## The Cost of British ships of War.

A Parliamentary paper recently issued throws much light upon the cost of warships and their armament, machinery, etc. The prices given are mainly those to contractors, but from other sources the expense of building ships in the public dockyards can be obtained. No real comparison can be drawn between the two, of course, for the maintenance of the public yards is imperative for many sound reasons, and therefore there are items connected with the cost of vessels built in them from which those constructed in
the private yards are free. However, when we rethe private yards are free. However, when we re-
member that the private builder has to make a profit, we must not be surprised at the cost of employing them, and it has been fully demonstrated that it is as essential to the efficiency of our resources to give experience to the private contractors as it is to maintain public establishments. Messrs. Thomson, of Clydebank, for the hull and machinery of the battleship Jupiter, are to receive $£ 732,683$, and for the cruiser Terrible about $£ 570,000$. Messrs. Laird will receive for the battleship Mars, £733,211; and the Barrow Company as much for the cruiser Powerful as Thowsons do for her sister ship. Messrs. Maudslay, who
are the agents for the Belleville boilers in England receive in royalties for the French firm, $£ 10,600$, but they will not construct the boilers in their shops. The Talbot class of cruiser, of which several are being constructed in Scotland, costs about $£ 210,000$ apiece, while the torpedo boat destroyers average about £35,000 apiece.

## Rewards for Inventors.

According to an article in Engineering. a very early case in which the work of an inventor was rewarded is recorded by the celebrated Italian philosopher Jerome Cardan. In his work "De Subtilitate," which first appeared in 1550, he speaks of an artificer of Brixelendum who had invented, among other ingenious devices, a machine for sifting or bolting flour, for which he had obtained a privilege from Cæsar. Brixelen-
dum, or, as it appears in some of the later editions dum, or, as it appears in some of the later editions
of the book, Brixelensem, is probably the same as of the book, Brixelensem, is probably the same as
Brixellum, now Bresello or Bregella, a town in Italy,
on the Po. The Casar referred to would appear to have been the Emperor Charles V, who held very en lightened views on government, which, unfortunately his stormy reign prevented being carried into effect to any considerable extent.
Quoting from the French edition of 1556, Cardan explains that he alludes to the invention "in order that men may understand how it is possible to acquire great riches by little things, provided that they are ingenious. [This 'sentence reads very like some productions that we come across in our own days.]
For now that the bakers have this instrument for For now that the bakers have this instrument for
their profit, and that the inventor has the privilege of Casar that no one can have it without his consent, he is so busy that in a brief time he has built a house." Cardan gives a sketch of the machine, which comprises a casing inclosing an inclined sieve provided with a knocking device operated by a hand wheel outside the casing.
The earliest authentic cases of the grant of patents in England date from 1560. They are discussed in ar ticles in Engineering, vol. xxxvii, pages 804 and 773, the former treating of the introduction of the manufacture of hard white soap, the latter of saltpeter, into this country. The first recorded instance of reward to
an inventor occurs in the same year, when Jacobus an inventor occurs in the same year, when Jacobus
Acontius, of Trent, was granted an annuity of £60, apparently as result of his petition in the preceding year for the issue of a prohibition against the usage, without his consent, of his discovery of wheel machines for grinding or bruising, and furnaces for dyers and brewers. It appears that a few years afterward he received a patent also.
In 1565 John Humphry, in the Tower, received a patent for the "sole use of a sieve or instrument for melting of lead, supposing that it was of his own invention." He appears to have brought an action for infringement. In court the question was, as stated by Noy, " whether it was newly invented by him, whereby he might have the sole privilege, or else used before at Mendiff, in the West Country, which, if it were there before, the court was of opinion he should not have the sole use thereof." Emery Molyneux, how-
ever, in offering the Queen (Elizabeth) in ever, in offering the Queen (Elizabeth), in 1570 , his
inventions of shot, artillery, etc., appears to have
thought it a sufficient recompense to be allowed to enter her service. Another inventor, in 1575, brought forward "an engine of war whereby 24 bullets can be discharged from one piece at a time;" he wished for a pension. In the same year we have the application of Peter Morrice, a German, for a patent for the sole right of making and employing certain hydraulic en gines for the raising of water, draining marshes, etc. A few years afterward this invention was applied a Old London Bridge for the purpose of forcing up river water into the city for drinking purposes.

## Do Horses Weep?

Do horses weep? is a question discussed by our con emporary the Admiralty and Horse Guards Gazette. It tells us that there is a well authenticated case of a horse weeping during the Crimean war. On the ad vance to the heights of Alma, a battery of artillery be came exposed to the fire of a concealed Russian bat tery, and in the course of a few minutes it was nearly destroyed, men and horses killed and wounded, guns dismounted, and limbers broken; a solitary horse which had apparently escaped unhurt, was observed standing with fixed gaze upon an object close beside him ; this turned out to be his late master, quite dead. The poor animal, when a trooper was dispatched to recover him, was found with copious tears flowing from his eyes; and it was only by main force that he could be dragged away from the spot, and his unearth ly cries to get back to his master were heartrending Apropos of the intense love that cavalry horses have for music, a correspondent of the Gazette writes that when the Sixth Dragoons recently changed their quarters a mare belonging to one of the troopers was taken so ill as to be unable to proceed on the journey the following morning. Two days later, another detachment of the same regiment, accompanied by the band, arrived. The sick mare was in a loose box, but hearing the martial strains, kicked a hole through the side of her box, and making her way through the shop of a tradesman, took her place in the troop before she was secured and brought back to the stable. But the excitement had proved too great, and the subse the excitement had proved to
quent exhaustion proved fatal.

## RECENTLY PATENTED INVENTIONS.

## Agricaltural.

Planter.-Walter W. Burchell. Sutherland, Iowa. This inventor has devised a self-dropping
attachment operated from one of the ground wheels and attachment operated from one of the ground wheels and connected with the seed drop slide. The attachment with the ground wheel, and may be readily applied to any planter having a reciprocating drop slide, or a drop slide of any type with a change of coupling.
Plow Stock. - Joseph W. Abbott, ockhart, Texas. A cultivator frame of simple and in
expensive construction is set forth in this patent, the expensive construction is set forth in this patent, the
frame admitting of being conveniently changed to facilitate the grouping of the sheaves or plows to be carried by the stock. The frame lateral zigzag beams forming three projections at each side of the central beam, there being adjustably secured
to the projections side beams to which are connected handlea.

## Electrical.

Heating Rug.-Jesse R. Davis, Parkersburg, West Va. A casing containing a resistance
coil, according to this improvement, has two electrodes coil, according to this improvement, has two electrodes
concentrically arranged therein and a metallic distributing plate extending entirely across both electrorles and properly insulated therefrom. The outer case may be o
wood, canvas covered with asbestos, metal, porcelain etc., and the rug may be of any desired shape most con-
venient for heating or warming the feet, under desks, in venient for heating or warming the feet, under desks, in
carriages, or on floors anywhere, the heat as it is transcarriages, or on floors anywhere, the heat as it is trans-
formed from electrical energy being retained by the restance of the heating medium.

## Miscellaneous.

Revolving Air Pump.-Vatslav A Hasko, New York City. For readily forming a vacuum in electric light globes and other apparatus this inventor has devised a pump in which a bulb is mounted to turn aboat an inclined axis passing approximately through the center of the bulb, the latter containing a pumping
liquid, while a pipe adapted for connection with the artiliquid, while a pipe adapted for connection with the arti-
cle to be exhausted is connected with the bulb, to turn with it. Thepipe is arranged at such an angle to the inclined axis that by turning the bulb with the pipe the liquid will be caused to flow outward from the bulb o return into it. At each revolution of the device an
amount of air corresponding to the capacity of the bulb and pipe is drawn from the vessel to be exhausted apped and discharged.
Watchcase. - William M. Rush, Jr., St. Joseph, Mo. This case has a postage stamp holder
in one of its lids, and a corresponding recess or depression in the adjacent lid, the stamps being held against
displacement by an overlapping thin piece of spring maerial.
Fish Hook.-Frank D. Pettey, Hampshire, IIL. This device comprises a rod with a device for
holding bait in connection with self-opening hooks which holding bait in connection with self-opening hooks which
are closed and concealed at their points, but which are adapted when released to spring in opposite directions,
the locking device being released to tension on the line. When the fish lis landed it may be readily released from
the line the hook.

Decomposing Substances by AmmoGis SAlrs.- Eduard R. Bescmfelder, Gross Mochbern, Cermany. This invention is for a process of separatig
metals from ores and other insoluble materials, and for
the ntilization of certain waste materials, as strontian the ntilization of certain waste materials, as strontian residues from the desaccharization of molasses, permit-
ting the recovery of the reagenta. At the critical pressure and temperature the compound is treated with ammo nium chloride in a dry state, the superfluous reagen
with the volatile products, being separated by distillation with the volatile products, being separated by distilation
or sublimation from the non-volatile residue, and from this the soluble part is separated by a solvent.
Type and Matrix. - Coelestin Skameans of forming matrices for linotype machines, means asting short letters and assembe maching them into
frror cat
word, with space bars between to form the proper length of line, and then casting a backing on the line to unite with the short letters and fill the spaces between the
words. The line matrix comprises single short type with a cast backing to make the matrix the
the spaces between the words being filled.
Woven Chenille Fabric.-Leedham Binns, Philadelphia, Pa. This invention relates to a
formerly patented invention of the formerly patented invention of the same inventor, the which are separate sete of warps some of the wefte passing over the central warp and others under it, the wefts
forming bends where they bind the central warp and forming bends where they bind the central warp and
the ends of the wefte projecting from the outermost tuft or loops Hasp. - William Firfield, Perth Amboy, N. J. This hasp is so formed in sections that when applied to an object and engaged with a staple or othe keeper, the section secured to the support by screws or fastening devices will be completely covered by one of
the other sections, which will extend over its face and the other sections, which will extend over its face and
top and bottom edges, rendering it impossille to remove the fastening devices while the hasp is in locking enment with ite keepe
Stove.-James A. Carroll and William his stove is suspended a heating trum fre chamber of wall inclined downward and rearward from the side adjacent to the stove door, there being an air flue communicating with the interior of the drum. The cold air is taken from the floor and carried to the drum, where it is heated without coming in contact with the fuel,
and the fre may be reduced and controlled without danand the fre may be reduced and co
ger of gas escaping into the room.
Ditcining Machine.-Alexander Mann, Berkshire, Mich. To effectively dig up the ground ing place, this machine is made with a pair of winding drums and carrier rope, scrapers being detachably secured in the runs of rope, while a pivoted boom carries a hoist-
ing.rope with means for engaping the scrapers. There ing.rope with means for engaging the scrapers. There
is a wheel on the pivot of the boom to which is secured a rope having its ende fast to a second pair of winding drams, and
Ore and Coal Loader.-Patrick H. Hageney, Ashtabula, Ohio. This machine comprises a nected with the boom have a sliding motion to push the
bucket into the material to be raised to flll the bucket The machine ispreferably mounted on a truck on which
turns acabin or house containing the operative parts, to
be maripulated from within the cabin, and is more especially designed to facilitate loading coal, ore, and other material into cars.
Diving Apparatus.- Hubert Schon, Allcgheny, Pa. This apparatus is more especially designed to properly locate sunken vessels preparatory to raising them. It consists principally of a casing with rames having angular flanges bolted together, panels set and fastened in the frames, a top bolted to the upper end
of the casing and adapted for connection with a cable while a bottom bolted to ita lower end carries a weight It is made of a size to permit two or more persons to occupy the casing several hours without change of air. It has glass panels and is lighted from the iuside, to per-
mit the occupants to closely examine sunken objects mit the occupants to closely examine sunken objects as

Grain Scalper. - Adam W. Haag, Fleetwood, Pa. This improvement relates to screens for bolting flour, etc., providing a screen to be supported in
horizontal position and have a gyratory motion with horizontal position and have a gyratory motion with quick return. With an uninterrupted motion the screen ment of the screen rearward or in the direction of its head being much greater than the movement in direction of ite tail, causing the material to move in the direction of the tail, whereby the advantages of the gyratory mo-
tion are obtained and a feed is provided for the screened material.
Bicycle.-George B. Thomas, Duran go, Col. The driving mechanism of this wheel is de signed to give increased power and speed as compared with the ordinary treadle power. The rear or drive wheel of the machine is much larger than the front or
steering wheel, and both have supplemental interior rims, the rear wheel having also an inner fly wheel. The nain frame has front and rear yoke portions and the portion has cranks connected by pitmen with ant yoke the main axle, the crank motion being thus more directly and uniformly distributed at each side of the
drive wheel
Starting Race Horses.-James T Andrew, Montzomery, Ala. To facilitate the starting o stalls, to be operated singly or in sections, with gates all rider to pass out , struck from behind by a striking arm. The construction is such that the stalls may be conveniently set up and operated on a race track and readily taken out of the
Portable Kitchen Cabinet.-Lester Haskil, Fort Meade, Fla. For conveniently keeping, and sifting when required for use, flour, meal, etc., this inventor has devised a neat and compact cabinet which
can be made at a low cost, means being provided for can be made at a low cost, means being provided for
atirring the meal or grite as drawn from the bins, so that tirring the meal or grits as drawn from the bins, so that be kept clean and in good order. The cabinet also has drawers for spices, sugar, etc., and is
preferably mounted on casters, so that it will be as preferably mounted on casters, so that it will be
convenient to move about as a table or other article furniture.
Charr.-William G. Magee, Hudson, N. Y. An invalid chair which combines the functions
of a reclining chair, a rocking chair and a wheeled chair of a recining chair, a rocking chair and a wheeled chair
is propided by this invention. The position of the chair
in relation to the wheels is shifted by a simple adjusting mechanism, there being other novel devices for changing
the chair from one form to another, the chair being autothe chair from one form to another, the chair being auto-
matically converted from a reclining to a roller chair by simply moving the body and rocking the chair forward.
Sash Lock. -Irving Elting, Saugerties, J. Y. This is an improvement Elting, Saugerties, invention of the same inventor, providing an improved device for positively preventing a rotary movement of the locking plate which engages horizontal grooves on
one of the sashes to hold it against vertical movement. Wlre Fastener.-Oliver Swift, Aberdeen. South Dakota. This is a device for securing the headed stem passed through a porforation in a clamp ing block having at one side a projecting toe adapted to enter the post, the toe being separated from the perforation through which the stem passes by a space which re-
ceives the fence wire. A wire fence can, with this fastceives the fence wire. A wire fence can, with this fast-
ener, be built more cheaply, as the posts may be placed ener, be built more cheaply, as the posts may be placed
farther apart, it being imposible to force the clamps out, farther apart, it being impossible to force the clamps out
the wire breaking rather than pulling out the clamps.
Bonbon Dipping Machine.-Leo Hirschfeld, New York City. A table pivotally mounted upon a frame, according to this improvennent, has chanels upon one of its faces to receive the material to be
dipped, there being means for holding one end of the table elevated. Located over the channeled portion of the board is a feed wheel having a series of radiating blades, and the motion of the wheel is controlled by a ratchet and pawl mechanism. 'This wheel is mounted in
adjustable bozes to be raised or lowered to suit different adjustable boxes to be raised or lowered to suit different
sizes of material, the machine affording a quick and effisizes of material, the machine affording a quick and effi-
cient means of dipping candies in making any form of cient means of
confectionery.
Fork for Dipping Bonbons, etc.dapted to receive other confectionery, the candies after dipping being simultaneously dropped into the moulds or wherever they are to be deposited. The head of the fork has tines
mounted to turn and having receivers to hold the bonbons, there being also in the head a rack and a trigger operated mechanisa whereby the tines may be turned Coffer Surpog the fork
CoFFEE SURROGATEE-J eremiah B. and'yetprovide a beverage of good quality and flavor, this inventor has devised a compound to be used in connecsugar, caffeine, cream of tartar, caffeol and corn starch, mixed and roasted in deecribed proportions.
Lamp. - James Forsythe, Pittsburg, Pa. This lamp has valve devices by which, no matter which way the wind blows, the air passages to the windward will be hela closed while the others remain open,
there being also in the top an inverted cone-like deflector to prevent the currents of air having a counteracting effect on each other. The air valve devices are also designed to prevent the lamp from being smothered by becoming clogged with soot or by the condensations fre

Horse Checking or Unchecking.Felix H. Kittrell, Loco, Tenn. This invention is for an neck rein to dollow the horse to lower his head, and the heck rein, to allow the horse to lower his head, and the
out of the vehicle. The check strap is extended beneath a gripping cam on the saddle and is made to act on a
rearwardly projecting arm to release the cam by being lifted or moved upwardly. To check up the horse again it is only necessary to pull back on the strap
Knee Protector.-Thomas B. Walker, Honolulu, Hawaii. For the use of cavalrymen thisinventor has devised a new article of mannes, etc be made of leather, rubber or waterproof cloth. It com prises both a knee and thigh protector, arranged for read bots or wieg each other and with the trousers legs or angular shape, with side flaps at the lower comers trin roundedhat the top to conform to and bendover the knee
String Fastener.-Charles C. Pine New York City. For fastening shoes, corseta and othe holding the atring end without tring the string or using springs, jaws etc the fastener being signed for use with flat stringe. A body piece adapted to be fastened to the shoe or corset has a narrow slit fo
the passage of the string, the slot being arranged in alignment with the back pull of the string, and the latte passes over the body piece and twists on entering the lot. Only the string end has to be passed through
Paper Doll. - Edward T. Gibson, Minneapolis, Minn. This invention relates to dolls in which changes of costume can be made by the adjustand shoulders, and preferably destitute of head and nect By means of a locking key the assembled parts of the doll are so firmly held together that the doll may be tossed about without disarranging the parts, and an ex tension of the key serves to support the doll in nearl upright position.
Game Apparatus. - Joseph Jessup, Woodburg, N. J. A game to be played in simulation of the game of football is provided by this patent, a folda while a movable block has the position of the opposing teams indicated thereon, a series of dies indicating the different players, character of play and distances on the
field. It is designed that those who have played this field. It is designed that those who have played this game will be
on the fleld.

Design for Wrench Head.-Walter T. Johnston, Macon, Ga. This head has a rounding and transversely serrated top surface, one projecting end
presenting a bifurcation and the opposite projecting end presenting a bifurcation and the o
being concaved at the under side.
Nore.-Copies of any of the above patents will be furniehed by Munn \& Co., for 25 cents each. Please
send name of the patentee, title of invention, and date of this paper.

SLIENTIFIC AMERICAN
BUILDINGEDITION

## AUGUST, 1895.-(No. 118.

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A Colonial house at Scranton. Pa. Perspective ele G. W. Dietrich, architect, Nowplete $\$ 4,500$. E ple yet pleasing design.
A cottage at Reeidence Park, New Rochelle, N. Y Two perspective elevations and floor plans. Archi
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3. Perspective and floor plans of a Colonial cottage a South Orange, N. J. Built by H. E. Matthews
Orange, N. J. A neat design, with some nove Orange,
A Colonial house at Summit, N. J. Perspective el De Goll, New York Ci
5. A cottage in the suburbs of Brooklyn, N. Y., erected a cost of $\$ 7,500$ complete. Perspective elevatio and floor plans. Architects, Meesrs. J. C. Cady \&
Co., New York City. An artistic design. Co., New York City. An artistic design.
. Two perspective elevations and floor plans of "Lnv
er's Dell," a residence recently erected in New Jersag. A pleasing example for a modern Colonis dwelling. Architect, Oscar S. Teal, New York City.
. A residenee at Sea Side Park, Bridgeport. Conu. Two perspective elevations and floor plans. An ex quisite design.
Brideport, Conn
A residence in the Colonial style, recently erected
at Chester Hill, Mt.Vernon, N e elevations and floor plans. A Three perspect sign. Lewis H. Licas, architect, New York City. 9. Ground plan and perspective view of Holy Trinit Church, Harlem, N. Y.
Potter, New York City.
0. A residence at Montclair, N. J., being an additional May issue.
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ed.-Finishing floors.-Pompeian bath room.Seasoning of stone.- improvement in warm air water service system, illustrated.-An improved
door check and spring illustrated. oost uses.-The hollow handle glase cutter, illu trated.
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Walrus leather. suitable for making polishing wheels. Or sale by Geo. A. Brackett. 229 Congress St.. Boston. "C. S" metal polisb. Indıanapolis. Samples free. For best bolsting engine. J. S. Mundy. Newark. N. J. Presses \& Dles. Ferracute Macb. Co.. Bridgeton, N. mery Wheel Salesman Wanted. Morgan, care 3ci. Am Handle \& Spoke Mcby. Ober Latbe Co..Cbagrin Falls.O. Telescope for sale, Address J. W. Gray. Newark, Obio Screw machines, milling macmney, and drill presses
be Garvin Macb. Co., Iaikht and Canal Sts.. New Yort For Sale-Patent No. 28.533 oli or Ras stove. Sickne Racine. Wle.
Electro gold. sliver. nickel. brass, and bronze plater Waterbury Conn.
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Cider compound (Nictols) now readg sblpped any where. Dealers and others interested send for pa
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Tbe best book for electrcians and beginners in electricity is "Experimental Sclence," by Geo. M. Hopkins.
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Vew York. Free on application.

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HINTS TO CORRESPONDENTY. Names and $A$ dd ress must accompany all letters
or no attention will be paid thereto. This is for ou or no attention win be paid thereto.
1
 some answers require not a little research, and,
though we endeavor to reply to all either by letter

 personal rather than general interest cannot be
expected without remuneration.
cininitic American Suplements referred to may be and at the onfice Puplements referre
Books referred to promptiy supplied on receipt
price Minerals sent for examination should be distinctly
marked or labeled.
(6598) T. D. B. asks : 1. Will you please tell me the name of inclosed leaves and greatly oblige partment of Agriculture, informs ns that the leaf whic you inclose is that of the common poison ivy, Rhus rad
cans. 2. Please give formula and an exsmple of candle power due to increase of amperes in an incan escent lamp. A. An increase in the amperes will in rease the light of an incandescent lamp because both hea and light are determined by the power used by the lamp Electrical power is measured in watts, which are calc ated by multiplying the amperes by the volts. $\quad W=C E$ (1) A 16 candle power lamp should use about 60 watts
when the pressure is 115 volts. From formula (1) $w$ when the pressure is 115 volts. From formula (1) we
obtain (2) $C=\frac{W}{E}$ hence $C=\frac{60}{115}=0.52$ ampere. If in formula (1) C is made larger, the product CE become larger; that is, more power in watts is used and more the result cannot be gained in this way. With a civen amp and generator capable of lighting it, no variation in the amperes can be made. Ohm's law is $C=\frac{E}{R}$ amperes $=\frac{\text { volts }}{\text { ohms }}$ . Dynamos for incandescent lighting sually have a constant voltage, and the resistance of dynamo only varies as its speed may change, and the resistance of the lamp only changes by decreasing as the
flament grows hotter, or increasing as the lamp weary flament grows hotter, or increasing as the lamp wears
out; so that there ts ordinarily a uniform amperage passing in a lamp. To increase the light given by an incan creased. This should not be the current must be wear the lamp out too fast. A comparatively small increase of pressure will reduce the life of the lamp by a half. The with a lower resistance, that is, nith a shorter or larger lament. This is the method actually employed.
(6599) P. W. says: Please teN me through your paper: 1. What is celluloid composed of ? A. Cellaloid is a hard elastic compound made by subo. jecting gun cotion, camphor and other ingredients to hy draulic pressure. See our Supplement, No. 227 . lowers, so as to preserve their shape and color. A. A method of preserving the natural colors of flowers, recommended by R. Hegler io the Deutache Botanische Monatahefte, consists in dustling sallcylic acid on the plants as they lie in the prees, and removing it again with a brush when the flowers are dry. Red colors in particular are well prezerved by this agent. Another ution of 1 part of salic cylc acid in 14 of alcohol by means of blotiong paper or cotton wool soaked in it and placed above and below the flowers. Powdered boracic acid
yields wearly good resulte
Dr . Schandand, in the

Gardeners' Chronicle, recommends, as an Improvemen
In the method of using sulphurous acid for preservin in the method of using sulphurous acid for preserving
the color, that in the case of delicate flowers they might be placed loosely between sheets of vegetable parchment before immers
natural form.
(6600) J. D. writes : I am figuring on a refrigerating plant, to be operated by the use of com
pressed air, and would beg lad if you will state how cubic feet of alr, atmospheric pressure, at a temperature $20^{\circ}$, would be required to cool say one gallon of water o a temperature of $34^{\circ}$. the water being in a coil of pipe placed in a receiver into which the compressed air 18 ex dnded $o 1 / 2$ pound above amospheric pressure. Pleas dvise how many units of heat are contained in one gal heat in one cubic foot atmosphertc arr at $90^{\circ}$ and at $20^{\circ}$ A. The difference of $70^{\circ}-34^{\circ}=36^{\circ} \times 81 / 3$ pounds of wate per gallon equals 300 heat units. The specific heat of ir for equal weights with water 18 but 0.232 . and as 13 $=\frac{70^{\circ}}{13 c^{\prime}}=5^{\prime} \cdot 39 \times 0 \cdot 237=1 \cdot 27 \%$ heat units per cubic foot from $90^{\circ}$ to $20^{\circ}$. As the mean dufference of the water abo he air temperatures at its lowest point is $32^{\circ}$, then $\frac{{ }^{\circ}}{}$ $46 \times 0.237=0.583$ heat unit foreach cubic foot of air ex pended in cooling, and as 300 heat units are required
300 nen $\frac{300}{0.583}=514$ cubic feet of free air at $20^{\circ}$ to cool on allon of water from $70^{\circ}$ to $34^{\circ}$. See Scientific Ameri air."
(6601) P. B. V. says : Please give me dge. A. 1. Black:

## Sulphate of iron <br> Water

The hair must be thoroughly washed with this. drie ing should be applied on a small tooth comb, but sould not be allowed to touch the skin if the other pre Or 2,
Ga
 After the first application of formula 1. the bair should a allowed to dry and then be brushed. Subsequently, both formulx may be used once daily at an interval o
an hour or so, until a black color is produced. All pre parations of lead and mercury are injurious if nsed for any length of time: they may, however, be legitimately used where some small portion of hair has, from per sonal idiosyncrasy, lost its color, wheh cannot be re ( 602
(6602) F. and M. say : Have you receipt weet flavor? A. To Convert Rancid Butter.-1. 100 Water, containing $1 / 2$ pound of bicarbonate of soda and 15 pounds of fine granular animal charcoal free from dus and the mixture is cluurned together for half an hour קo. The butter is then separated; after standing, warmed
aud strained through a linen cloth, then resalted, colored and worked up with one-half ite weight of fresh butter. . To Sweeten Rancid Butter.-Rancid butter may be restored, or at all events greatly improved, by melting it with some freshly bnrnt and coarsely powdered animal harcoal (which has been thoroughly freed from dust by ifting) in a water bath, and then straining it through cean flannel. A better and less tronblesome method ext with cold spring water. Butyric acid, on the pres ence of which rancidity depends, is freely soluble in fresh milk.

TO INDENTORS
Anexperience ofnearly fitty years, and the preparation
of more ban onn nundred touasand appylicationg for Da-
tence at bome and abroad, enable us to understand the


INDEX OF INVENTIONS
Wor which Lettere Patent of the United States were Granted

August 6, 1895
AND EACH BEARING THAT DATE (See note at end of list about copies of these patents.)


 Coupink. See Air brake couping. Car coupling.

## Dead centers, device for overcoming, D. Seibert









 | 53.850 |
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| 54.034 |
| 543,865 |
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54,2800
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54,153


