

Inventions Patented in England by Americans. From March 31 to April 9, 1877, inclusive.
Boot Making Machinery.-S. Henshall, Philadelphia, Pa.
Controlung Cranes, etc.-T. A. Weston, Stamford, Conn Controling cranes, ETc.-T. A. Weston, Stamford, Conn.
ExERCISING Apparatus.-G. W. Wood, New York city. Exiadst NozzLe.-T. Shaw. Philadelphia, Pa.
Flange Machine.-C. Miller et al., Pittsburgh, Lamp Globe, etc.-Meriden Glass Company, Meriden, Conn. Mower.-J. R. Parsons. Hoosick Falls, N. T. Recovering tin from Scrap. - N. S. Keith, Brooklyn, N. Y
Refining Sugar.-F. O. Matthiessen, Irvington, N. Y. REFINNG SUGAR.-F.O. Mirks, Chester, Pa.
Roving TWISTER.-J.
SCRAP BOOK, ETC.-B. J. Beck, Brooklyn, N. Y. SCRAP Book, ETC.-B. J. Beck, Brooklyn, N. Y
SBetcie.-D. H. Chamberlain, Boston, Mass. Time Globe.--L. P. Jewet, Glen's Falls, N. Y. Trimming boot Heers.-J. H. Busell, Boston, Mass.
Trunk, efc.-W. S. Soule et ai., Mass.

## 

## NEW HOUSEHOLD INVENTIONS.

IMPROVED COFFEE POT.
Richard L. Nelson, Orange Court House, Va.-This invention is an improvement upon that for which letters patent have been lately granted to same party. The objects aimed at in the present improvement are to ren-
der the former "drip attachment " more compact, to lessen the number of parts composing it, to reduce the cost of the same, and to lessen the time required for making cofee.
improved scrudbing machine.
Peter Byrne, Jr., Norwalk, Wis.-This machine consists of a wheeled frame, carrying a reciprocating scrubber and mechanism for operating it;
also a water holder, which is connected with the scrubber by a flexible tube, and a mop and pan, for takingup the water that has been used in the scrubbing operation. The machine is pushed about on its wheels, so that scrubbing operation. The machine is pushed about on its wheels,
the fioor is both scrubbed and mopped as the machine advances.
improved mosquito net friame.
Johann F. Volle, Houston, Tex.-This invention consists mainly in ver tical posts or rods, swiveled to the head of a bedstead, and having horizon-
tal arms to which the net is attached by means of sliding rings. The invention further consists in connecting the said arms by a crossbar or rod which is adapted to slide thereon, and to which the net is likewise at-
tached in the same manner as to the swingingarms. The invention further tached in the same manner as to the swinging arms. The invention further
relates to the peculiar arrangement of cords for adjusting or operating the relates to the peculiar arrangement of cords for ad,
swiveled posts and extending or retracting the net.
mproved spring bed botton
William M. Edmans,Troy, N. Y.-This invention consists in wire springs, bent into forked or branched form, having their ends turned upward, to enter the lower side of the end rails of the bed bottom. The upper outer corners of the end rails are rounded off, and the springs are curved inward
above them. The ends of the springs are bent upward at right angles, to above them. The ends of the spring slats.
enter holes in the sprin
improved lamp shade holder.
Hiram L. Ives, Troy, N. Y., assignor to himself and T. Henry Dutcher, of same place.-This is an improved illuminating shade holder for lamps,
by which different sized shades may be used, and a more perfect combusby which different sized shades may be used, and a more perfect combus-
tion and brighter light without the use of a chimney produced. The holder is made of inverted conical shape and oftransparent glass, the angle of the sides being so arranged that the rays of light are reflected from the shade at the opposite side of the holder. The upper circumference of the shade holder is provided with two fianges, of which the inner flange is supported on an inclined collar, and slightly below the level of the outer flange, so that a shade seated on the inner fiange will almost touch the outer flange
and form a neater finish therewith.
improved knife-scouring pan
David H. Cassel and George W. Zint, Crestline, O.-This is an improved pan for the convenient scouring of knives and forks; and it consists of a sheet metal dish or pan with inclined center plane or rest piece for the
knives and forks, and a front partition, providing a receptacle for the scourknives and forks, and a front partition, providing a receptacle for the scour-
ing powder. The scouring powder is taken up and applied directly to the ing powder. The scouring powder is taken up and applied directly to the
knife or fork, bringing always a fresh quantity in contact with the same as the spent powder is dropped from the rest piece into the spaces at both sides of the same. The inventor claims that the scouring of knives and forks is by this pan accomplished in a neater and more convenient manner the pan forming a clean and readily available device for that purpose.

IMPROVED BUTTER DISH.
William H. Fitch, Brooklyn, N. Y.-This butter dish or plate is stamped up of a sheet-metal blank in the customary manner. The sides of the dish are made straight with outward inclination, and connected at the corners
by outwardly projecting mouldings, which are thrown beyond the outside edge of the dish by narrow tapering sections, that extend at right angles,
or nearly so, from the sides. This outwardly projecting section serves not or nearly so, from the sides. This outwardly projecting section serves not
only to stiffen the sides, but mainly for the purpose of providing for the only to stiffen the sides, but mainly for the purpose of providing for the
surplusstock at the corners, and avoiding the creasing or wrinkling of the sides by the tool arge quantity of stock at the rounded off corners. The uiring less power in stamping the dishes, so that two or more may be stamped up by the same blow, and of producing a smooth, stiff, and durable dish of uniform appearance, and without the objectionable folds
creases that are generally found in sheet-metal dishes of this kind. improved provision safe.
Ezra Webb, Brooklyn, N. Y., assignor to Mrs. S. E. Shutter, New York city.-This invention is intended to be placed in a window when there may be a scarcity of closet-room, to receive cooked and uncooked provisions,
and to be so constructed that it may serve also as a refrigerator. A safe and to be so constructed that it may serve also as a refrigerator. A safe
has wire cloth in its front and back, so that the air may pass through it freely. The top of the safe is made inclined, so that the rain may run off it freely. The front of the safe may be provided with a single door or with
double doors, as may be desired. In the bottom is placed a pan in which may be placed a rack to receive ice, shelves being placed in the upper part
of the said compartment. The drip water from the ice chamber may be received in a pan or other receptacle, or may be conducted away by a pipe. IMPROVED WASHBOARD.
William Serriss, Sidney, $\mathbf{O}$., assignor to W. M. Serviss \& Co., of same the object being to provide a washboard that will not warp when subjected

## to the acti repaired. <br> NEW WOODWOREING AND HOUSE AND CARRIAGE <br> BUILDING INVENTIONS.

## improved felly.

William A. Wharton, Belle Centre, O., assignor to himself and H. E. Lambert, of same place.-In this invention, a section of felly, is made from malleable iron, or any other suitable metal, so as to present the same ex
terior form and appearance as the ordinary wooden felly; but from it peripheral or tire side it is chambered out to lighten and cheapen it. Hole are made in it to receive the spokes, and from one of its ends a dowel pro jects, and in the opposite end a hole is made to receive the dowel of the
adjoining felly section. These holes may be provided in both ends of the felly section, and a in or bolt used to connect the adjoining ends of the fellies, if desired. A block, having the same form as the transverse sec tion of the felly, provided with a central opening for receiving the dowel is placed between the ends of the felly sections when the wheel is made; and when the spokes become worn, so that when it becomes necessary to
contract the rim of the wheel, one or more of the said blocks may be recontract the rim of the wheel, one or more of the said blocks may be re
moved and the rim contracted, so as to force the spokes farther into the hub when the tire is shrunk on.
improved fastener for meeting-rails of sashes.
William T. Doremus, New York city.-This is an improved window sas stop, so constructed as to operate automatically to fasten the sashes whe they are closed, so that it is impossible to close the window and leave the they will not shake and rattle with the wind. The invention consists in plate having upwardly projecting inclined flanges and shoulders upon it plate having upwardly projecting inclined flanges and shoulders upon its
sides. The'stop is so formed that, when left free, its weight will cause its lower forward corner to project, so that when the upper sash is raised int place, or the lower sash is lowered into place in closing the window, the
corner of the stop will be over the top rail of the said lower sash, and the window will be securely fastened.

## NEW MISCELLANEOUS INVENTIONS

## improved coin tray

Albert A. Hyde, Wichita, Kan.-This is an improved tray for the use of bankers and others using large quantities of coin, to enable them to have the coin in a convenient shape, and to facilitate the removal of the
coin from the tray when desired. The sides of the tray are attached to coin from the tray when desired. The sides of the tray are attached to
the side edges of the bottom, the lower parts of which project below said the side edges of the bottom, the lower parts of which project below said
bottom to serve as feet, and are so formed as to give the bottom a slight forward inclination, to prevent the coin from falling out at the open rear side. The interior of the tray is divided into compartments by vertical partitions, which are attached to the bottom and the front. The partitions are so arranged that the compartments may correspond in width with the
diametcr of the coins to be placed in them. The bottom of the tray is gradudiametcr of the coins to be placed in them. The bottom of the tray is gradu-
ated or made of different thicknesses, so that each pile of coin, when made ated or made of different thicknesses, so that each pile of coin, when made
level with the top of the tray, may contain even dollars, and may thus prove the count or render the counting of the full piles unnecessary. A han ience in handling the tray. A lifter is used for removing the piles of coin from the compartments of the tray. The forward end of the lifter is concaved to rest against the side of a pile of coin, and to the lower edge of the forward end of said coin-lifter is attached a thin metal plate, to be slipped beneath a pile of co
once when desired.
improved station indicator.
John Peter Schmitz, San Francisco, Cal.-This apparatus is simple in construction, and operated by the driverof the street car, or brakesman of
the steam car, on which it is placed. Itindicates the streets or stations the steam car, on which it is placed. Itindicates the streets or stations
passed on the route by the names thereof appearingthrough a slot in the side of the case containing the endless traveling apron on which the names are printed. The apron passes around suitable rollers.
improved water elevator.
Abraham Vantrump, West Elkton, O.-The buckets on an endless chain empty into a trough above the platform, with exit-spout to keep upa steady
stream. By reversing the motion of the elevator, the buckets are emptied, which is of advantage in summer, as there is no water wasted, and the same is always obtained fresh and cool, while it prevents in the winter season the freezing of the contents of the buckets.

IMPROVED COTTON CHOPPER.
John P.Harrisson, Aberdecn,Miss.-This cotton chopper is so constructed as to chop the crop to a stand by being drawn across the field. The hoes may be ad justed wider a
stalks desired to be left.

IMPROVED LEVEL.
Thomas H. Burk, New York city-This invention admits of convenient observation from top and side during use; and it consists of a level and plumb having indicators, which are operated by a weight hung to the centor by bevel gear connection. A vertically supported shaft, that passes through the top dial, carries an index hand at the upper end, which hand is in line with the side indicators when they are in vertical position, stantly indicatemotions of the side hands in exact manner, so as to in joint working of the index hands facilitates the use of the implement, a the positions of the hands may be seen at a glance from the side or top
without necessitating stooping down to observe the side indicators.

IMPROVED HORSE COLLAR.
Hezekiah W. Whitney and Charles F. Whitney, Oswego, N. Y.-This horse collar is from parts of peculiar form, secured together by means of rivets and stitching, so as to form a durable and comfortable collar. The
face of the pad, or part of the collar that comes into contact with the horse's breast, is cut with a convex outer edge and a curved inner edge The ends of the face part are cut diagonally to fit the other portions of the collar to which it is attached. The threads of the stitching draw the inner
and outer surfaces of the collar together, forming one crease for receiving and outer surfaces of the collar together, forming one crease for receiving
the hames, and another for relieving the pressure on the breast of the horse and preventinggalling. A flat surface is formed for relieving the horse's breast from pressure. This surface is quilted to prevent it from becoming convex.

## NEW MECHANICAL AND ENGINEERING INVENTIONS.

## IMPROVED WINDMILL

Daniel ysewander, Springiield, 0 .-This invention consists in the comjustable weightwith the turn-table and the main vane; in the combination of the fiaring flanges with the edges of the wings of the wind wheel; in the wheel; and of the combers with the flanges and the wings of the wind wheel; and in the combination of upright bar, cross bar, hinge bar, and
the vane. It is too elaborate an invention to be adequately described with out engravings.

IMPROVED COTTON PRESS.
James Templeton, Florence, Ga.-The object of this invention is to
furnish a hand power cotton press of cheap, simple, and effective construc
tion, by which the packing and baling of cotton or other materiaì are fa
cilitated and accomplished with lessdanger from the fulcrumed lever. The invention consists of a lint box filled from the top, and is operated by a upwardly moving follower and sliding top panel. The base frame of the cotton press is supported on cross sills, and provided with uprights that are braced in suitable manner to the base sills, and s.rengthened by latera pieces, so as to form a strong and rigid support for the lint box. The lin box extends either through the floor of the building from the lint room down to the ground, or the same is provided, when the press is put up out-
side of the shed or building, with a platform around the lint box, at suitahe height above the base frame or sill.
improved machine for winding hay into rolls for fuEL.
Ebenezer Harding, Delavan, Minn.-This machine winds hay or straw into rolls or twists for the purpose of using the same in a compact and con enient form for fuel; and the invention consists of a flat revolving spinbeing wound upon the spindle, which is withdrawn when the roll is finished. After the hay is attached to the spindle by being wound once twice around the same, the spindle is revolved by one hand, and the roller pressed at the same time tightly, by the lever, with the other hand, agains the hay, so as to form a closely wound roll of hay or straw, of any desire size, around the spindle. When the hay has the requirad size, the spindl is withdrawn, by pulling the crank sidewise, and the roll removed. The urplus hay or straw is worked up quickly into rolls of compact ahap which may be used in convenient manner as fuel, in place of wood, and burned in any stove.

## NEW AGRICULTURAL INVENTIONS.

IMPROVED CORN PLANTER.
Harrison Wagoner, Coshocton, 0 .-This planter is so constructed as to open a channel to receive the seed, drop the seed at uniform distance apart, cover the seed, and mark the rows, so that the planting may be don in accurate check row. By this construction the dropping slides are draw back to drop the seed with a slow movement, and are pushed forward to
again receive seed with a quick movement, so as to jar the seed and insure the filling of their dropping holes.

IMPROVED PLOW
Robert B. Thomson, Dansville, Mich.-This plow consists of a combina ion of a mould-board, point, landside, forward standard, rear standard and beam. The standards are made with bends or offsets near their uppe of the forward standard has a forward projection or arm formed upon it through which passes the bolt that secures and pivots the beam to the sai standard. Upon the upper end of the rear standard is formed a projection or plate, which ismade in the form of a section of a circle. The forwar edge of the plate is concaved, and has a flange formed upon its lower sid to receive the hook of the hook boll. which passes up through the rear en of the beam, so that by loosening the nut of the bolt the rear end of th plow beam may be moved rom or to or leave land, as may be desired. The colter is entirely ind pendent of the beam, and may be ad justed up or down and toward or from the land, as may be desired. The handles are connected by rounds, the lower ends of which are secured to the landside and mouldboard by bolt, the upper bolts passing through slots, so that the rear ends of the handles
may be raised and lowered to corres pond with the height of the plowman. improved corn planter.
Charles L. Goethals, Los Angeles, Cal.-This machine is so constructe to open a furrow to receive the seed, drop the seed, and cover it. Th new feature consists in the lever which works the dropping slide.

## IMPROVFD DITCHING MACHINE

Thomas N. Turner and Santford Turner, Rushville, Ind.--The sides of theditch are cut by colters, the lower ends of which are attached to the forward corners of the share. The cutting edge of the share is made $V$ shaped, and its rear part is inclined upward, so as to deposit the dirt upon
the endless belt of the clevator. With this machine a slice about six inches deep may be taken from the bottom of the ditch at each passage, and by passing back and forth a sufficient number of times the ditch may be sunk to any desired depth.

IMPROVED CORN SHELLER
Herman Neubert, Ironton, O.-The forward part of the shaft is divide into four branches, to the outer ends of which is attached a ring plate
Upon the inner edge of the ring plate are formed four knives, the edges of Upon the inner edge of the ring plate are formed four knives, the edges
which are inclined, and which are bent into such a shape that their saic edges may rest upon the ear diagonally. To the branches of the shaft, a little distance from their ends, is attached a ring plate, upon the inne edge of which are formed lugs which are bent forward at right angles to extend along the ear longitudinally. A tube keeps the kernels from scat tering as they are removed from the cob by the knives and lugs.

## IMPROVED HAND CORN PLANTER.

William E. Seelye, Anoka, Minn.-The lower part of the front of the seed hamber is formed of a spring plate, which will spring inward to close th chamber when a plunger is raised, and is pushed outward to allow the seed
to drop into the ground when the said plunger is pushed down. The plunger is attached to the lower end of a bar, that slides up and down upon nected with the lower end of a handle which slides seed box, and is con of said back by two bolts. The bolts pass through a longitudinal slot, formed in the back of the planter and through a block or blocks placed in the said slot. The block or blocks keep the bar and handle at the prope distance apart, and also prevent the side edges of the bar from wearing the sides of the chamber.

IMPROVED CORN-GUARD FOR PLOWS
Edward B. Murphy and Charles D. Bramell, South Point, Mo.-This is an improved device for attachment to the beams of plows to prevent soil
and clods from being thrown against the young plants. It is a hollow cylindrical casting, made with its outer end closed, and upon the upper an lower sides of which are formed lugs to receive bolts which pass above an below the plow beam and through the ends of a bar placed upon the othe A spring holds the guard plate down to the ground and, at the same time allows it to rise to pass over an obstruction. The device may same time to the beam of a shovel plow, a turn plow, or any other desired kind of a plow.
improved corn planter.
H. William Meyerhoff, Waverly, Iowa.-This invention relates, first, to the means for changing the angle of the tongue to the frame of the planter,
for the purpose of varying the depth at which the furrow-openers deposit the seed in the ground; secondly, to the mechanism for reciprocating the seed slides, and the arrangement of a clutch for throwing the same into,
and out of gear with one of the transporting wheels; and, thirdly, to making the driver's seat ad justable by a particular construction.

IMPROVED PLOW.
Daniel P. Ferguson, Jonesborough, Ga.-This invention is an improve ment in the class of plows having pivoted adjustable standards, and it relates to the employment of a curved or angular notched brace for the plow
standard, and a weighted key for confining the brace. The invention further relates to the provision of a slotted stay-piece for preventing the share or shovel turning on the bolt by which it is attached to the standard.

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tion, Bronchitis, Catarrh, Asthma, and all Throat and tion, Bronchitis, Catarrh, Asthma, and all Throat and
Lung affections, also a positive and radical cure for Nervthoroughly tested its wonderfnl curative powers in
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It has been our custom for thirty years past to devo correspondents; so useful have these labors proved that the Scientific Ambrican office has become the factotum, or headquarters, to which everybody sends, who wants special information upon any particular subject. So large
is the number of our correspondents, so wide the range is the number of our correspondents, so wide the range
of their inquiries, so desirous are we to meet their wants and supply correct information, that we are obliged experienced writers, who have the requisite knowled or access to the latest and best sources of information. For ezample, questions relating to steam engines, boilers, boats, locomotives, railways, etc., are considered and ability and extensive practical experience. Inquiries
anding able and prominentpractical electricians in this country Astronomical queries by a practical astronomer. Chemical inquiries by one of our most eminent and experienced professors of chemistry; and so on through all the varlous departments. In this way we are enable to answer the thousands of questions and furnish the large mass of information which these correspondence columns present. The large number of questions sent-
they pour in upon us from all parts of the world-renrom the mass those that he thinks most likely to be of general interest to the readers of the Scientiric Ameri-
CAn. These, with the replies, are printed; the remaincan. These, with the replies, are printed; the remain-
dinto the waste basket. Many of the rejected questions are of a primitive or personal nature, which shoulcl be answered by mail; in fact, hundreds of cor-
respondents desire a special reply by post, but very few respondents desire a special reply by post, but very few
of them are thoughtful enough to inclose so much as a postage stamp. We could in many cases send a brief reply by mail if the writer were to inclose a small fee, a
dollar or more, according to the nature or importance of dollar or more, according to the nature or importance of
the case. When we cannot furnish the information, the money is promptly returned to the sender.
A. B. W. should put his questions as to saw and shingle machines into comprehensible language.-
T. J. P. will find directions for setting a boiler on p. 339 , vol. 33.-J. G. E. and many others are informed that there is no formula for the horse power of a boiler.-E.
L. N. will find directions for the decalcomanie process on p. 275, vol. 34.-O. C. S. cangild the devices on china
ware. See p. 43 , vol. $29 .-$ R. T. C. des not ware. See p. 43, vol. 29.-R. T. C. does not give suffi-
cient data as to the wire becoming brittle by exposure to the atmosphere.-T. W. will find directions for making oxygen on p. 75, vol. 32.-A. H. (of Niedergrund,
Bohemia) can cut gas retort carbon with a hand saw.L. F. C. should give his tinplate a coat of oil paint, and let it dry. He can then fasten cloth to it with waterproof glue; see p. 43, vol. 32. For a aescription of
compound engine, see p. 243, vol. 32 .-D. McI. will find on p. 218, vol. 34, directions for making the so-called gertised in our colurpents. Asbestos is regularly an vertised in our columns.--W. G. W. will
for nickel plating on p. 235, vol. 33.-J. O. F. will find instructions for making friction matches on p. 75, vol.
29.-C. W. will find a recipe for a cement for mending crockery and glass on p. 379, vol. 32. For mending leather shoes, see p. 119, vol. 28; for mending rubber
boots, see p. 203, vol. $30-$ H. C. B. is informed that tat tooed marks on the arms are done with gunpowder or Indian ink. For removing the marks, follow the direcny good cheese, that is soft, will do to make cement. S. will find that the cement described on p. 80, vol. 31,
docanot dissolve in water and does not become brittle docs not dissolve in water and does not become brittle
with age.-J. M. McG.,Jr., should read Paddlefast's
 described on p. 119, vol. 28.J. W. S. can sensitize a piece of paper or metal by the process described onp. 132,
vol. 35. As to changes of color by heat, seep. 201, vol. 36. As to a weather glass, see pp. 35, 67 , vol. 36 .-P loes not give sufficient data as to the hammering in his
boiler.-W. C. P. is informed that the premation is boiler.-W. C. P. is informed that the preparation is to
lee taken internally. The human hair is referred to in the question.-T S. will find directions for fastening the question.-T. S. will ind directions for fastening
rubber to iron on p. 409, vol. 33.-S. R. C. will find a description of a gyroscope on p. 91, vol. 31.-T. K. \& B.
should know better than to believe in the possibility of a instrument indicating where gold lies buried in the arth.-C. W. K. is mistaken as to the horse power of the engine. See p. 33, vol. 33.-W. T. K. can bleach
ivory by the process described on p. 10, vol. 32 , -W. S. vory by the process described on p. 10, vol. $32 .-$.
will find answers to all his queries as to lightning rods on p. 277, vol. 35.-H. R. will find directions for silverplating without a battery on p. 299, vol. 31--R. M. will find a formula for the power of an engine on
p. 33 , vol.33.-A. I. willfind on p. 123, vol. 31, directions for bluing gun barrels.-W. A. W. will find somethin on the expansion of mercury by heat on p. 354, vol. 26 .
-O. B., A. G., A. J. B.,J. C., R. D. E., F.J. W., N. B., A. P. Q., F., J. N., R.B., C. W., F.C., W. L. McL., to recommend books on industrial and scientific sub-
jects, should address the booksellers who adverti in our columns, all of whom are trustworthy firms, fo
(1) W. W. H. asks: Piease tellme the ultimate weight that the two following girders will bear
One is a cast iron girder, nearly of the Hodgkinson pro portions, 7 inches wide at base and $81 / 4$ inches high; and nches $x 3 / 4$ inch. Both girders being fixed and an chored in strong walls, and the span 20 feet. Please
give an arithmetical and not an algebraic calculation. . Calculated by the usual formulas, the center break wrought iron beam, about $2,300 \mathrm{lbs}$.
(2) F. A. B. asks: What is the weight of missile, and the greatest distance that the bolt could d thrown by the large Krupp gun, that was on exhibition
at the Centennial? A. Weight of ball, $1,2001 \mathrm{lbs}$. Probable range, between 4 and 5 miles.
(3) F. B. asks: 1. As a boy swings a bucket of water over his head and it does not fall out, how
fast would a 10 foot flywheel with glooular cavities on inside rim facing center of wheel have to turn to hold balls of any substance dropped or placed in them
Would there be a different effect if the balls were com posed of different materials, as wood, stone, or iron?
A. About25 revolutions a minute, whatever the mate A. About25 revolutions a minute, whatever the mate-
rial. 2 . On the principle of a top, a heavy wheel can be rial. 2. On the principle of a top, a heavy wheel can be
turned readily after starting. What difference will it make if, instead or a wheel, it should be as a large gov-
ernor with heavy balls on arms 8 or 10 feet long, and ernor with heavy balls on arms 8 or 10 feet long, and
how much more power would have to be expended to raise those bails on a spiral incline to near the level of heir attachments? A. The height of the balls varies
as the square ofthe revolutions. 3. Suppose a perpendicular shaft, moved by cog or belt gearings, had four or more balls suspended by chains instead of stiff arms, would they not assume a similar position? A. Yes, other things being the same. 4. Suppose a tube ar-
ranged to turn and describe a circle, with outer cnd ranged to turn and describe a circle, with outer cnc
closed, but with an opening below, no wider than the cross section of tube, but giving perpendicular surface enough for a ball to rest against, if the ball could be held there by springs or ctherwise until great velocity was acquired and then released, would it not remain
there? A. Yes, as we understand your meaning. 5. have seen a performer manipulating a top which at one from the perpendicular stick that supported it. What held it up? A. Centrifugal force, which was enough to overcome the attraction of gravitation. 6. Does such a top weigh any less acting in that position than when at rest? A. No
(4) H. T. P. asks: Which has the most steam-generating capacity, and which is capable of the greatest resistance, a single boiler 60 inches in di-
ameter and 18 feet long, or two boilers each 36 inches in diameter and 18 feet long? A. Generally, the two the greatest pressure.
(5) A. S. D. says: I have a canal about two miles long, which I use as a hear race for water powe dirt into it. How can I clean it out without drawing off

> reagign machine.
(6) W. O. R. asks: What is meant by the hitch of a steamer's propeller being 3 feet? A. It means screw in a nut, the vessel would advance 3 feet at each
(7) J. A. O. Q. asks: Does not the Great Eastern consist of three complete ships? A. Nc; but
the vessel is built with a a double hull, and is divided by balkheads into several compar
(8) W. D. S. says: Three men want to carry a bar of iron 9 feet long, weighing 300 lbs . One man carries an end. At what distance must the other two
place a bar so that an equal weight (or 100 lbs.) will fall on each man? A. Three feet from the other end of the
bar, if it is uniform in section.
(9) J. T. H. asks: Is tallow a good lubricant for cranks making 200 revolutions? Would oil be better? A. Oilis generally better than tallow for crank pins, and there are some special forms of lubricants that answer very wel
a high velocity.
In anengine (double and vertical) $9 \times 12$ inches, mak by 14 inches face and 3 inches thick, would there be any danger of breaking the wheel by placing a weight sufficient to balance weight of pistons? A. We think there
will be no danger in attaching the counterbalance.
(10) W. M. K. says: What is the rate of increase of friction in proportion to speed of a thin smooth body (such as a propeller blade) in passing
through water? What proportionate amount of power would berequired to double any given number of revointions of a fixed proximately as the cube of the number of revolutions, but the exact law of the variation is not definitely settled; and when the speed becomes very great, the power but experiments have not been sufficiently extended to stablish a general law.
(11) G. B. says: Two bodies of metal of equal weight are to slide over a planed surface. One of
these bodies has a bearing surface (supposed to be a perfect friction contact), upon the table it slides on, square feet; the other body has a bearing surface only 6 square inches. Will it require more power
slide the body having 6 square feet bearing thanit wil to slide the one having only 6 inches, or will the re-
quired moving power be equal? A. According to the commonly accepted law, the friction depends upon the weight and not upon the area of contact. This rule, however, has some limitations, especially when the area
of contact is so small that the pressure per square inch brasion
(12) H. D. M. asks: Is the phosphorus lamp described on p. 266, vol. 31, of any use? A. The phos-
phoruslamp may be made and used as directed in the
answer but the light which it emits is extremels weak -a mere phosphorescent glow. It is sufficient, however, in a damp atmosphere, to illuminate the dial of a
watch, held close to it, so that with ordinary evesight watch, held close to it, so that with ordinary eyesight
the time may be noted in the absence of other lumiants without much aifficulty
(13) S. asks: Is there anything that will erase Inaia ink lines from drawing paper? A. Nothing rubber.
(14) R. H. \& Co. say: 1. In our business upport brads with malleable cast iron heads, for the support of lightning rods, and we galvanize them to
prevent rusting. When we use them, we find the cast ron so brittle that a great many of them break. We ing makes them brittle. Are we right? A. Galvanizing
iron does not make it brittle. 2 . Is it necessary to throw
articles that are galvanized into cold water immediately articles that are galvanized into cold water immediately
after taking out of the vat? A. No. They should not be thrown into cold water
(15) B. F. A. asks: How can I stain wood blue, the shade of the field in the American flag? A. copper in are the gith of solution of carbonate of soda ( 2 ozs. to 1 pint water) 2. Boil 1 lb . indigo, 2 lbs . woad, and 3 ozs. alum in 1 (10) water, and apply with a brush.
(16) C. M. T. asks: What will make photograph paper so transparent that it can be painted in oil colors on the back of a picture, so as to givea life-like color to the picture, or what preparation will make the
paper perfectly transparent? A. Try Canada balsam. paper perfectly transparent? A. Try Canada balsam.
Paper cannot be made perfectly transparent-only transPaper ca
lucent.
(17) C. D. H. says: Our water supply is fromsprings, and is soft. Abouttwo years ago, plain iron
pipes were laid; and the 1 inch pipes have become so flled pipes were laid; and the 1 inch pipes have become so filled
with a very hard rust or scale as to nearly cut off the supply. It forms in irregular masses, and adheres very frmly to the pipe. Is there any known method of preventing or removing the same without taking up the pipe? A. We do not
accomplishing this.
(18) C. K. asks: Can a good polish be put on copper by the recipe given on p. 326, vol. 32 , and will
it last a reasonable time? recommended. It is better to use a larger proportion of (19) B. C. M. asks: How is pyroligneous acid (wood vinegar) made? A. It is obtained by distillingwood in iron retorts, resembling those used for makng illuminating gas. The condensed products of the crude pyroligneous acid or wond vinegar, amounting in a well conducted distillation to about 7 or 8 per cent of the wood employed. The gas that accompanies the liqui-
fable distillates is conducted to the furnace under fable distillates is conducted to the furnace under the retort, and serves to continue the distillation with-
out other fuel. In puritying the acid, it is first eatuout other fuel. In purifying the acid, it is first eatu-
rated with lime, evaporated to dryness, roasted at a rated with lime, evaporated to dryness, roasted at a
moderate temperature so as to free it from volatile matters, and decomposed in a retort, having a helm of
mer copper and a condenser of tin or silver, with hydrochloric acid ( 90 parts acid to 100 acetate of lime), and the acetic acid distilled.
(20) G. B. L. says: I built an oil house last fall, and lined it inside with inch boards, packing space between inside and outside boarding with pine sawdust. The oils on hand are coal oil, linseed, fish, elephant,
seal, etc., also turpentine and benzine. The leakage from barrels seems to have thoroughly saturated the floor, and most likely the sawdust has absorbed whal-
ever came in contact with it. Is there any danger of A. Yes, it is dangerous.
(21) A. H. says: Your correspondent, P., p. 212,vol. 36 , seems to overlook the fact that a lightning od having the deep earth terminal generally recom-
mended by scientific authority, and which he does not avor,would, at the same time, have all the advantages(?) of a rod terminating "at or just beneath" the surface,
such as I understand him to recommend. For, before reaching the deep terminal, the rod would come in contact with the surface of the earth; and if the electricity and there or elsewhere a better con stead of following the rod to the end. With a properly constructed rod, terminating with an extensive metal metal as the clip contact with such worthless scraps of or fine charcoal, or both, in constantly (not "almost always, during a thunderstorm") moist earth, which in lar bottom: there is little most easily found in the celtricity will leave the rod to "pass off on the wet sur-
(22) J. P. says, in reply to D. W.'s query as to the sudden weldiing of a millstone spindle to its
step: In theNew York Journal of Commerce, in the first year or two of its publication, may be found an account of a similaroccurrence. A spindle (I think it was of a millstone) was suddenly welded to the support upon which it was running, in the very same manner, as in
the case mentioned in yourpaper. I believe it occurred ine 1827 , or the first half of 1828 .
(23) W. D. says, in reply to D. W.'s query as to the welding of a millstone spindle to its step: I
have seen this done a good many times. To prevent it,
plane a groove inthestep harden thefoot of the spindle and step as hard as possible, polish both after hardening, and you will have no
trouble about welding together. The oil running through the groove prevents its welding. Use the best of sperm , and W W T
(24) W. W. T. says, in reply to the query about the welding of mill points to their steps: I have
had several such jobs to repair. The weld is perfect, and has always broken when struck in a different place from the point of union. I have to anneal the step and
turn off the part of point left; and I find no check or turn off the part of point left; and
ine mar':ing the place of contact.
(25) B. A. J. says, as to the sudden welding a mill spindle to its step: $I$ once had a spindle act in (26) W. C. says: Please give me a recipe or making powder for mining coal? A. Coarse-grained punpowder is usually employed. rectly dried and separately reduced to impalpable powfers. These are then sifted together, moistened with water, and ground for some time between large millstones kept constantly moist with water. The wet powder is then collected into large lumps and carefully dried. These lumps are grained by bringing them in contact with sharp teeth fixed upon the periphery of a
revolving wheel, and agitating in suitable sieves to seprevolving wheel, and agitating in suitable sieves to sep-
arate from the finer powder. The powder consists of 76 parts of niter, 13 parts of charcoal (often mised with a little wood pulp or sawdust), and 11 parts of sulphur.
(27) J. R. Y., Jr., asks: Please give me a recipe for a wash that will remove or hide marks and
stains on hard finished house walls. A. We do not stains on hard finished house walls. A. We do not
know of anything better than clean water to wash them. Sometimes $i$ is necessary to cover them with kalsomine. With bad stains over a large surface, it is best to take off the hard finish and renew it carefully in those places.
(28) C. D. R. asks: Please give me recipes for making turpentine japan or paint dryer, ben et makers' u il 1 gallon, put into it gum shellac 341 lb ., litharge and burnt Turkey umber each $1 / 2 \mathrm{lb}$., red lead $1 / 2 \mathrm{lb}$., sugaro ead 6 ozs. Boil in the oil until all are dissolved, which in 1 gallon spirits of turpentine. For benzine dryer take linseed oil 5 gallons, add red lead and litharge each $31 / 2 \mathrm{lbs}$., raw umber $11 / 4 \mathrm{lbs}$, sugar of lead and sulphate of zinc, each $1 / 2 \mathrm{lb}$. Pulverize, and boil in the oil as beore. When a little cooled, thin with benzine, 5 gallons. For rubbing varnish, use a solution of pure, bleached ton cloth, and a drop or two of oil
(29) J. H. R. asks: What is the advantage of placing the high pressure cylinder of a marine com A. All builders do not adopt this plan. Without being able to speak officially for those who do we imagine hat they consider the principal advantages to consist in economy of sprce and weight.
(30) W. K. D. says: I have an acquaintnce who has an open fireplace in his office, and claims
hat during the forenoon the sun comes into the room and deadens the fire. Is this true, and what is the cause? A. We do not believe it is true, but probably the effect of deadening
outshining the fire
(31) J. A. C. says: I have a boiler made of first class iron, which commenced leaking in one of the joints. This continued until every joint was leaking.
We then patched the seams, but in a short time the leaking commenced again. The water for our boilers was pumped from a welli into a tank, and was then warmed by having the exhaust pipe extend into it. Our boiler maker says that the leaking was caused by the oil which was carried from the cylinder by the exhaustpipe into the water in the tank and thence into the boilers. Ihis is not so, please give me the correctreason? A. form a decided opinion. The boiler makcrs ion points to a possible cause, while it is more likels hat the trouble is due to farlty construction, careles mangement, or to the se of bad wer.
(32) W. E. W. asks: 1. How can I tell he weight of a flywheel where I know the diameter number of cubic inches in the wheel by $0 \cdot 2604$, to get the approximate weight in lbs. 2. Is there a rule by which he weight of a wheel is regulated for any given hor power? A. No general rule for the size of flywhee ill answer under all circumstances. We could not trea the matter satisfactorily in these columns. You will
find a good discussion in Rankine's "Machincry and Millwork."
(33) J. E. C. says: I see it stated in an ar 331, that a belt wrapped one quarter round for 1876 p. 331, that a belt wrapped one quarter round a pulley
has only one fourth the power of what it would have i wrapped one half round. As an illustration of the abov is given a man with a rope taking turns round a post the number of turnsthe rope is taken around the post I have also known of pulleys being increased in diameer, so as to make the belt stick better and thereby hav riction increase But according to one of the laws friction. How do you account for the power gained in the above cases? A. This is notcontraryto the laws of ren in relation to bodies that are fexible. In these , ing that the friction depends on the angl ses on applied mechanics.
(34) M. A. W. asks: 1. Will a steam boil er 4 feet long by 24 inches diameter, with a firebox 40 one inch fues inehes wide, and a inches long, with 3 one inch flues, be large enough to run an engine with revolutions per minute? A. We think the boiler will answer. 2. Am I correct in estimating said engine at horse power? A. Actual power will not exceed 1 horse.
3. Would the above engine run a traction engine with . $\begin{aligned} & \text { dould the above engine run a traction engine with } \\ & \text { the }\end{aligned}$ feet in diameter, with gear wheel of 4 revolutions of the driver to one of the driven A. With good mabhinery you moderately good roads A. With good machinery you might obtain a speed of contained no novel features.
(35) C. A. C. asks: 1. How can I varnish a colored mechanical drawing, so that the paper and draw ing will not be marred by the operation? A. You must use
varnish specially prepared for the purpose, which you can probably obtainfrom some one who mounts show cards. 2 . What must the circumferential an fron disk (not serrated) to sever a bar of cold iron
(a) L. C.
(36) L. M. C. says: I am nineteen years of age, and my ambition is to learn to be a competent prac
tical locomotive engineer. What course would you ad vise me to pursue in order to obtain that end? A. Yo should try and get employment as a fireman on a loco motive. witle thure steam produce a higher note on whistle? A. Generally, yes. 2. Will compressed air produce the same note on a steam whistle as am does the pressure being alike in both cases? A. The sound is often clearer when air is used. 3. What is the bes way to stop foaming in a steam boiler? A. It is often ue to the construction of the boiler, or the arrangemen of the steam pipe. Sometimes it is caused by dirty
water or too strong a fire. The causes will doubtless suggest the remedies.
(37) J. O. says, in reply to D. W.'s query to the sudden welding of a mill spindle and its step piece: I have had a similar experience in the uniting of sence of lubricant. The foot friction, due to the ab unning at 180 revolutions a minute in a steel step and ransmitting some 25 or 30 horse power, brought a water wheel to a sudden stop. The uniting was preceded by a ine. Upon removing the shaft, a ridge of steel taken rom the step was found on the foot of the shaft; and no only be removed by a grindstone. Hardly and it could to be felt I believe the parts welded by wearing of parts to perfect surfaces, and then excessive friction completed the job.
(38) J. H. P. says, as to the welding of the spindle to the step plate: Ithink that the end of the pindle had worn a little hollow in the step plate, having the zame curvature with itself. The pressure of the air and oil, and the two had come into actual contact, (39) F. D. H. says: The statement of D.W stothe welding of a mill spindle point to its step can be verifed by three precisely similar cases, which have been brought to usfor repairs. He is undoubtedly in error in cagard to the point being well oiled. If that were the when running dry, such things occasionally happen. In every instance that has come under our notice the weld
was a perfect one, and defied all efforts to separate the was a a
pieces.
Minerals, etc.-Specimens háve been reeived from the following correspondents, and examined, with the result stated:
J. A. S.-It is iron pyrites or sulphide of iron. See p. , vol. 36.-W. R. S.-A quantitative analysis of fro material will be required. Send by express.-B. F. T.It is indurated clay, containing markasite. See p. 7 vol. 35. It is of little value.-H. A.
analyses cost from $\$ 10$ to $\$ 30$ each.

## COMMUNICATIONS RECEIVED.

 The Editor of the SCIENTIFTC American acknowledge contributions upon the following subjects:On the Valuation of Sugar. By S. W.
On the Involute of the Circle. By L. D'A.
On a Tidal Motor. By A. 8.
On City Travel. By T. B. McC.
On American Progress. By
lso inquiries and answers from the following F. B. M.-G. S. B.-P. P. P.-L. S. B.-A. K. B.

HINTS TO CORRESPONDENTS. the publise they may conclu that, for good reasons, the Editor declines them. Th Inquiries relating thould always be given. Inquiries relating to patents, or to the patentability inventions, assignments, etc., will not be publishe here. All succ questions, when initials only are given, our paper to print them all; but we generally take pleas ure in answering briefly by mail, if the writer's address Hundreds of inquiries analogous to the followin re sent: "Who makcs dynamometers? Where can ilkworms' eggs be obtained? Who makes brewer machinery? Who sells tobacco-flavoring , composi
tion? Who sells coffee-roasting machinery? All such personal inquiries are printed, as will be observed, in the column of "Business and Personal," which is spe ialy set apart for that purpose, subject to the charg ired information can in this way be expeditiously ob ained.

## official

INDEX OF INVENTIONS por which
Letters Patent of the United States
Granted in the Week Ending April 3, 1877
AND EACH BEARING THAT DATE.
[Those marked ( $r$ ) are reissued patents.]
A complete copy of any patent in the annexed list, ncluding both the specifications and drawings, will be urnished from this office for one dollar. In ordering nease state the number and date of the patent desire
gitating and mixing, G. L. Witsil.
gricultural boiler, McAfee \& True.
Animal poke, R. E. Atteberry.
Animal poke, B. D. Watson...
Arm rest, P. R Wagor.
Ax helve shield, J. M. I
Bag holder, J. Eberhard..........
Bail eye former, H. S. Reynolds
Bale tie, R. C. Pope.
Bales, tightening bands on, M. Quin
Barrels, trussing, P. Beamer..........
Bed bottom, spring, T. R. Jones....
Bee hive, H. Wheaton.
Beerke ge with soda, supplying, J. J. schill.......
Belts on pulleys, throwing elts on pulleys, throwing, R. Reinha
Bird cage, A. E. Mook..............
Blind slat worker, E. C. Whipple
Blind slat worker, E.
Bobbin, J. Mawson
oiler bottom, C. R. Everson...
Bolet heading machine, A. F. Jackison
Boot heel stiffener, Moore \& Rogers.
ooot heel stiffener, N. J. Simonds.....

Boot shank support, G. W. Wells...
Bootsand shoes, lacing, N. Evans. Boots and shoes, lacing, N. Evans.
Breech-loading firearm, I. M. Earle Brick machine. C. Schlickeysen. Briage, Avery \& Bartholomew... rridge pier, Avery \& Bartholomew
ridge pier, E E Colby Bridle, G. M. Strong.......
Broom machine, C. E. Lipe
Buckle, F. W. Schafer.
Burial case, E. Mes....
Butter cutter, Dugan \& Moncrief.
Butter dish, W. H. Fitch
Butter for packing, W. B. Bemis
Butter pail, J. Gilberds............
Button fastening, S. A. Hazelton
Cam motion, Houghtaling \&e Siviter
Cane and umbrella, M. M. Copp.
Car axle lubricator, w. Palm
Car coupling, M. L. Mathias
Car heater, G. W. Disman.
Car pusher, H. La Tourett
Car starter, $\mathbf{W}$. Jasper....
Carriage, portable engine $\mathbf{C} M$. \& Bet
Carriage, portable engine. C. M. Mililer
Cartridge, A. B. Smith.
Cartridge shells, varnishing, Pratt \& Reynolds.
Casting metals, C. \& B. H. Dusenbury
Centrifugal dryer, etc., J. Buchana
Chairand work table, G. L. Rich
Cigarwrapper, w. Broseker.
Clevis, Coonley \& Buckius
Clock lockwork, J. W. Williams (r)
Clothes drier, J. Kahn
Clutching device, H. Fuchs.
Coffee mill, protector, etc., W. A. King.
Coffee pot, R. L. Nelson
Coin detecter, counterfeit, J. A. Thompson
Cointray, A. A. Hyde... ....
Cooling liquids, A. D. Puffer.......
Cork, or bung for cans, otc., T. Tull
Cork, or bung for cans, otc., T. Tulls
Corn ball presser, C. E. Vankeuren.
Corn
Corn drill, D. Kerschner.
Corn planter, D. C. Bacon.
Corn planter, hand, W. .E. Seely
Corn Sheller, H. Neubert
Cotton press, c. J. Beasley
Cotton press, G. C. McKee.
Cotton press, J. Templeton.
Cotton seed planter, R. Ball
Crucibles, making plumbago, w. Smith ( r )
Crucines, Massel, I. C. Milligan...
Culinary ver.
Cultivator, fallow, J. Richardson
Cultivator, fallow, J. Richa
Dental plugger, K. L. Mills
Die for suckerrod joints, G. Douglass.
Door hande and catch, W. C. Folant
Dynamo-electric machine, D. F. J. Lontin
Eavetrough fastener, A. J. Gilbert
Egg carrier, W. J. H.
Egg carrier, W. J. H. Kappe.
Electro-magnetic regulator, R. A. Hayes...
Envelope, R. C. Carter...
Eyeglass, I. H. Johannes...................
Feathering paddle wheel, H. Williams.
Feed water heater, B. Eynon
Fence post, J. R. Peffley.
Fence post tip, D. C. Morris...
Fencewire barbed, J. McNetles
Flat iron heater, S. B. Dinsmore
Friction composition, C. F. Sec
Friction clutch, M. Rumely
Furnaces, supplying airto, W. Halsted
Gasmaking, illuminating, J. Absterda
Gas retorts, raking, T. F. Rowland (r).
Gear wheels, making, J. Comly (r).
Ginger snaps, making, Bell \& Hills
Glass pipe coupling, H. P. Humphrey.
Governor, J. W. Collet
Grain binder, Hodges \& Blim..
Grain elevator, floating, C. W. Mills (r)
Grainseparator, N. Kibler....
Grain separator, E.
Grate bar, E. Stroh
Grinding machine, G. A. Knowlton
Hammers, die for, Kip \&
Harvester, O. N. Skaaraas....
Harvester reel. E. . . Phipps.
Hay elevator and conveyer, J. R. Moran
Hay for fuel, winding, E. Harring.
Hinge forboxes, etc., A. F. Gerald.
Hinge forboxes, et
Hoe, O. H. Hicks.
Hoe, o. H. Hicks...............
Horse blankethine, D. C. Ay Merri
Horse collar, H. W. \& C. F. Whitney
Horse hay fork, P Grant
Horse hay fork, P. Grant.
Horseshoe, C. W. Atkinson
Horseshoe nail plates, beveling, J. M. Laughlin
Horseshoe nails making, J M. Laughlin...189,10
Horseshoe nails, making, G. L. Hall
Hose bridge, J. Taylor....
Hose coupling, A. E Rich
Hydrocarbon furnace, B.
Hydrocarbon furnace
Injector, J. Proeger
nkstands, flling and emptying, I. M. Fisher
Insulated wire, H. Redding
Ironing table, G. W. Hook
Ironing table, $\mathbf{T}$. Libby....
Knife escourer, P. Hanersperger
Knife scouring pan, Cassel \&
Knob latch, w. A. Barlow..
Knobs, to shanks, attaching, W. .........
Labeling machine, Knoch $\&$ Salomon

Lamps, center, Sherwin \& Hoopleple.....................
Lamp for hydrocarbon oils, etc., D.
Lamp, night, H. W. Huntington ...
Lamp or chandelier, oill J. F. Lauth
Lampscreen holder, J. E. Hubbell.
Lamp or chandelier, oil, J. F.Lau
Lampscreen holder,J. E. Hubbell
Lamp shade holder, H. L. Ives ...
189,161
189,027
Last, C. E. Cree
Lathe chuck $F$
Lathe chuck, F. Armstrong....
189,085
189,168
189,16
Leather goods, stamping, L. H. Urner............... 189,
Level, T. H. Burk
Lightning rod, L. . . Vermily........................... 189,0
189,

Paper boxes, L. P. Heath. ........................... $189,036,189,037$,

Pianoforte action, upright, F. Frickinger
Pictures, etc., preserving, L. T. Luther..
Pictures, etc.,.
Pile driver, steam, T. T. Loon
Pitman rod, B. E. Carpenter
Pitman rod, B. E. Carpenter.
Plaiting machine, T. Hagerty.
Plow, J. Preston....
Plow, R. B. Thomso

Plows, corn guard for, Murphy \& Bramell
Plowshares, making, c. H. Thompson....
Portraits, incasing pocket, J .
Press metaldrawing,
Projectile, D. K. Kennedy
Projectile, D. Kennedy......
Railway switch, S. H. Finch.
Railways, clamp for rope, W. Eppelshelm
Register and punch, N. A. Ransom....
Register and punch, N. A. Rans
Rod coupling, W. C. McClintock............
Rolling rings, and cylinders, R .
Rope clamp, Cater \& Powell...
Rope clamp, H. T. Smith............
Rope making machine. .t. E. Higby
Safe, provision, E. Webb.
Safe, provision, E. Webb...........
Sash balance, Kolb \& Osberghaus.
Sash hastener, W. T. Doremus...
Sash fastener, W. T. Doremus
Sash fastener, H. Jones.....
Sash fastener, H. Jones.....
Sash fastener, W. . Sparks
Sash holder, R. Holcroft....

Sewing machinemotor, Artley, Berg, \& Diterlea 189,
Sewing machines, button holes, E. Moreav......... 189,
Sew
Shaft coupling, G. A. Chapman ............. 189,
Shet metalelbow, N. I. Rothan .................. 189,
Shingle, metal, Locher \& Knispel ............... 189,
Shicklegrinder,'H. S. Stevens...
Silk, etc., dressing, C. Corron.
Silk, etc., dres
Skirt supporter, W. W.
Slate, F. W. Mallett.....
Slate washer, R. De Have
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Slate washer pipe, B. A. Jonasson
Smoking
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Soap composition, Baxter \& Horrocks
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Stamp, perforating, G. F. Almy.
Station indicator, J. H. Herzog.
Station indicator, J. H. Herzog.............
Steam and air brake, Taylor \& McCamish
team boilers, fre box, B. Hershey. team engine governor, B. A. West. Steam radiator, G. W. Blake..........................79,
Stop cock locking case, H. C. Meyer $\mathbf{C}$,总:
Stop cock locking case, H. C. Meyer \& Co. (r).
Stove, looking, E. P. Morong................
tove oill, H. P. Malone
Stovepipe wall thimble, C. Streit.....
Sugarboiling pan, etc., w. Clough
Sugar boiling pan, etc., W. Clou
Table leaf support, W. F. Daly.
Telegraph, dial, R. J. Sheehy
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Telegraph, dial, R. J. Sheehy
Telegraph multiple, G. Smith
Telegraph multiple, G. Smith ......
Telegraphy automatic, W
.
Thill coupling, T. J. Hubbell
Time globe, L P. Juvet.....................
Tireheating apparatus, S . Reed (r)
Tobacco pipe, J. Davis. ..............
Tobacco pipe, J. Davis. .
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Truck, garbage, J. O. A. Bennett.
Trucks, etc.,griping attachment, Thomaset al.
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Valve, balance slide, T. M. Nagle...
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Vehicle, side bar spring,
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Ventilator, kitchen

Ventilator, railway car, S. Darling........
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Wagon brake lock, S. H Miller...
Wagon seat spring, B.F. Well
Weed destroyer, J. A. Lees.............................
Windmill, D. Nysewan
Window blind, J. Miller.
Window mirror, P. W. Ralfs.
Window screen,. Calhoun...
Wool oil for glue, H. Thaulow.
Wool oil for glue, H. Thaulow..... ................... 189, 189,
Wringer, L. Sternberger...................... 189,

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