, carbon paper, parchment paper,
colored papers, razor strop paper, paper for doing
up cutlery, silverware; how to make luminous
paper, photograph papers, etc.

Under the head of Inks we have nearly 450 re-
ceipts, including the finest and best writing inks
of all colors, drawing inks, luminous inks, invis-
ible inks, gold, silver and bronze inks, white inks;
directions for removal of inks; restoration of
faded inks, etc.

Under the head of Alloys over 700 receipts are
given, covering a vast amount of valuable infor-
mation.

Of Cements we have some 600 receipts, which
include almost every known adhesive preparation,
and the modes of use.

How to make Rubber Stamps forms the subject
of a most valuable practical article, in which the
complete process is described in such clear and ex-
plicit terms that any intelligent person may readily
learn the art.

For Lacquers there are 120 receipts; Electro-Met-
allurgy, 125 receipts; Bronzing, 127 receipts; Pho-
tography and Microscopy are represented by 600
receipts.

Under the head of Etching there are 55 receipts,
embracing practical directions for the production
of engravings and printing plates of drawings.

Paints, Pigments and Varnishes furnish over
800 receipts, and include everything worth know-
ing on those subjects.

Under the head of Cleansing over 500 receipts
are given, the scope being very broad, embracing
the removal of spots and stains from all sorts
of objects and materials, bleaching of fabrics,
cleaning furniture, clothing, glass, leather, metals,
and the restoration and preservation of all kinds
of objects and materials.

In Cosmetics and Perfumery some 500 receipts
are given.

Soaps have nearly 300 receipts.

Those who are engaged in any branch of industry
probably will find in this book much that is of
practical value in their respective callings.

Those who are in search of independent business
or employment, relating to the home manufacture
of sample articles, will find in it hundreds of most
excellent suggestions.

Send for descriptive circular.

MUNN & CO., Publishers,
SCIENTIFIC AMERICAN OFFICE,
361 Broadway, New York.



IMPROVED CHARTER
GAS ENGINES

USING GAS, COAL GAS, NATURAL GAS,
PRODUCER GAS

RELIABLE, SAFE,
ECONOMICAL, SIMPLE

H. W. CALDWELL & SON.
SOLE MFRS.
WASHINGTON & UNION STS. CHICAGO, ILLS.