

Advertisements.

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received at Publication Office as early as Thursday
morning to appear in the following week's issue.

Victor Bicycles

Are first in tires and improvements. The
best pneumatic with inner tubes remov-
able through the rim. If you are going
to ride why not ride the best?

Victor catalog is yours for the asking.

Overman Wheel Co., Boston, Washing-
ton, Denver, San Francisco. A. G. Spalding
& Bros., Chicago, New York, Philadelphia.

COLD FORGED PRODUCT.

"Rogers' Drive Screw."

Patented May 10, July 19, 1887;
July 10, 1888;
July 19, 1892.

It will turn like a screw
into wood when driven
with a hammer, and
will not break the
fibers of the
wood.

For applying steps to Elec-
tric Light Poles, it has no supe-
rior.

Send for samples to

AMERICAN SCREW CO.
PROVIDENCE, R. I.



**ALL ARITHMETICAL
PROBLEMS**
solved rapidly and accurately
by the Comptometer. Saves
60 per cent of time and entire-
ly relieves mental and ner-
vous strain. Adapted to all
commercial and scientific
computation. Why don't you
get one? Write for pamphlet.
FELT & TARRANT MFG. CO.
52-56 ILLINOIS ST. CHICAGO.

THE WILMOT & HOBBS MFG. COMPANY

ESPECIALLY ADAPTED TO THE
PUSH ROD & ROLLER SYSTEM
HOT ROLLED BAND, STRIP
AND PLATE STEEL
GREATLY IMPROVED BY
THE WILMOT & HOBBS SYSTEM
OF QUALITY STEEL WORKS OF CHICAGO
MASTERS OF THE ART OF ROLLING STEEL

COLD ROLLED SHEET AND STRIP STEEL

FOR OFFICIAL, FRESH, STAMPED, DRAWN WORK ETC.



LARGE CONTRACTS SOLICITED FOR AUTOMATIC, HEAVY & DIFFICULT SHEET METAL
BLANKED, STAMPED & DRAWN WORK, TUBES & NICKEL & BRASS PLATING,
TINNING, JAPANNING & DIE MAKING. BRIDGEPORT, CONN.

Good breeding

appears in a sense of propriety—

the fitness of things; it shuns dis-
play and extravagance; practices
economy as "good form." Think
how a trivial accident adds to the
expense of a hundred-dollar watch!
Wouldn't it be good sense to sub-
stitute during busy hours—and on
your journeyings—an accurate,
tasteful, low-priced timepiece?—
Your jeweler will show you the ad-
vantage of the new, quick-winding
Waterbury over others.

For yourself, or "better self,"
child, or friend, you can find
nothing more appropriate.—
Every jeweler sells it in
styles for all tastes—but no
mean styles; filled gold, coin-
silver, etc. \$25 down to \$4.

PATENTS!

MESSRS. MUNN & CO., in connection
with the publication of the SCIENTIFIC
AMERICAN, continue to examine improve-
ments, and to act as Solicitors of Patents
for Inventors.

In this line of business they have had forty-five years'
experience, and now have unequalled facilities for the
preparation of Patent Drawings, Specifications, and the
presentation of Applications for Patents in the United
States, Canada, and Foreign Countries. Messrs. Munn
& Co. also attend to the preparation of Caveats, Copy-
rights for Books, Labels, Reissues, Assignments, and
Reports on Infringements of Patents. All business in-
trusted to them is done with special care and prompt-
ness, on very reasonable terms.

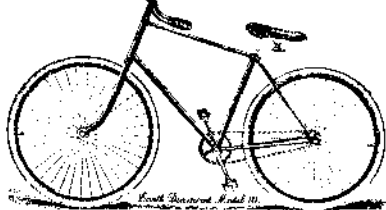
A pamphlet sent free of charge, on application, con-
taining full information about Patents and how to pro-
ceed; full directions concerning Labels, Copyrights,
Designs, Patents, Appeals, Reissues, Infringements,
Assignments, Rejected Cases. Hints on the sale of
Patents, etc.

We also send, free of charge, a Synopsis of Foreign Pa-
tent Laws, showing the cost and method of securing
Patents in all the principal countries of the world.

MUNN & CO., Solicitors of Patents.

361 Broadway, New York.
BRANCH OFFICES:—Nos. 622 and 624 F Street, Pa-
cific Building, near 7th Street, Washington, D. C.

LOVELL DIAMOND CYCLES



HIGHEST GRADE. LOWEST PRICES.

FOR LADIES OR GENTLEMEN

Pneumatic Tires, \$115, \$100, \$85.
Cushion Tires, 105, 90, 75.

John P. Lovell Arms Co., Manufacturers
BOSTON, MASS.

Cycle Catalogue Free.

AGENTS WANTED

STATIONARY
and PORTABLE

PETROLEUM MOTORS.

NO
BENZINE

The most Reliable, Compact, and Economical
Motor for all Industrial Purposes.



Model 1892.



No Soot, No Smoke, No Coal, No Engineer.

We also manufacture IMPROVED GAS ENGINES.

Our Motors will be exhibited at Columbian Exposition, Chicago, No. 1536.

J. M. GROB & CO., Mfrs. LEIPZIG-EUTRITZSCH (GERMANY).



Portable Oil Engine.
Shipped ready mounted.

LINK-BELT MACHINERY CO.

CHICAGO.



Link-Belting & Sprocket Wheels
Elevators and Conveyors
Rope Transmissions
Special Mining Machinery
Special Woodworking Machinery
Gear, Pulley, Sheave and Fly
Wheel Castings. Send for Circular "C."

The Sample Tells the Story

A sample of Dixon's pure flake lubri-
cating Graphite, with an interesting and
instructive pamphlet showing the expe-
rience of practical and scientific men in
using this wonderful lubricant,
sent free of charge.

JOS. DIXON CRUCIBLE CO.
JERSEY CITY, N. J.



"IMPROVEMENT THE ORDER OF THE AGE."

The Smith Premier Typewriter

Embodies the most Progressive Mechanical Principles.
All the Essential Features Greatly Perfected.
Perfect and Permanent Alignment.

Easiest Running, and Nearly Silent.

All type cleaned in Ten Seconds without Soiling the Hands.

The Smith Premier Typewriter Co., Syracuse, N. Y., U. S. A.

We have 20 branch offices in the principal cities throughout the United States.

No one ever wrote **1000 Letters** an Hour,

that is, unless they first wrote one and then copied the rest on an

EDISON MIMEOGRAPH

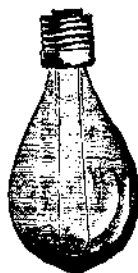
Invented by Thos. A. Edison. For Daily Office Use in duplicating both handwriting and typewriting.
Anybody can operate it. Simple—Compact—Cleanly—Cheap. Endorsed by over 90,000 users.
Catalogues and Samples of Work sent free upon application. Manufactured only by the A. B. DICK CO., 154 E. Lake St. Chicago. Branch Offices, 47 Nassau St., N. Y. City, 117 So. Fifth St., Phila.



SAWS Wanted 50,000 Sawyers
send us their full address for a copy of Em-
erson's 127 Book of SAWS, new 1892 edition.
We are first to introduce NATURAL
GAS for heating and tempering SAWS with
wonderful effect upon improving their qual-
ity and toughness, enabling us to reduce
prices. Address: **EDWARD SMITH
& CO. (Limited), Beaver Falls, Pa.**

The Orcutt Comp's
Leading Lithographers
CORRESPONDENCE SOLICITED—Chicago.

AGENTS WANTED FOR FINE TOOLS IN EVERY SHOP.
C. H. BESLY & CO.
CHICAGO, ILL. U.S.A.



THE EDISON INCANDESCENT LAMP

IS THE ONLY INCANDESCENT LAMP LAWFULLY MADE.

All others infringe the Edison Patents, and are counterfeits.

THE RIGHT OF THE EDISON COMPANY TO AN INJUNCTION AGAINST
INFRINGEMENTS HAS BEEN DETERMINED BY THE U. S. CIRCUIT COURT OF
APPEALS. COPIES OF DECISIONS SENT ON APPLICATION.

GENERAL ELECTRIC COMPANY.

BRANCH OFFICES:

44 Broad Street, New York.
173 and 175 Adams Street, Chicago, Ill.
24 West Fourth Street, Cincinnati, O.
15 First Street, San Francisco, Cal.
420 Atlantic Avenue, Boston, Mass.
549 Arch Street, Philadelphia, Pa.
401 4th Street, St. Paul, Minn.
123 F Street, N. W., Washington, D. C.
Masonic Temple, Denver, Colo.

All business outside the United States transacted by Thomson-Houston International Co., 44 Broad St., New York.

1893 NEW MAIL MODEL



Highest Quality and Handsomest Light Roadster of the Year.
Men's and Ladies' pattern, Cushion Tires, \$105
Pneumatic " 125
Boys' High Grade New Mail, Cushion " 55
Send for catalogue. **WM. READ & SONS, Mfrs.**
107 Washington Street, Boston, Mass.

OUTDOOR JOY

He or she who cycles
not, knows little of the
grandest pleasure to
mortal permitted. He
or she who rides not a
Columbia knows not
of "winged flight on
bands of everlasting
steel," for Columbias
are sound.

Book about Columbias free at
Columbia agencies. By mail for two
2-cent stamps. Pope Mfg. Co., Bos-
ton, New York, Chicago, Hartford.

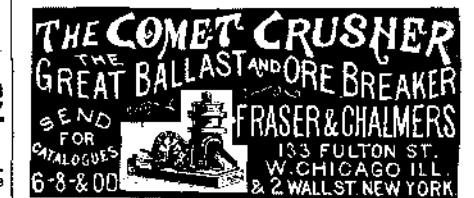
The American Bell Telephone Company

125 MILK ST., BOSTON MASS.

This Company owns the Letters Patent
No. 186,787, granted to Alexander Graham
Bell, January 30, 1877, the scope of which
has been defined by the Supreme Court of
the United States in the following terms:

"The patent itself is for the mechan-
ical structure of an electric telephone to
be used to produce the electrical action
on which the first patent rests. The third
claim is for the use in such instruments
of a diaphragm, made of a plate of iron
or steel, or other material capable of in-
ductive action; the fifth, of a permanent
magnet constructed as described, with a
coil upon the end or ends nearest the
plate; the sixth, of a sounding box as de-
scribed; the seventh, of a speaking or
hearing tube as described for conveying
the sounds; and the eighth, of a perma-
nent magnet and plate combined. The
claim is not for these several things in
and of themselves, but for an electric tel-
ephone in the construction of which these
things or any of them are used."

This Company also owns Letters Pa-
tent No. 463,569, granted to Emile Ber-
liner, November 17, 1891, for a Combined
Telegraph and Telephone; and controls
Letters Patent No. 474,231, granted to
Thomas A. Edison, May 3, 1892, for a
Speaking Telegraph, which cover funda-
mental inventions and embrace all forms
of microphone transmitters and of car-
bon telephones.



THE COMET CRUSHER
THE GREAT BALLAST AND ORE BREAKER
SEND FOR CATALOGUES
6-8-200
Mention the SCIENTIFIC AMERICAN.

SCIENTIFIC EXPERIMENTS.—DE-
scription of some simple and easily performed scientific
experiments. Foucault's pendulum, exchange of water
and wine, the bird in the cage, the five-pointed star, the
sum of the angles of a triangle, surface of the sphere,
with 6 illustrations. Contained in SCIENTIFIC AMER-
ICAN SUPPLEMENT, No. 275. Price 10 cents. To be
had at this office and from all newsdealers.

PATENT JACKET KETTLES

Plain or Porcelain Lined.
Tested to 100 lb. pressure. Send for Lists.

HARROW'S SAWERY CO.
S. Front & Reed Streets, Philadelphia, Pa.



W. F. & JOHN BARNES CO., 1069 Ruby St., Rockford, Ill.

PRINTING INKS.

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BENJ. JOHNSON & CO.'S INK, Tenth and Lombard
Sts., Philadelphia, and 47 Rose St., opp. Truane, New York