易usimess and extsual. The Charge for Insertion under this head is one Dollar a linefor each insertion, about cight wordst to o line.
Advertisements must be received at tubicat ion offce Advertisements must me reciveca at puibicication iffice
Portable and Stationary Engines; Boilers of all kinds; Drawings and Engravings of Mnchinery a specialty Drawings and Engravings of Snininery a speciaty
Pemberton $\&$ scott. draughtsmen 37 Pars Row, Room 30 . Alcott's Turbine received the Centennial Medal.
Wanted. - Second Hand Screw or Lever Press for die work. 6 in. space,
New York city.
For Sale-36" 48 Horizontal High Pressure Condensed Engine: ve.
St.. Philadelphia.
For Sale-State Rights of Mathews' Monitor Wind-
mill. Address D. Bennett Bancroft, Almont. Mich. Four Horse Power Engine and Boiler, N. Y. Safety Steam Power Co.'s make; good as new: for sa.
gain. H. M. Quackenbush. Herkimer. N. Y.
Wanted, Business.-Will buy Inventions or Manufacture on Royalt
chine Works.
Address all orders for the Eclipse Engines, described in Sci. Am. of April 6. 1878 , to
Coin. Send for circulars.
Blower Wanted.-Second-hand Noiseless Fan to feed Boiler. Frank Haynes, Box 2739. Boston, Mass.
Manufacturers' special interest to address Bentel,
Margedant \& Co., Hamilton, Ohio. for the best and latest Margedant \& Co.., Hamilton, Ohio. for
improved Wood Cutting Machiners.
Makers of Steel Thimbles will please send their ad
dress to Henry Kennedy. Fairview. Erie Co., Pa. dress to Henry Kennedy, Fairview. Erie Co., Pa.
Wanted.-Woolen Mill Superintendent; one thoroughly conversant with the manufacture of all classes of as to salary, P O. Box 1926, N. Y.
For Sale- $60^{\prime \prime}$ Boring Lathe, $\$ 100 ; 18^{\prime \prime}$ x9 ft. La the,
$8185 ; 8 \mathrm{ft}$. Planer, 8350 . At Shearman's, 132 N .3 d St., Philadelphia.
$\$ 10,000$.-A manufacturing company having room and power to spare, desire to find some additional staple ar-
ticle to make affording good proft. and that can be extal furnish if desired. Address P. O. Drawer 417, Bridgeport. Conn.
Corliss Engine Builders, with Wetherill's improve-
ments, Engineers, Machinists, Iron Founders, and Boiler
Makers. Robt. Wether II $\&$ Co., Chester, Pa. Makers. Robt. Wether II \& Co., Chester, Pa.
24 inch Second-hand Planer, and 12 inch Jointer, or Buzz Planer, both in frst-class orde
Margedant \& Co., Hamilton, Ohio.
For Town and Village use, comb'd Hand Fire Engine a Henches.-The Lipsey "Reliable" is strongest and
best. Sixinch sample by mail 60 . best. Sixinch sample by mail 60 cents. Roper Cal
Engine ManufacturingCo., 91 Washington St., N. Y
Carriage Azles, Springs, Bolts. Wanted full particulars and prices of machines used in the manufacture of
above. Address Selby \& Co., Longmore St., Birming. above. Adares
Cornice Brakes. J.M. Robinson \& Co., Cincinnati, O.
Friction Clutches warranted to drive Circular Log Saws direct on the arbor, and Upright Mill Spindles, which can be stopped instantly; Safeety Elevators, and
Hoisting Machinery. D. Frisbie \& Co., New Haven, Ct.
Union Eyelet Company, Providence, R. I., Manufac-
For the best Bone Mill and Mineral Crushing Ma-chines-five sizes, great var
More than twelve thousand crank shafts made by
Chester Steel Castings Co. nowrunning; 8 years'constant use proves them strongerand more durable than wrought ron. See adverisement, page 27 .
Diamond Planers. J. Dickinson, 64 Nassau St., N. Y. Machine Cut Brass GearWheels for Models, etc. (New
List.) D. Gilbert \& Son., 212 Chester St., Phila., Pa.
Boilers \& Engines cheap. Lovegrove \& Co., Phila.,Pa. Welaless Cold-drawn Steel Boiler and Hydraulic Tubes. Leng \& Ogden, 212 Pearl St., N. Y.
Skinner Portable Engine, Improved, 21-2 to 10H. P.
Skinner \& Wood, Erie, Pa. Improved Wood-working Machinery made by Walker
Bros., 73 and 75 Laurel St. Philadelphia, Pa.
ForPower\&Economy,Alcott's Turbine,Mt.Holly,N.J. Walrath's Improved Portable Engines best in market; to 8 H. P. Peter Walrath, Chittenango, N.
Bolt Forging Machine \& Power Hammers a
Bolt Forging Machine \& Power Hammers a specialty.
Send for circulars. Forsaith \& Co., Manchester, N. H. The Cameron Steam Pump mounted in Phosphor Painters'Rapid Graining Process. J.J.Callow,Clev',, $\mathbf{O}$.
Painters' Rapid Graining Process. J.J.Callow,Clev'd, O.
For Solid Wrought Iron Beams, etc., see advertisement. Address
lithograph, etc.
John T. Noye \& Son, Buffalo, N. Y., are Manufacturers of Burr Mill Stones and Flour Mill Machinery of anl
kinds, and dealers in Dufour \& Co.'s Bolting Cloth. Send for largeillustrated catalogue
 Emery Wheel - other kinds imitations and inferior. Caution,-Our name is stamped in full on all our best Standard Belting, Packing, and Hose. Buy that only.
The best is the cheapest. New York Belting and PackThe best is the cheâpest. New York Beltin
ing Company, 37 and 38 Park Row, N. Y.
$1,0002 \mathrm{~d}$ hand machines for sate. Send stamp for de-
scriptive price list. Forsaith \& Co., Manchester, N. H. Steel C atings from one ib. to five thousand .bs. In-
valuable for strength and durability. Circulars free. Pittsburgh Steel Casting Con., Pittsburgh, Pa.
For Best Presses, Dies, and Fruit Can Tools, Bliss \& Williams, cor. of Plymouth and Jay Sts., Brooklyn, N.F.
Hydraulic Presses and Jacks, new and second hand.
Lathes and Machinery for Polishing and Buffing metals. Best Turbine Water Wheel, Alcott's, Mt. Holly, N. J.

Talley's Hydraulic Engine (see description and cut
arch 9, 1888), as a simple, cheap, effective and economicalch power is unsurpasped, , and is meeting with qreat suc-
cess. Economy Hydraulic Fingine Co., Kansas City, Mo. Sperm Oil, Pure. Wm. F. Nye. New Bedford, Mass Bound Volumes of the Scientific American.-I have on hand bound volumes of the Scientiffc A merican, which 1 will sell (singly or together) at \$1 each, to be sent by express. See advertis.
P. O. Box $773, \mathbf{N} . \mathbf{Y}$.

## NEW BOOKS AND PUBLICATIONS.

Die Sahara, oder Von Oase zo Oase. Von
Dr. Josef Chavanne. A. Hartleben's
Verlag in Wien, Pesth und Leipzig.
1878. Lieferung I. \& II.
Two widely separated portions of

Two widely separated portions of the earth are at present, more prominen tly than all others, engaging the attention of explorers-the Arctic regions, and the mysportion of the latter country, full of importance and interest both from its extent and remarkable natural characters, the author has devoted his book entitled "The Sahara, or From Oasis to Oasis." There is, perhaps, no region of the globe about which more erroneous ideas popularly exist thanregarding the Sahara. The
notion usually held is precisely that of the old Roman notion usually held is precisely that of the old Roman
geographers, who picture it as a geographers, who picture it as a boundless plain over
which the wind continuously and sportively chases which the wind continuously and sportively chases
clouds of sand. The truth is, however, that we find clouds of sand. The truth is, however, that we find
here conjoined the sharpest contrasts of landscape character. Every gradation of landscape form is rep-resented-Alpine scenery in no wise inferior to that of Switzerland, wild, deep, rocky valleys, large and extended mountains with snow-crowned summits, areas
of luxuriant vegetation, a wealth of water which maniof luxuriant vegetation, a wealth of water which mani-
fests itself under the form of lakes and rivers; then, a fests itself under the form of lakes and rivers; then, a
few hours farther on, almost imperceptibly, we reach bare, waterless plains, destitute of organic life and dot-
ted with sandy dunes. A long residence and travels of many months in the northwestern part of the Desert have encouraged the author to sketch, in a popular,
easily nnderstood, and somewhat extended form, a picture of the Sahara in its entirety which shall be true to nature. It is not his intention to give a description which shall meet the demands of the exact sciences-
the book is rather designed to present to the gaze of the general reader a corret teristics of every part of the Sahara, and the life, man-
nera. and customs of its inhabitants. Where words alone fail to give a correct idea of a landscape, a type of the people, scenes of domestic life, or forms of vegeta-
tion, illustrations will be added to the text. The complete work will contain seven colored plates, sixty-four text illustrations, and a map of the Sahara. Theentire work will be issued in 18 parts, of about 32 pages Unclaimed Money. A Handy Book for Heirsat Law, Next of Kin, and Persons
in Search of a Clew to Unclaimed Money.
in Search of a Clew to Unclaimed Money.
By Edward Preston. London: Reeves \& Turner.
The author, who has made a specialty of the subject a large amount of curious, interesting, and valuable information on unclaimed money, eccentric wills, and such kindred topics. Although evidently prepared
more especially to meet the wants of the English people, it may not prove less valuable to some of our own countrymen, particularly those who are connected by ties of consanguinity with the "mother country,"
and who may perhaps, for that reason, have "great expectations " from that quarter.
Arguments before the Committee on
Patents of the Hodse or
 pp. 355. Washington City: Thos. Mc-
Gill \& Co. We have here the arguments of Messrs. J. H. Ray-
a, G. H. Christy, C. C. Coffln, H. D. Hyde, J. J. Storrow, George Payson, C. S. Whitman, A. H.Walker Elisha Foote, Chauncey Smith, and S. A. Hurlbut, for and against the bill to amend the patent laws, now be-
fore the House of Representatives. As we shall refore the House of Representatives. As we shall re-
view at considerable length elsewhere the facts and arguments presented by these gentlemen, we need say
no more here than that the volume contains very much no more here than that the volume contains very much prosperity of our country at heart.
Messrs. W. Holberton \& Co., of 117 Fuiton street, this
cit-, have issued a new and atalogue and handbook for sportsmen, which their fully recommend to all desiring guns, fishing tackle, ca.ap outfits, sportsmen's clothing, sporting books,
eto, asan excellentmanual showing the best and most etc., asan excellent manual showing the best and most
approved articles of the kind. Mr. Holberton is an experienced fisherman, and his advice may be relied upon when selection of goods is left to him, and at the same
time his knowledge enables nim to offer a stock of all thatis new and useful of the latest improvements in sporting tackle. The catalogue is finely illustrated and contains several excellent practical papers on
shooting, and camping. Its price is 15 cents.

## 

D. C.-By the application of the following rule you can solve the examples: Horse power=(area
ot piston in square inches) $\times$ (speed of piston in feet per of piston in square inches) $\times$ (speed of piston in feet per
minute) $\times$ (mean pressure of steam during stroke in lbs per square inch) $\div 33,000$.-J. L. \& Co.-Your best plan before making a change, is to have your engine and boiler tested, since it is possible that the engine is
wasteful, so that the boiler may be large enough. $-J$. W. S.-We could not do justice to the subject in these columns. If you have no opportunity to visit a rope-
walk, consult some good encyctopedia.-S. B. and J. S. A.-See answer No. 67, Scientipic American, April - You will find the and 219, current volume.-C. E. 'T vol. 36, of Scientifto American. We have not much


ERICAN, June 30, 1877.-G. I. W.-You donot send suff proximately how air pump,but you can calculate apminute, and then make an air pump of sufficient capacity to detiver from 35 to 40 times as much weight of water.T. C.-It is difflcult to give a simple explanation, free
from analysis, that is satisfactory, and the subject from analysis, that is satisfactory, and the subject would require too muchspacefor these columns. will find a popular description in Johnson's Cyclopedia.

- J. D. W.-Any kind of hide that is thick enough can be made to answer. The best qualities of lace eather derive many of their advantages from the car are not positive about the sample.-J. G. R.-You and Personal " column.-J. J. J.-It is probable that the circulation will be imperfect with the arrangement described, unless the pipes are quite large.-S. E. W.-
If you will address a manufacturer you may obtain in If you will address a manufacturer you may obtain in
formationon the points referred to in your letter.-J.J W.-Consult Nugent's " Treatise on Optics."-R. K. F -The problem is one of those quibbles which can never themo American, vol. 27, No. 21, p. 330, and other issues -W. H. D.-See answers Nos. 19and 22, p. 155, ScIentific American, of March 9,1 \%8.-H. P. C.-The pre mises on which your questions are put are incorrect.
It is impossible to straighten the rope.-W. B. P.-See Surplem ent, No.20, p. 315. - "Cincinnati."-It appear to us that the buildingwould be safer without lightning rods than it would be with rods put up in the way de-
scribed.-C. E. O. It may be that your magnet sufficiently powerful. It should hold about 1 is no iron. Use finer magnet wirè, and wind it directly on the magnet wrapped with one layer of writing paper See answers 19, 15, and 22 , p. 155, Scientipic American
of March 9,1878 .-C. W. B. It will be necessary send sample of the water containing the animals re ferred to before we can answer you.-J. C. H.-There
are a number of devices of the kind referred to in your are a number of devices of the kind referred to in your
letter. You can probably obtainaddresses by inserting (1) E. W. asks: 1. What is meerschaum . Meerschaum (sepiolite) is a hydrous silicate of mag nesia-silica $60 \cdot 8$, magnesia $27 \cdot 1$, water $12 \cdot 1-100$. 2 Where does it come from? A. It is found in Spain and
several countries at the head of the Mediterranean.
(2) C. E. L. writes: I notice in the ScIENTIFIC Ambrican of April 6, 1878, p. 209, an account of the performance of certain telephone circuits not connected in any way with the wires over which the con-
cert music was being transmitted. There was one in cident that the papers had no account of, that took Morse in the wire of Dr. Speare, which is worked with 15 feet to the Western Union wires. He received the whole concert on an ordinary Morse sounder by placing a cylinder of cardboard over one of the coils, upon Doctor says he is frequently able to hear the Morse work from the Western Union wires in the same
(3) J. F. M. writes: The water at this place contains a large amount of lime. How can I prevent scale forming in the boiler? A. You should use a
feed water heater with sediment collector, and frequently blow off.
(4) F. M. C. asks: What will take the scale out of a steam boiler? The one I refer to is an upright ture of the scale, it is impossible to recommend any specific remedy. By allowing the water in the boiler to become cool, after the fire has been hauled, and then letting it out, the scale is frequently
that it can be brushed or washed off.
(5) M. E. J. asks: What effort; in foot lbs., does it require to draw a 14 inch plow, cutting 6 inches deep, through ordinary ground? A. For any spe.
case, this could only be determined by experiment. What will make a cheap black paint to dip harrow
teeth in? A. We think tar thinned with turpentine would teeth in? A. We thi
answer very well.
What book will assist me in making drawings of models? A. Professor Warren's works are highly
spoken of. See also the series of articles by Professo MacCord in the Scientific American Supplement. (6) H. K. writes: 1. In Barnes’ "History of the United States," at the close of the description
of the Atlantic cable, it is said that a message had been ent by a battery made of a percussion cap. Please explain. A. We believe the cap was filled with aciduthus forming a battery, in which the positive pole was the copper gun cap, and the shred of zinc was the neg-
ative pole. 2. Is moist earth a better conductor of electricity than water? A. That will depend on the kind of earth. 3. How is the Trouvé moist battery con structed? A.
1877, p. 323.
(7) G. H. O. writes: I am making an electric machine, and a short time ago purchased a sheet of vul canized rubber about $1 / 4$ inch thick and 15 inches in di-
ameter for the plate. This was cut round, and promised to do well. But it has commenced to curl up, and Icannot straighten it out. What is the cause of this,
and is there any remedy forit? A. It may be that the rubber plate is not hard enough, or that it has been exposed to unaue heat, and sagged out of form by its own
weight; however, you can straighten it again by placing it on a flat sheet of metal, held on the surface of boil ing water. The rubber plate will become softened by the heat of the boilng water, and when it lies flat on
the metar plate, the latter should be removed from the surface of the water and allowed to cool slowly, with he rubber plate on it.
(8) E. F. G. writes: In the Scientifio American of April 6, 187\%. p. 214, under the caption it is statea that some theorists have put forward the dea that the steam had turned to gas. Can that be possible? A. Yes; by decomposition of the steam into its elements, hydrogen and oxygen, by chemical or
electrical means. The statement in the case referred to, however, was mentioned as an absurdity.
(9) J. C. asks: What is the simplest method melting brass for small castings? A. In a plumbago
(10) E. W M ask:

10. W. Way to apply diamond powder to the edge of a soft iron lap?
The lap is to be used in cutting glass. A. Witha brush nd olive oil.
(11) S. S. C. asks: Is any greater injury done to the bottoms of boilers, and also to grate bars,
by the use of coke as fuel than by the use of coal? A. Generally, no.
(12) J. H. A. asks: Will not a given mount of water (say 36 cubic inches) raise more water to a given height (say 40 feet) if applied on a breast
bucket wheel 10 feet diameter under an 8 foot head, driving a force pump, than it would if applied to a hydraulic ram? A. The wheel will probably give as much as wice the effliciency of the ram. 2. Is not a suction and forcepump better (for thathetght) than a force pump alone? A. We doubt whether one has any especial advantage over theother. 8. Boes it require more power to force a stream of water, say $3 / 4$ inch, through a large
pipe, say 12 inches in diameter, than through a $3 / 4$ inch pipe, say 12 inches in diameter
pipe? A. Quite the contrary.
(13) A. J. B. writes; I have a small horizontal engine with cylinder $3 \times 6$ inches, running at 300 volutions per minute, mounted on a horizontal boiler the locomotive pattern, 16 inches in diameter by 4 feet long, with 11 2-inch tubes. 1. Is the boiler of suf-
ficient capacity for the engine? A. We think so. 2. What shall I use to feed the boiler, an injector or a ump? A. An injector will answer very well. 3.What naterial is best for paintingtbe engine? A. Black varish made from petroleum can be used. 4. Wil at troke, give fully 2 horse power? A. It probably will In reference to other inquiries address the manufac-
(14) G. W. H. asks: If a ball were dropped rom the surface toward the center of the earth, through a hole passing through the earth, would it pass beyond
the center or stop when it reached its center? A. It would pass beyond, and return.
(15) J. W. A. asks: How many lbs. can a good engine raise 1 foot from the ground if fed with 1
bushel of coal? What is the amount of power stored bushel of coal? What is the amount of power stored up in that quantity of coalp A. Good engines require
from $21 / 2$ to 3 los. of coal for each horse power develfrom $21 / 2$ to 3 lbs. of coal for each horse power devel-
oped per hour, or perform $1,980,000$ foot lbs. of work, oped per hour, or perform 1,980,
It is said thatthe temperature of an Esquimaux snow It is said thatthe temperature of an Esquimaux snow
hut is sometimes raised to $90^{\circ}$ Fah., partly by the heat from the bodies of its inmates, and par's by two or three lamps burning. If so, why does the hut not melt
down? A. The statement can scarcely refer to the alls of the hut.
(16) T. W. G. writes. I am making a colection of coins, and would tike a recipe for keeping
hem bright when exposed to the air. A. Thinned them bright when exposed to the air. A. Thinned pale animé varnish is often used; dry and warm the
coin and dip quickly. Photographers' unsensitized colcoin and dip quickly. Photographers' unsensitized col(17) S. W. writes: I have read of a plan of felling trees by cutting through them with a platinum wire heated red hot by a battery. Please inform me
further. A. The battery must be of sufficient power to further. A. The battery must be of sufficient power to
readily heat the platinum wire to a very bright rea heat; readily heat the platinum wire to a very bright red heat;
if the platinum wire is thin, less battery power is reif the platinum wire is thin, less battery power is re-
quired to do the same work, but the thin wire, when quired to do the same wo
heated, is easily broken.
What is the best brain food? A. That which is fou
(18) J. W. P. asks: What is the system of aying out a steam cylinder? I would like to know how pend on the pressure of steam and piston speed. Thus, calling A the area of the piston in square inches, $P$ the mean pressure in the cylinder in lbs. per squ
inch, and S the piston speed in feet per minute,

Horse power $=-\underset{33,000}{ }$
From this equation the proportions of cylinder for a (19) C. S. asks: Will you please define in plain language precisely what is the meaning of the
phrase, "limit of elasticity" or "elastic limit " so frequently used in discussions on the strength and qualieans the tensile force, in lbs per square inch, that a material can bear without rece. per square inch, that a
(20) A. G. C. asks: What substance is used ith plumbago for coating the hulls of yachts, and what is the mode of applying? I do not mean a tem-
porary coat +0 last just for a race, buta permanent coating. A. We are not aware of any mode of applying a permanent plumbago coating. It is usually put on with tallow, and only intended for special work.
Whatbook gives information on rigging boats, names of ropes, in fact general information on the subject?
A. Consult Luce's or Alston's " Seamanship."
(21) A. L. H. asks: Are locomotive engineers obliged to have papers? A. The regulations in re-
gard to this matter vary on aifferent roads, and you should make inquiries of the offlcials. We believe there
(22) E. B. J. writes: I have tried plaster moalds to run metal to make a medal. It does not produce sharp impressions. How can I make a copper (23) G. D. M. writes: Please advise me as to the best pipe for conveying water to house from well 250 feet distant. We laid new iron pipe 1 inch in diameter last July, and have never yet been abie to use whe water owing to flakes of rust and fine particles
which appear in the water no matter how long it is allowed to run. The pipe is not exposed to the air, but in the well is covered with rust a quarter of an inch in thickness. The stones of the well near the surface of
the water are also covered with a yellowish rusty look. ing slime. A. Use lead pipe lined with tin.
(24) J. F. asks: If I condense ten volumes of atmospheric air into one volume, and cool it, say, to
$40{ }^{\circ}$, then allow it to suddenly expand to the original ten volumes, what will be its temperature? A. The fol lowing formulx are applicable to such cases, provided there is no loss of heat oy raciation or conduction: $\mathrm{T}=$ absolute temperature of air before compression; $t$
$=$ absolute temperature of air after compression; $\mathrm{V}=$ $=$ absolute temperature of air after compression; $\mathrm{V}=$
volume of air before compression; $v=$ volume of air Volume of air before compression; $v=$ volume of air
after compression; $\mathrm{P}=$ =pressure of air before compres $\stackrel{t}{\mathrm{~T}}\left(\frac{\mathrm{~V}}{v}\right)^{0.408}=\left(\frac{p}{\mathrm{P}}\right)^{0.29}$
(25) E. M. F. writes: I wish to have some metallic cylinders cast, about 10 inches long. $21 / 2$ inches in diameter, and $\frac{1}{1} \overline{6}$ inch thick. Lead is too soft. What trong? A. Soft or yellow brass, or solid drawn brass tubing, might answer.
Minerals, etc.-Specimens have been re ceived from the following correspondents, and examined, with the results stated: A. T. B.-Principally a ferruginous clay. May be It is a bituminous shale or clay calcined. -T.J. H.mall quantity of oil illuminating gas by destructive smali quantity
distillation.

## COMMUNICATIONS RECEIVED.

The Editor of the Scientific Anerican acknowledges with much pleasure the receipt of origin
contributions on the following subjects:
Locomotive Strokes. By W. G. Protection against Torpedoes. By F. P. Is the Nation Safe from Invasion? By C. S. The Weather and Rheumatism. By J. H.
Treatment of "Rusty" Gold. By J.T. Treatment of "Rusty" Gold.
Claude Bernard. By H. M. D.
Claude Bernard. By H. M.
Galvanic Action. ByC. P.
officlal.
INDEX OF INVENTIONS
Letters Patent of the United States were Granted in the Weok Ending March 19, 1878 , AND EACH BEARING THAT DATE. [Those marked (r) are reissued patents.] A complete copy of any patent in the annexed list, including both the specifications and drawings, will be
furnished from this office for one dollar. In ordering, please state the number and date of the patent desired and remit to Munn \& Co., 37 Park Row, New York city.

## Alloy, bronze, E C. Kirk Amalgamator, L. M. Board

nimal trap, J. McMahel
Axle box, . . B. Bason ...
Axle box, J. A. P. Vanclain
Axa mox, Jine, G. O. Lackey ...........
Bale band tightener, Sevey \& Man
Bale band tightener, Seve
Bale tie, F.M. Logue.....
Bedstead fastening, C. H. Goebel Bedstead, wardrobe, W. Fay............
Bevel, square, and level, W. P. Walte Billiard cusbion, H. W. Collender (r). Bit brace, C. H. Amidon . Blanks, receiving and arranging, H. W. W. Basset Blasting powder, Graham \& Ward.
Blind, outside window, J. Hester.. Blind stile mortising machine, Doane \& Bugbee
Boiler, sectional steam, J. w. Hard............... Boilers, removing sediment from, T. C. Purves Book binding. I. Reynolds Boot and shoe machine, N. J. Simonds. Boot legs, device forstretching, J. H. Walker. Brake, wagon, Keene $₫$ Van Order
Brick machine, J. A. Gamewell. Brick machine, J. A. Gamewell.
Brick machine, P. H. Kells (r).. Bridle bit, J. Stanley .......
Broom brace, C. H. Butler Bung.and bush, J. Blair
Burglar alarm, A. Beck Button hole cutter, A. J. Lytle.
Button, lacing, G. W. Prentice. Cake holder and cooler, S. W. . Larrabee
Can, metallic, Green \& Wilson, Jr. (r)... Can spout, A. L. Fisher Car, railway, J. C. Paul
Cars, draw bar for railway, G. F. F. Godley Carriage, child's, J. A. S. Simonson
Chimney cap, J. W. Taylor
Churn, o. o. Moore
Corn sheller, Scharnweber \& Barkham Cornices.mould for running plaster, J. $\dddot{\text { Y. Brickey }}$ Corset, I. W. Birdseye
 Cut off, self-adjusting, W. Lowe.. ylinder with steam jackets, Leavitt,J............ 21 Diagrams, transmitting, J. M. Wolbrecht Digging machine, J. Coast ..
Ditchng machine, J. F. Wat Dough mixer, J. M. Stanyan. Drill, grain, J. R. Finch . Drill grinder, A. $\mathbf{K}$. Rider Drilling, etc, subt, C. F. Jacobson Drilling, etc., subaqueous, J. H. Striedinger et al Egg carrier, P. Schulze .... Egg carrier, J. L. Steven Egg cup, W . Starkey .. Electrical currents, C. H. Wilson Elevatorfeeder, R. Marquis ... .........

Engine, rotary, L. Van Doren....
Engine, rotary steam, Engine, rotary steam, A. Siegrist
Engine, wind, Croft, Sr., \& Croft, Jr Faucet, lock, F. C. Lillis
Faucet, measuring, Johnson \& Everts. Fence post, B. C. Johnson
Fence post, D. K. Mabie ............ Fence wire, barbed, T. H. Dodge . Filter, G. H. Moore .
Filtration, C. Gerson......
Fire arm, Henry \& Fraser.
Fire escape, J. Stengel.
Fish and animaltrap, G. Davis Flanging machine, Campbell \& Richards our and meal chest, sifting, C. Romine Flue, H. R. Bash.
Flume, R. H. Campbell........ Funnel, D. Williams
Furnace, gas, N. Will
Game apparatus, C. Eusten.......
Garment supporter, T. J. Carroll Gas apparatus, C. Holland. Grain binder, A. S. Hoyt
Grapple, A. L. Larwill Grate for fire places, J. Moore, Jr Harrow, J. K. Miller
Harrow, J. W. Pearson
Harrow, Smith \& McCulley Harvester, G. H. Spaulding Harvester, C. Wheeler, Jr.
Harvester, cotton, 1. Boone
Harvester, cotton, Hrims, machine for curling, T. Lees Hat and cap, sweat leather, W.J. Van Horne. Hatchway, L. Pare.
Haversack, J. H. Lambert
Hinge, lock, P. Adams, J
Hoe, W. H. Eggleston
Hog dresslng machine, I. Boone
Horses, toe weight for, C. Ferrier
Horseshoes, W. Dickinson
Hot air apparatus, E. Moreau
Hub boring machine,
Hub, W. H. Wright.
Irrigating apparatus, ©. D. Page
Ivory imitation, J. W.
Jewelers' soldering tweezers, C. F. George.
Key fastener, J. T. White....... ..........
Knitting machine, A
Lamp, F. B. Squire
Lamp extinguisher, A. Hall
Lamp extinguisher. L . Hall . . . . .
Lamp, shoemaker's, A. Rose
Latch, reversible, I. E. Van Benthuysen
Lewises, Graham \& Dennison.
Lifting jack, Tichenor \& Dexter...
Lifting jack, etc., A. W. Comstock
Lighting device, W. W. Batchelder
Lock, bag, A. Oberndorfer.
Lock, time, P. F. King.
Lock, trunk, striker for spring, W. H. Taylor
Lubricator, loose pulley, w. G. Beach.
Lubricator, G. W. Farnham..
Lumber, drying, G. Woods (r)..........................
Lumber, running through flumes, N.P.Chipma
Machinery, driving light, M. Everhart.
Manhole and cover, T. Kerr...
Marble, artificial, J. J. William
Marble, artifcial, J. J. Williams..
Meats, powder for curing, E. Gorges...............
Metals, expanding and contracting, G. W. Ford.
Mill for pulverizing, J. W. Hyatt.....
Mirror and other fra
Mirrors, T . Carney.
Moulding in sand, Aiken \& Drummond.............................
Motor, water. W. F. Eyster
Motor, water, G W. Stith.
Motor, weight, A. Barker
Mower, R. Eickemeyer ...
Mud pipe cleaner, H. Green
Musical instrument, valve action, T. Artaud
Nails, picture, W. E. Jones .
Neek tie retainer, $\mathbf{O}$. P. Hurd..
Numbering machine, C. Ewing.
Oil cup, A. S. Smith... ........
Oiling wheel axles, H. D.
Painting machine, C. T. Brandon on........
Paper pulp machine, Baxendale \& Barr
Paper pulp machine, Baxendale \&
Paper pulp machine, J. G. Moore...
Pianoforte action, F. St.
Pin, dowel, B. F. Allen
Planing machine, J. B. Sto
Plant duster, J. O'Brien.
Planter attachment, Armsworth \& Brown..
Planter, C. Berryman..
Planter, o. C Green ...
Planter, O. B. Seamans et al...
Planter, P. B. Doty...
Plow, L. Eberle, Sr., et al.
Plow, J. Pollock.......
Plow, T. I. Wade.
Plow, C. A. Weed
Plow cutter, Wansbrough \& Speer Press, cotton and hay, G. w. Soule........
Press, hay and cotton, P. K. Dederick (r). Printing machine, G. Rosquist. Printing, transfer sheets for, ,.. T.
Pulping macbine, F. A. Cushman Pulping macbine, F. A. Cushman ........ Pump and condenser.
Pump, ship's. J. Edson ..............
Railway, street, J. R. Beckett (r)
Rake, hand, J. Benedict..
Range, J. Briggs.
Sampling glass, molasses, W. M. Ric Sash fastener, J. G. Beecher.
Sash holder, G. W. Graffin, Jr Saw guide, F. Clark.
Saw mill head block, W. H. Abrams..
Saw set, G. W. Atkins.
Saws, fastening the ends of band, o. Prat
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