## RECENTLY PATENTED INVENTIONS.

## Engineering

Engine and Superheater.-James C. Walker, Waco, Texas. This invention comprises turn is utilized to automatically shift the steam-heatin and cutoff devices, the mechanism requiring bat a mini mum of power to move the piston, there being also pro-
vided a primary heating or steam-producing means arranged to sift the steam of all solid particles of water It is preferred to combine the use of this improvemen with a rotary engine, such as formerly patented by the
same inventor, and means are provided to retain the same inventor, and means are provided to retain th
heat within the several steam-holding compartments reservoirs, to utilize as far as possible its superheated energy.
Valve.-Thomas P. Ford, Brooklyn, N. Y. This is a combined regulating device and me
chanism for controlling it primarily designed for con trolling the draught under a boiler, to regulate the steam pressure, being also applicable to various other uses.
The invention relates to valves forming the subject of The invention relates to valves forming the subject of
two former patents issued to the same inventor, the present improvements being designed to promote a very sensitive action of

## Railway Appliances

SwITch.-John W. Umscheid and Charles H. Klute, Union Hill, N. J. These inventore
have devised a switch and switch-working mechanism which mav be conveniently operated from a passing train. Combined with the switch points are pivoted levers, there being connections between the levers and
the points and swinging arms for engaging the levers. the points and swinging arms for engaging the levers.
The working mechanism may be operatively connected The working mechanism may be operatively connected
to turn a number of switch points, turning either switch point at the discrimination of the operator on the train the mechan
Refrigerator Car. - Charles S. Hardy, San Diego, Cal. According to this invention an prising a folding ice box to which is hinged a drain flue ction with drip guards, the ice box sections bein adapted to open outward to position for use, and having locking devices to prevent the collapsing or folding of
the box by external pressure. The invention affords the box by external pressure. The invention affords simple means to prevent shifting cargoes from clos.
ing in the folding sections of the ice box, and also ing in the folding sections of the ice box, and also ing of novel construction.
Car Coupling.- Levi L. Freeman, broadlands, Ill. This is a coupling of the automatic ployed to connect two drawheads, by which the cars will be automatically coupled and may be quickly uncoupled from either side of the car. In a forwardly recessed,
oppositely slotted drawhead, are pivoted spring-pressed oppositely slotted drawhead, are pivoted spring-pressed
latch plates vibratile in the slots, side rods being adapted latch plates vibratile in the slots, side
Car Coupling.- James W. Elliott, Galveston, Texas. In the middle line of the drawbar of
this coupling is a vertical slot in which is pivoted a couphich reaches to just within the atch there is an eccentric upon a horizontal shaft, ther being crank arms adjustably connected with the ends of the shaft, by which the latch may be adjusted to engage entering links from cars of different heights. With this mprovement a whole train of cars may be coupled by having previously passed down the line and set all the ranks.
Illuminated Street Car Signs.Viliam H. Carroll, Jersey City, N. J. This inventor distinguish a car of a certain line at night, preventing passengers boarding the wrong car at night. The invention consists of an illuminated sign, in connection with a small lamp and reflector, to be arranged on the car
roof, the sign bearing the distinctive title of the route roof, the sign bearing the distinctive title of the route
the car passes uver, the whole arrangement being quite the car passes uver, the
simple and inexpensive.

Mining, Etc.
Amalgamator.-Lewis D. Coe, Leadville, Col. The mercury well of this apparatus has an outlet channel, and there is a chute above the well with a valved opening in its bottom, a supply pipe leading
from the opening in the bottom of the chute to the mercury well near its botton, the inner end of the suppl pipe projecting a short distance into the well and bein covered by a screen. The apparatus is designed to save all the precious metals and to permit of conducting the peration without interruptio
Coal Washer and Separator. Thoonas M. Righter, Mount Carmel, Pa. This is a ma-
chine for washing coal and separating it from the slate, chine for washing coal and separating it from the slate,
dirt and other refuse. The entre operation of washing and separating is carried on under water, there being provided convenient means of discharging the refuse
and coal at different points, and the work being done very rapidly and cheaply

## Mechanical

Sectional Wheel.-Perry H. Wiliams, Memphis, Tenn. This is a simply and strongly mame wheel which may be attached to a shaft without
removing the latter from its bearings. It is made in two half sections, each having a broken rim and sectional hub, the sections being united on the shaft by

Beam Flange Punch. - Robert H. Ireland, New York City. Two tables, at spaced disances apart, receive the web of the beam, according to
this invention, die plates being mounted on the tables adjustabiy by a screw-threaded shaft to accommodate different thicknesses of the web, the punching mechanisms

## being arranged over each die plate, and being adjusted simultaneously with the die blocks in a convenient and peditious manner. <br> Motor Charging Device. - James r. F. Conti, Paris, France. This invention provides means for automatically charging the reservoirs of cars points of their travel. The motive fluid is supplied through a main pipe, with branch pipes leading to the on the vehicle the delivery nozale rising as the vehicle passes, the charging nozzles having a vertical and a latmission of the fluid to the nozzle, a cock controling the admission of the fluid to the chamber of the piston valve, <br> Wire Glass Machine.-Francis Ryon, Streator, Ill. This is a machine to embed wire etting in rolled plate glass, and is intended for use in lass. With this machine it is not necessary to provide eat for the tables or rollers, other than that imparted by the molten glass while the sheets are being rolled, it being necessary on the other hand to apply cold water tervals. Less power is aloo required and a smoother fin

## Agricultural.

Cultivator. - Benjamin M. Rolph Dizon, Ill. This invention relates especially to disk cultiators, providing adjustible connections whereby disks hard, and for run readily in ground that may be very rienced of shifting them in the cultivation of crooked ows. Two disks are, in this cultivator, owing to their ing the weight required for their operation, and the ar rangement is such that the disks will not clog up in wet ground, while the machine may be readily converted into

Baling Press.-Hezekiah Bailey, Willamina, Oregon. This press is especially designed to
form a valuable adjunct to a thrashing machine, baling the straw as fast as delivered from the thrasher, and thus receiving a continuous volume of material in the feed chamber. Its construction is such that a bale is
formed at opposite ends of the press by the alternate trokes of the follower, there being opposite press chambers and an intermediate receivng chamber fed by the
feed belts.

## Miscellaneous.

Raising Sunken Vessels.--William A. and Fred E. Turner, Malden, Mass. According to with the deck or outside of the vessel, the receptacles being inclosed by an exterior netting, and attached to a chain to be passed around the vessel. In each recepracle ir pipe lead, the to tug air being thence pumped to fil ir pipe leading to a tug, air being thence pumped to an position by divers or otherwise, until sufficient air pressure is obtained to raise the vessel.
Can Soldering and Testing.-Noab L. Bishop, Wassaic, N. Y. In a plant devised by this partigly formed, and entered at one end, is automatically carried through the various machincs and delivered rom the final one completely finished and labeled if desired. The invention also provides an initial feed device, not liable to clog, though having many branches, tha being novel connections between the several machines, and the soldered cans being thoroughly and efficiently while passing from!one machine to another.
Wheeled Scraper. - Cary S. Heath, chine is arranged to expermit. For the and leveling, this mathe scraper blade according to the material to be treated or the depth of cut to be made. The driver's weight presses the scraper into the ground, in operation, and when the blade is sufficiently loaded with scraped-up by the rising of the driver from his seat. The dumper stands on the platform when moving the machine from place to place to hold the scraper blade off the road. A special attachment, with spring cultivator teeth, is provided tor orchard work.
Cfcle Wheel.-Samuel A. Donnelly. Chicago, Ill. This inventor has devised a simply and
strongly made wheel hub, of tubular body section, there being riveted to each outer end of the tube a flange whose perpendicular part connects with the spokes, while its horizontal part embraces and closely fits and reinforces bearing of the tube, where it receives the internal balle fiange to the tube forming stops for the ball-bearing cases. The sprocket wheel is secured by
the flanges connecting with the spokes.
Bookkeeping Apparatus. - Georg Gercke, Jr., Hamburg, Germany. In accordance with
this invention two boards or plates are employed, with metal bands, hinged clips, and a cutting apparatus, whereby loose leaves or sheets may be used in making dition, checking and copying, before the accounts are transcribed to the ledger, the sheets afterward affording coupons to be kept and classified after any necessary ultimate reference
Laws of Graviti and Mechanics. Justin S. Hemenway, River Falls, Wis. This inventor laws of falling bodies and some of the laws of mechanics, the apparatus comprising a suitableframe with graduated upright, there being journaled in the frame a horizontal haft with which is connected a cord to which a weight detent for are being a toothed wheel on the shart and detent for arresting the rotation of the wheel. xis of motion axially in line with the shaft, there being operative relation with the pendulum,

Leveling Instrument.-Erasmus F. Hargrett, Boston, Ga. According to this invention a
level bar is hinged to one end and a graduated arm pivoted to the other end of a base bar, there being an to the base bar having a curved arm provided with a uideway concentric with the hinge. A fastening de way of the to the level bar is made to engage the guideway of the handle. The instrument is designed to ditches, etc., for plumbing or setting posts at any in-
clination, or cutting
Fan. - George H. Newton, Monson, Mass. To permit the occupant of a chair to conveniently fan himself by a slight continuous tilting motion of an ordinary arm chair, or by rocking gently in a rocker, this simple and inexpensive device has been devised. A
standard carrying at its top fan wings is screw-threaded at about the height of the chair arm, and this screwthreaded portion of the standardis engaged by a loosely siding nut forming a portion of the outer end of an ar-
ticulated arm which is attached at its other end to the hair arm.
Gate Latch.-William F. Wilson, Cookstown, Pa. According to this improvement the
locking latch can be readily adjusted at all times in relation to the keeper in case the gate saga, and without removing the entire latch frame. The latch turns on a in the frame plate, the bolt being fastened in desired tion by a wing nut.
Fire Escape.-Henry Vieregg, Grand Island, Neb. This is an improvement upona formerly ment especially consisting of a brake automatically con trolled through a governor, whereby the rapidity of descent will always be kept within a safe limit, an auxiliary brake being also provided in connection with the

Fire Extinguisher Valve.-Henry P. Amos, Chicago, Ill. This is a valve which 1s auto-
matic in operation, and is designed not to be affected by matic in operation, and is designed not to be affected by increase in the water pressure. It has a stem com-
prising two parts which normally align to hold the valve to its seat, a pressure device forcing the joint in one direction to bring the sten sections in aligument, while a spring acts in the opposite direction t.
ing the stem sections out of alignment.
Sash Fastener. - John B. Lashbrook, Oxford, Neb. This is a simple, inexpensive and reliable making a dust proof lock of the sash joints. The improvement comprises a serrated keeper strip along one side edge of the sash and fast on the casement, a ser-
rated locking strip engaging the teeth of the keeper one sash when slid on the ted teeth, and adapted to bind device to slide the locking strip
Gutter Attachment.-George Andrews, Bellows Falls, Vt. To prevent damage from ice
and snow to the gutters and spouts on buildings, this inand snow to the gutters and spouts on buildings, this inthe gutter may betipped up beneath the eaves, and the spout also turned beneath the eaves of a building, so
that neither will collect snow, ice, or other matter, while in case of rain the spout and gutter are both turned

Support for Mops, Brooms, etc. Henry H Holmes, Council Bluff, Iowa. This holder, which may be conveniently secured to a wall or elsewhere,
for holding a broom, mop, etc., ready for use, consists of for holding a broom, mop, etc.., ready for use, consists of which to the passage is a rubber abutment, against ner end of a spring lever oppositely fulcrumed, the lever.
Design for Sash Fastener Frame. William D. Wilkinson, Toronto, Canada. From a flat base there rise plane parallel sides presenting separate
spaced figures at the front and top, the sides being cut away obliquely on their rear edge from near the base $t$ he top
Note.-Copies of any of the above patents will be furnished by Munn \& Co., for 25 cents each. Please
send name of the patentee, title of invention, and date of this paper.

## NEW BOOKS AND PUBLICATIONS

## a Frogland Wedding Words

 illustrations by Roy Conger. Music Lee. Price boards 50 cents, holiday binding $\$ 1$.The Century Cyclopedia of Names. A pronouncing and etymological dictionary of names in geography, biography, mythology history, eth-
nology, art, archæology, fiction, etc.
Edited by Benjamin E. Smith. New York: The Century Company.
Pp. vii. 1085. Price, cloth, $\$ 10$; full sheep, $\$ 15$.
This superb work is a supplement to the Century Dicnary and must be considered as snch in all criticisms. It contains biographical notices, historical facts, literary tities, descriptions of books, and a vast amount of other
encyclopedic information which properly was not put into encyclopedic inimarion which properly was not put into of the dictionary, because in many cases what seem totbe omissions in it will be found treated in the five volumes that preceded it. For instance, under "pons " the cy-
clopedia does not give the familiar " pons asinorum," clopedia does not give the familiar "pons asinorum,",
which might seem to be an omisson, but on turning to the Century Dictionary we there find the subject treated fully. The general make-up resembles that of the Cen-
tury Dictionary, the page matter being contained in tury Dictionary, the page matter being contained in
three columns. It would be easy enough to find omissions, and we have, naturally enough, found several, but it hardly seems necessary for us to give them, as the
book is one of genuine merit and deserves the warm
praise of all. Its biographies are pre-eminently satisfac-
tory, for although we have termed them biographical tory, for although we have termed them biographical
notices, they are so condensed as really to give a full of the leading points in the lives of their subjects.
Radiant Suns., A sequel to "Sun, Moon and Stars." By Agnes Giberne.
With a preface by Mrs. Huggins and
many illustrations. New York: Macmillan \& Company. 1894. Pp. xi, 328. Price $\$ 1.75$.

This beautifully illustrated book by Miss Giberne, with apreface by Mrs. Huggins, is a testimony of what women be something in astronomy and in the higher mathematics especially congenial to the female mind. This elegant work forms most interesting reading. We would, writing the story of Galieo, to have read the admirable nonograph on this great investigator published in the are broughtout the very curious errors perpetrated by him in astronomy, and the curious and false bases he selected in his upholding of the Copernican system, some-
thing far too littleappreciated, the tendency of the day being to uphold Galileo as one of the early provers of the true theory of the earth's motion, whereas he rather dgured as the reverse in attempting to uphold it on false reproduction of a photograph of Dr. Huggins, which was taken by his wife. Dr. Huggins new spectroscope forms the background for this picture.
The International Annual of An-


A beautifully printed annual on photography, containing 21 full page illustrations, and a great variety of articles on all sorts of subjects relating to photography,
besides numerous formulx. We note an interesting illustrated scientific article on the timing of shutters, by James E. Boyd and Thomas E. French, of Ohio State University, a subject more apropos to hand cameras, where the speed of the shutter should be known. Charles Richard Dodge describes how to photograph by gas light. Harry W. Smith explains a novel method of making me lig the new printing process, a method of making collotype tion on lantern slide making, and descriptions of the best methods of development, especially with the new agent metol. The comparative illustrations of telephoto work by Professor D. L. Elmendorf demonstrate the great
value of this new form of lens. Dr. Hugo Schroeder gives a few historical notes and a brief account of the recent improvements in photo lenses. It will be found teresting. It should be on the table or shelf of every photographer.
Popular Engineering. Being interesting and instructive examples in
civil, mechanical, electrical, chemical, mining, military, and naval engineering graphically and plainly de-
scribed and specially written for those about to enter the engineering profession and the scientific amateur, and erngineering schools and colleges. Spon. New York: Spon \& Cham-
berlain. 1895. Pp. viii, 496 . Price ber
$\$ 3$.

Itlis a thoroughly practical work, treating of all sorts of practical scientific work, from chemistry, civil and mechanicalengineering to shipbuilding. The illustrations are very numerous, not always of the finest quality, but
graphic and attractive, and we believe that the work will be found a decidedly popular and usefulone. We notice reproduced in it matter familiar to our readers. We may pass without notice its minor inaccuracies. Some details
of the ancient history of engineering-for the work of seventy years are especially interesting. The section of perpetual motion might be

## The Ae <br> Aeronautical Annual. $\begin{gathered}1895 . \\ \text { Edited by James Means. } \\ \text { Moston, } \\ \text { Mass.: W. B. Clarke \& Co. No. 1. }\end{gathered}$.

 Pp. 171. Price $\$ 1$.Mr. Means is himself an investigator of aeroplane soaring, and this annual is devoted largely to old-time records of attempts to fly. Curiously enough, comparatively little is said about cilienthal, Maxim, and Langley, and the publications of the early part of the century. The utmost, then, that we can assume this annual to be, is an introductory number of a series which may eventually reach a point where the annual issues will represent the work of the present day. If the publication is con-
tinued, we see no reason why it should not do so next tinued,
The British Journal Photographic he British Journal Photographic
Almanac For 1895. Edited by J.
Traill Taylor. London : Henry
Grenwood \& Co., 2 York Street,
Covent Garden. 1894.16 mo Pp.
1344. Cloth and paper. Price 50 and 75 cents.
The British Journal Ahnanac isalways a welcome visiwhich have been contributed and the valuable formulas which have for many years formed one of the features of the book. The large size of the volume is owing to the number of advertisements, which occupy 850 of the
1344 pages. It would be a mistake to suppose that 1344 pages. It would be a mistake to suppose that
these advertisements are without interest. All of the these advertisements are without interest. All of the
latest apparatus and materials for all branches of photoreaphy and photo-m material frinting proceses photoscribed. It is unfortunate the publishers should have
adopted a continuous pagination for reading matter and advertisements. The samples of work given do not com-
pare favorably with those of the American annuals. In
the introduction the editor has summarized the progress the introduction the editor has summarized the progress
of the year in saying : "If the year just closing has not been remarkable for the introduction of any new photographic process of cardinal importance, steady progres
and improvement in most branches has still to be re corded."
Publications of the Lick Observa TORY OF THE UNIVERSITY OF CALI mento: State Office. 1894. Pp. 229 This report contains not only the purely astronomical It will be a sine qua non in every aspronomical library but it is also of interest to all cultured readers. The moon supplies a great part of the text, and a most superb serie of plates from negatives taken at the observatory illus ,
The Repair and Maintenance of Machinery. By Thomas Walter
London: E. \& F. N. Spon. New York :
Pp. x, 466 .
Price This practical work seems toreallycover, to a certain extent, a new field, relating as it does to the repairing of broken parts of machines. The book is excellently
printed and contains a very full text, and it is impossible to believe that it does not fill a most excellent field and it will doubtless be very acceptable to the practica machinist in this country. It is elaborately illustrated and contains a good index.
The Mechanism of Weaving. By T. M. Fox. London and New York
Macmillan \& Co. $1894 . \quad$ Pp. xx, 472. Price $\$ 2.50$.
This work naturally does notlend itself to review.
enough to say that it appears to embody an elaborat is enough to say that it appears to embody an elaborate
treatment of the subject, with numerous illustrations and full and eatisfactory index. In its make-up it is worthy of all commendation; the illustrations are particularly clear and the type and paper most attractive, while as a
sample of ornamental and suggestive binding it is especially to be noticed.

## SCIENTIFIC AMERICAN

BUILDING EDITION
JANUARY, 1895.-(No. 111.) TABLE OF CONTENTS.

1. An elegant plate in colors, showing a Colonial cot-
tage at Williamsbridge, $\mathrm{N} . \mathrm{Y}$, recently erected for Chas. H. Love, Esq. Two perspective elevatio and floor plans. Cost complete $\$ 4,250$. Mr. A
thur C. Longyear, architect, New York City. pleasing design.
cently erected for J. O. Noakes, Esq., at Iselin' Park. Two perspective elevations and floor plans. Cost $\$ 5,000$ complete. Mr. Manly N. Cutter,
architect, New York City. An attractive design. Colonial residence at Montclair, N. J., recently erected for Sylvester Post, Esq. Two perspective
elevations and floor plans. Messrs. W. S. Knowles A. H. Thorp, architects, New York City. pleasing design.
2. A seaside cottage recently erected for C. H. Man-
ning, Esq., at Kennebunkport, Me. Two perpective elevations and floor plans. A picturesqu and unique design after the "New England lean-to roof or
Boston, Mass.
3. A residence at East Orange, N. J., erected at a cos of $\$ 7,000$. Architect Mr. W. F. Bower, Newa 6. The First Presbyterian Church at Stamford, Con design of great architectural beauty, treated in he Romanesqu style. Mr. tect, New Yor
turges, Esq., at a cost of 85,000 complete tect Mr. E. G. W. Dietrich, New York City. Per a summer elevation and floor plans.
A summer residence at Cushing's Island, Me., reperspective elevations and floor plans, also an inand, Me an excellent example for a
4. View of the Armory of the Seventy-first Regiment, New York City. Architect Mr. J. R. Thomas, New York City.
5. Perspective view and floor plans of the fourtee ${ }^{\text {story Reliance Building, Chicago. }}$
Miscellaneous contents,-Buffbrickpopular.-Ceiling
and cornice tinting.-Home ground arrangement of plants, illustrated.-Stone dressing by com of plants, illustrated.-Stone dressing by com-
pressed air, illustrated.- Brick dust mortar.-Interesting ruin of cliff dwellers.-Removing the
front wall of a warehouse, with sketches.-Improved woodworking machine, illustrated. -Buff brick in New York.-Ceiling paper.-"Dec-co-lustrated.-Improved gutter hangers, illustrated. Draughtsman's supplies, illustrated.
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## PBusiness and Wersonal.

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Woven wire brushes.-The Belknap Motor Co., of Portland, Me. are tbe patentees and manufacturers of Competent persons who desire agencles for a new popuiar book, of ready sale, with handsome proft, ma apply to Munn \& Co., Scientific. American office. 361
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be repeated; correspondents will bear in mind that be repeated; correspondents will bear in mind that
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though we endeavor to roply to all either by letter or in this department. each must take his turn.
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sooks referred to promptiy supplied on receipt of Minice.
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mor examination should be distinctly
(6349) S. W. asks: 1. Having given inches as length of coil and 11/2 inch as diameter of iron core, how many ampere turns are required to magnetize the said core to saturation, and how great (approximately) would be the lifting power of the electro magne
so formed ? A. Owing to leakage and to the fact the here is no real katuration point, no exact answer can be iven with increase of the magnetic power on accounto thelongair path. 2. If I place two electro magnets end to end with poles near togcther, is the combined attra tive power increased, i. e., will the magnets each pul
more than they would acting separately on armatures A. The combined power will be the same if simila face the same way
(6350) T. H. B. writes : 1. Are all points of the earth's surface at the same potential (electrically)? minerals, metals, or acids in certain combinations, the potential might be higher at one place than at another, nd that, owing to this difference of potential, a curren sufficiently strong to operate instruments in circuit, even when all batteries were removed from the wire. (Th heard that this experiment has been successfully tried on certain lines removed from any sources of induction. Is or is it due to other sources, and is not such a current if it exist, properly called an earth current? A. Earth arrents so caled act as tescic. Their canse is obscure, but they are due to chemical changes. Telegraphic
messages have been transmitted by them. 2 What becomes of the energy of a coiled spring when dissolved (under tension) in acid? I have seen the answer to this questionin an earlier copy of the Scientific Ameri
CAN, but cannot recall it. A. The so-called energy is imply the capacity to convert heat into mechanical nergy. If a spring does work, its temperature falls. By destruction of energy
(6351) H. C. R. writes: 1. Do you consider a plastered ceiling safe that has been saturated
with water during a cyclone; and then again soaked before the roof could be repaired? A. No; not safe. 2. Would not the vibrations of a powert 1 church organ
tend to bring down such a ceiling? A. Yes. 3. Can such a ceiling be thoroughly examined by simplyinspecting the keys from above? A. No. 4. Is it not possi-
ble for the keys to appear all right, while the plastering he for the keys to appear all
given way below? A. Yes.
(6352) R. W. K. asks: In designing a to seventimes the weight of iron in the fild as in the armature? Is it necessary that the spaces between the pole pieces should be five times the air gap? A. The
factors given merely represent good general practice; factors given merely represent good general practice;
there is nothing absolute about them
(6353) A. T. asks if following dimensions and windings of dynamo will generate 30 amperes with a potential of 52 volts at the brushes: Length of
wrought iron field magnets 816 inches by 5 inches diam wrought iron held magnets $88 / 2$ inches by 5 inches diame red wire, 10 layers, 140 turns on each leg of magnet rmature $4 / 4$, wound with No 12 doubb otton lam d wire, 32 coils, 4 convolutions in each coil, speed about 1, 800 revolutions per minute, general shape of dynamo about same as 60 light dynamo in Supplement, No. 865 A. If you succeed in getting the above results, you wil a well. If shuntwound, the product of your armatas nal resistance, or say three ohms.
(6354) J. P. G. asks: In making a Gramme size $31 / 2$ inch diameter armature of 12 section layers and convolutions if wires on each section are of equal length? A. To secure a uniform current there should be an equal number of turns of wire in each se (6355) length is not necessarily identical.
(6355) A. B. says : I take the liberty to ofer a suggestion to your answer to F. G. C.'s query, No. ing the Sointific american of December 22 , for tell ing the points of the compass by the aid of the sun and a
watch. If the hour hand of the watch be pointed at the un-the watch lying flat-half way between the hour hand and twelve on the dial will be south. After south is located the other points are easily determined. Doub less a compass would be more correct, but the method iven will be found correct enough for ordinary requir
(6356) S. R. H. writes: I have a few ques tionsthatI would be glad to have answered in Scien Heic American. how sar could a person live below deep? Would the air become too dense or compact for them? Is it not a fact that the earth's surface acts as a medium lineforthe center of gravity, atmospherir and water pressure? How far above the earth's surface is the air considered to be pure and healthy, to contain no poison matter? A. The depth at which a person can ive below the surface of the earth depends upon the
condition of temperature and the constitctional ability of the person to bear heat The internal heat of the earth increases $1^{\circ}$ Fah. for every 50 to 70 feet of verical depth in various regions, so that from 2,000 to 3,000 eet in depth is about the limit that a man can work. In parts of the earth which have been subject to volcanic ction,as in some of the mining districts, the temperature ises somewat more than $1^{\circ}$ in 50 feet, and $120^{\circ}$ is the temperature at about 1,500 feet in depth. At this tem-
perature labor is very difficult and forced ventilation has oo be resorted to, and by this resource a depth of 4,000 feet may be attained in the undisturbed strata of the earth. The earth's surface is the plane of demarkation for atmopheric and water pressure. The barometer indicates ecreased pressere as gown mines, the same a in ascending in the air. Water also increases in pressure s the distance beneath the sea. The atmosphere has
known difference in composition at the greatest heights observed. It is its lightness or rarity that affects the langs at great heights.

## TO INVENTORS.

An experience of nearly fifty years, and the preparation
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of more tban one bundred thousand applications for pa
tents at bome and abroat, enable us to understand the
aws and aws and practice on both continents, and to possess
equaled facilities for procuring patente vervmpere. A
Ynopsis of the patent laws of the United States and a



INDEX OF INVENTIONS For which Letters Patent of the

January 8, 1895
AND EACH BEARING THAT DATE.

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Marray $\quad$ oues. cutter for trimming. J. J
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