ICE MACHINERY.

As an appropriate subject for the present hot weather, we sele t from Mr. E. H. Knight's "Mechanical Dictionary,"* the annexed engravings and following description of ice machinery. The apparatus illustrated depends upon the vaporization of water, ether, ammonia, benzole, etc., which, in assuming the vaporous form, change sensible heat into latent, extracting it from the reservoir of water, the contents of which are thereby congealed.

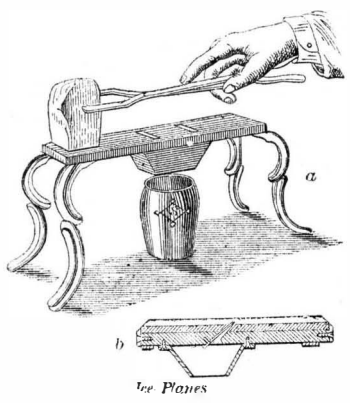
The Parisian restaurants have decanters (*carafons frappés*) filled with water frozen by placing them in shallow tanks of sea water, each of which is provided with a copper reservoir connected with a receiver filled with ether. The air is exhausted from the reservoirs by an air pump worked by steam, vaporizing the ether and reducing the temperature of the sea water and that in the decanters below the freezing point. The water in the decanters usually remains liquid until stirred with a glass rod, when it immediately congeals.

Edmond Carré's sulphuric acid freezing apparatus is upon this principle (shown at 1, Fig. 1), and is also used to make the *carafons frappés* so frequently seen in Paris. It consists of a large vessel, resembling the boiler of a steam engine, which is designed to contain the concentrated sulphuric acid; of an air pump with tube connections to be adapted to the wide mouths of the *carafons*, and of a mechanism by which the lever of the air pump is made to keep the acid in continual agitation. The great volume of the acid renders the loss of absorptive power by dilution very slow, and the constant agitation prevents the formation of a superficial dilute stratum, which would interfere materially with the success.

In 1, Fig. 1, *a* is the reservoir of sulphuric acid; *f*, a *carafon* of water connected by the tube, *r*, with the apparatus, and having a stopcock at *l*. *p* is the barrel of the pump, and *h* its lever, which also agitates the oscillator, shown in dotted lines.

Ferdinand Carré's intermittent apparatus, 2, Fig. 1, has a boiler containing the ammonia, connecting by the pipe, *r r*, with the refrigerator, *t*, which has a well in which is a pan containing the water, *z*, to be frozen. The boiler, *k*, is placed over a portable furnace, and the apparatus purged of air, which is driven by the evolved gas out at the stopcock, *m*. This being closed, and the refrigerator immersed in a tank of cool water, the temperature of the aqua ammonia is raised to 230° or 240° Fah., at which heat the ammonia is expelled and is condensed in a liquid form in the refrigerator, *t*. The boiler, *k*, being now removed from the furnace and placed in the water bath, the temperature of the water in the boiler will fall and the power of the water to dissolve ammonia will be restored. The gas will be rapidly re-dissolved, reducing the pressure, as the liquid ammonia will evaporate with corresponding rapidity, drawing for its latent heat upon the sensible heat of the water to be frozen. The result will be the complete evaporation of the liquefied ammonia and the restoration of an aqueous solution, in the boiler, of the original strength. Between the ice pan and the well is a body of alcohol, which will not freeze, but will act as a conductor. During the refrigeration, the vessel, *t*, has a non-conducting envelope.

Fig. 2.



Ice Planes

Ferdinand Carré's continuous process, shown in the three other views in Fig. 1, depends also for its efficacy upon the evaporation of liquid ammonia. *a* is the boiler, exposed to the heat of the furnace, *b*; *c* is an indicator to show the level of the liquid; *i* is a tube conducting gas to the liquefier, *j*; the vertical pipe above the branch, *i*, leads to a safety valve, and any escaping gas passes by pipe, *c*, to the water tank, *c'*, where it is absorbed. *f* is a tube which brings back to the boiler saturated solution of ammonia from the absorbing apparatus, *u u*; this solution passes downward, trickling through the perforated trays, *g*, while the ascending gas rises in a sinuous course alternately around the edge of one tray and through a central hole in the next, and so on. This condenses and carries back the watery vapor which accompanies the gas.

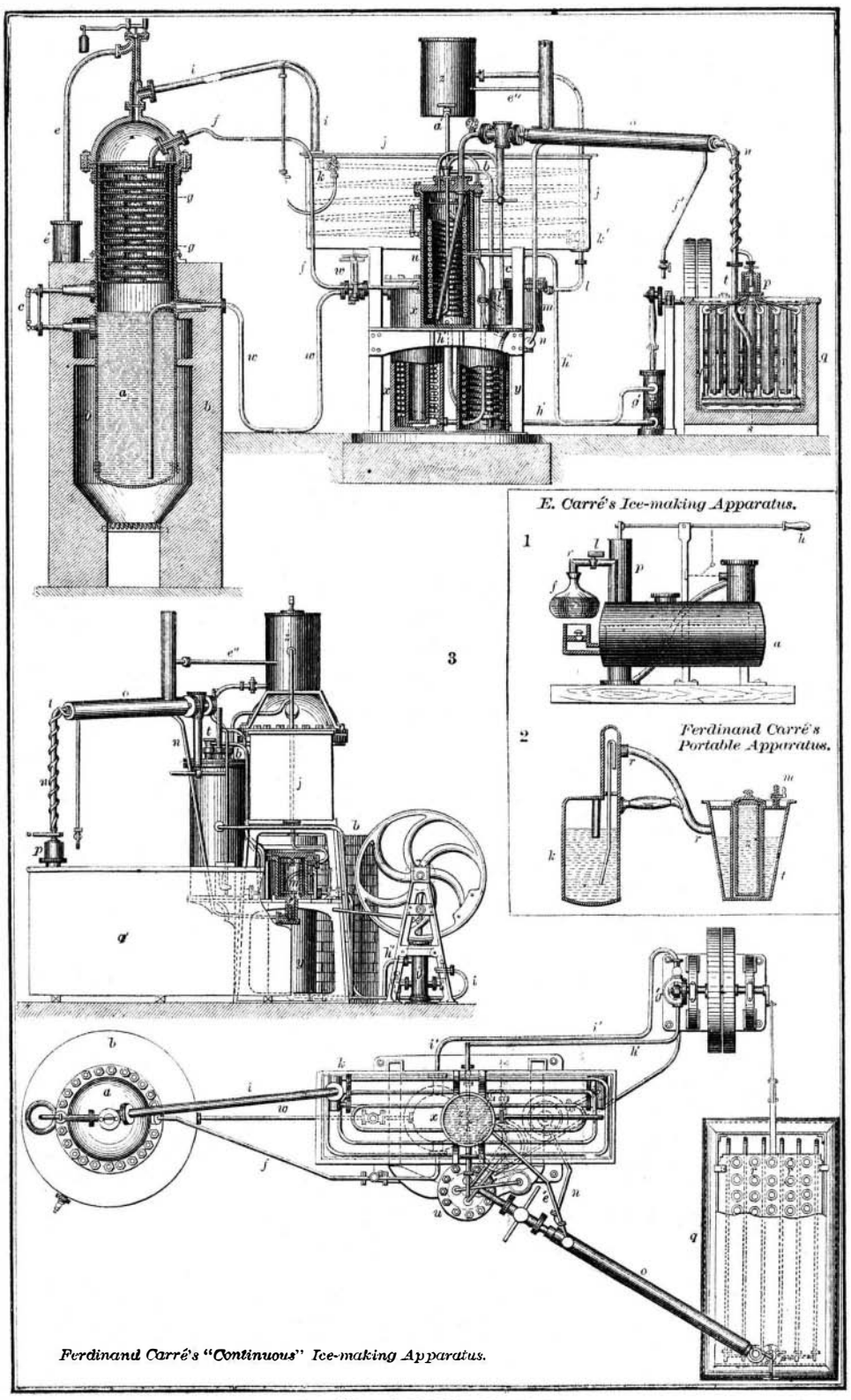
The gas passes by tube, *i*, to the liquefier, *j*, passing through a box, *k*, and a series of zigzag and spiral tubes in a bath of cold water constantly renewed from reservoir, *z*, which also supplies other parts of the apparatus. The tubes terminate in another box, *k'*, and the ammonia is by this time in a liquid state under the pressure of 10 atmospheres, which is constantly maintained in the boiler. In the liquid state the ammonia passes by the pipe, *l*, to the efflux regulator, *m*, which is the dividing barrier between the part of the machine in which a regular pressure of 10 atmospheres is maintained and the following part where the pressure does not exceed 1¼ atmospheres. The regulating device is a floating cup which opens or closes a hole of influx.

The liquid passes from the regulator, *m*, by pipe, *n*, to the distributor, *p*, the pipe, *n*, being wound spirally around the tube, *t*, through which the vaporized ammonia is returning from the refrigerator, *q q*, the vapors serving to reduce the temperature of the liquid in *n* before it reaches the refrigerator.

The refrigerator itself consists of a number of zigzag or spiral tubes—in the apparatus here represented, six in all—immersed in a tank constructed of non-conducting substances. Each one of the six zigzags receives an equal supply of the liquid ammonia from the distributor. The small tubes conveying this supply are shown at *p*. The vessels, *r*, to be refrigerated are sustained on a carriage, which is slid back and forth by the same power that works the pump, *g'*, by which the re-saturated solution of ammonia is returned to the boiler. The space in the tank surrounding the zigzags and the water vessels, *r*, is filled with an uncongelable liquid, such as alcohol or a solution of chloride of calcium. The ammonia in the zigzags, *q*, discharges in a vaporized form into the collector, *s*, and passes through the tube, *t*, to the cylinder, *u*, where it extends nearly to the bottom of the vessel, and there discharges the gas into the water which has been brought from the bottom of the boiler, *a*, and partially fills the cylinder, *u*. From this water the ammonia has been nearly exhausted, and it therefore greedily absorbs the gas ejected into it by pipe, *t*. On the left of vessel *u*, is a water level indicator. Within the vessel, *u*, is a worm which receives water by pipe, *a'*, from the elevated reservoir, *z*; after passing to the bottom of the spiral, the pipe curves upward and then (marked *b*) descends nearly to the bottom of the vessel, *y*, where it discharges.

The water from the boiler, *a*, passes by pipes, *w w*, to the coolers, *x y*, before reaching the vessel, *u*, where it re-absorbs ammonia. Between the boiler, *a*, and the vessel, *u*, the water is cooled so as to fit it for absorbing gas more freely. The pressure in the boiler is sufficient to expel it when the stopcock, *w*, is opened. The vessel, *x*, is formed of two concentric cylinders, between which are two spiral tubes formed of the pipe, *w*, continued, and these spirals are immersed in a liquid which fills the annular space between the cylinders, and is the reconstituted ammoniacal solution on its way from the absorber, *u*, to the boiler, *a*. From *x*, the water in the spiral is conveyed in the pipe, *w*, still continued in a single spiral ascending in the vessel, *y*, and continued further in a pipe, *w*, alongside of the absorber, *u*, into which it discharges into a sieve, *v*, and from which it descends in a shower.

Fig. 1.



Ferdinand Carré's "Continuous" Ice-making Apparatus.

CARRÉ'S ICE-MAKING MACHINES.

The exhausted solution from the boiler, *a*, flows freely, as has been said, from the boiler, by pipe, *w*, to the absorber, *u*, passing the coolers, *x y*, as described; but it requires some power to force the reconstituted solution back from the absorber, *u*, through the pipe, *f*, to the boiler. This power is a pump, *g'*, driven by a steam engine or other motor, and taking the saturated solution from the absorber by pipe, *h'*, and discharging it by pipe, *i'*, into the vessel, *r*, whence it passes by pipe, *f*, to the dome above the boiler, as described previously. Gas finding its way into the pump is discharged into the upper part of *n*. *e''* is a pipe leading to the enveloping tube, *o*, whence water is conducted by *f'* for the use of ice vessels, *r*. As the water passes through *o* it is cooled by the ascending vapors of ammonia.

In starting the machine, it is first blown through to expel the air. The air escaping from the vessel, *u*, passes by pipe, *c*, to the purger, *d*, and passes beneath the surface of the water therein, which retains any escaping ammonia.

Fig. 2 is an

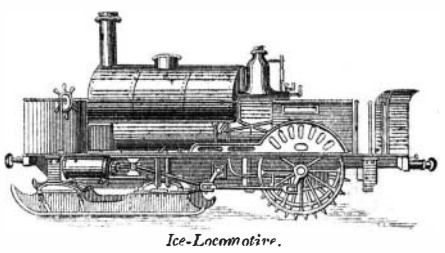
ICE PLANE

for shaving off fragments of ice for cooling drinks. It consists simply of a couple of plane knives inserted in a board, over which the ice is drawn. The shavings fall through the apertures beside the blades and into the vessel placed below for their reception. An interesting device, which we may here add, since it is connected with the subject of ice, is an

ICE LOCOMOTIVE

or traction engine, for running on ice (Fig. 3). It was constructed by the Messrs. Neilson, of Glasgow, Scotland, and employed for carrying passengers and freight between St. Petersburg and Cronstadt, Russia. It has two driving wheels, each 5 feet in diameter and studded with spikes. The front part rests on a sledge, which is swiveled and may be turned by the wheel which has an endless screw, working a pinion that turns a segment rack attached to the sledge body. The cylinders are 10 inches in diameter and of 22 inches stroke. The weight of the engine is 12 tuns, and it is said to have attained a speed of 18 miles per hour on the ice.

Fig. 3.



Ice-Locomotive.

*Published in numbers by Messrs. Hurd & Houghton, New York city.

Mineral Manures for Potato Blight.

Just now, when chemical fertilizers are creating so much attention, it is of interest to note that Mr. Charles T. Hayward, of England, as we learn from the *Journal of Horticulture*, has apparently succeeded in preventing potato blight, by supplying the mineral elements of potato plant food to his garden, which had previously been well dressed with nitrogenous manures. He claims to have secured a better crop, the tubers more even in size, smooth skinned, and free from disease; while the market gardeners about him suffered heavy losses from the potato disease.

Cellulose.

Dr. Mitscherlich, of Darmstadt, has devised a method of making paper stock (cellulose) from wood by a chemical process, which differs somewhat from those previously in use. The chief peculiarity of this process, which is in use already in Prussia and Saxony, says the Hesse *Gewerbeblatt*, consists in this, that the incrusting substance of the wood is not destroyed, but only separated from the cellulose, and eventually rendered soluble.

In this process, it is not necessary to cut the wood up very fine, as in the Sinclair process, but only to split it up like ordinary firewood for a parlor stove. A chemically prepared solution of lime is boiled for six hours with the wood under a pressure of 3 atmospheres. After the boiling, a portion of the incrusting material is found dissolved in the liquor, and part of it in the pores of the wood, from which it is extracted by a suitable squeezing apparatus.

If it is desired to make a very valuable paper stock, which shall be as white as possible without bleaching, they only employ white wood as free from rosin as possible, like poplar, linden, etc. These kinds of wood are not decolorized any farther in this process, and the albuminoid and gummy substances are mostly dissolved. The success of this process depends less on the pressure during boiling than on the temperature, which must not exceed 248° Fah.

The use of oak wood for paper stock offers one advantage, namely, that the tannin contained in it is obtained as a by-product, and the solution thus obtained can be very profitably employed for tanning, as experiments in this direction have abundantly proved. The solution which runs off from the wood, or expressed from it, in this new process, is already so concentrated that evaporation seems superfluous, and is only undertaken when a very concentrated solution of tannic acid is required either for transportation or for keeping. The other chemicals contained in the lye are in no way a hindrance to thet anning process, but rather aid it. Experiments show that hides prepared in the usual manner, when simply laid in this liquor, were perfectly tanned in ten days.

NEW BOOKS AND PUBLICATIONS.

THE ANDES AND THE AMAZONS, or Across the Continent of South America. By Professor James Orton. Third Edition, revised, and enlarged, with Maps and Illustrations. New York city: Harper & Brothers.

In 1867, Professor Orton set out on his first journey across Equatorial South America, and the record of his travels is embodied in the first edition of the present work. In 1873, he made a second expedition, and navigated the Amazons from Para to Yurimaguas, thence over the Andes to the Pacific coast and down to Lima. The main objects of the journey were scientific, and they included a special study of the Marañon region, of which little has hitherto been known, besides the collection of facts illustrating the commercial resources and possibilities of the Valley of the Amazons. We need hardly say that Professor Orton has accomplished his task thoroughly and well, for our readers are already familiar with portions of his journey through the admirable letters which he forwarded to the SCIENTIFIC AMERICAN from many interesting points along his route. Those who have read these fascinating recitals, and desire to know more of the strange region which they describe, will gladly welcome the present volume, in whose copious pages details, necessarily abbreviated in the newspapers, are presented in full. The illustrations are excellent and lavishly supplied. By them, and together with the two large maps added, the reader cannot fail to realize the journey so lucidly described by the author.

Recent American and Foreign Patents.

NEW WOODWORKING AND HOUSE AND CARRIAGE BUILDING INVENTIONS.

IMPROVED DUMPING CAR.

David Manuel, Readville, assignor to himself and Ezra G. Perkins, Hyde Park, Mass.—This consists of a body supported on rockers, which work on rocker beds mounted on the perch of the car, and having links so connected with the rockers as to allow them to work freely, and at the same time keep them on the rocker bed; and it also consists of a contrivance of the brakes to swing together with the wheels.

IMPROVED STENCH TRAP.

Edward F. Hutchins, Toronto, Canada.—In order to so improve the metallic stench trap in common use that the bursting of the same by freezing is avoided, and that the detaching of the trap for cleaning or melting the ice may be readily accomplished, this inventor proposes a stench trap made of an elastic material, connected in a detachable manner to the pipes.

IMPROVED VELOCIPEDE.

R. Walcot Laurence, New York city.—This invention consists in mounting the steering wheel on the reach of a lever pivoted to the seat and arranged in an axle guide, extended forward to the foot rest. It can be worked by the feet to guide the carriage while the propelling power is applied by hand, and the carriage can also be guided by the driving wheels by turning one faster than the other.

IMPROVED METALLIC ROOFS.

Francis C. Conklin, Monroe, N. Y.—This consists in the combination, with a shingle roof, of strips often extending from peak to eaves, also strips nailed at the butt of each row of shingles, and a wood strip arranged along the margin and edge of the two strips. The latter are similarly connected by hooked flanges.

IMPROVED FLOOR CLAMP.

William S. Spink and Wilber Mason, Providence, R. I.—This consists of a grooved base piece, with floor entering knives, a ratchet slide piece, and an operating lever, together with moving and locking pawls. The operating pawl has a tap pin that releases the locking pawl when the slide piece is to be carried back.

IMPROVED FASTENER FOR THE MEETING RAILS OF SASHES

George Edwards, Brompton Road, South Kensington, England.—This improvement serves to facilitate the disengagement of the devices previous to moving the sashes. It is also provided with means for drawing together the adjacent edges of the two sashes, to prevent rattling and exclude drafts. It is a simple and ingenious spring bolt, having a screw attachment whereby the sashes may be drawn together.

IMPROVED PLASTERING LATH.

Theophilus A. Scheller, Marysville, Cal.—This is an improved plastering lath, by which the plastering is firmly held without danger of dropping and without the use of hair or other binding material. It has dovetail mortises cut into the wood.

NEW AGRICULTURAL INVENTIONS.

IMPROVED ANIMAL TRAP.

William Wallace, Tarrytown, N. Y.—The stationary and movable jaws are pivoted together, and extend above the pivot a suitable distance to be closed quickly by a strong string. The stationary jaw has an extension forming a stake, by which the trap may be set up in the ground; also an arm on which the trip for setting and springing the trap is pivoted. The other jaw has a catch for hooking the trip. A lever, on the upper end of which the trip is formed, extends downward to the point where the jaws are to gripe the animal, and carries a yoke to be set in the runway, so as to be moved by the animals in attempting to pass under it.

COVER FOR THRASHING MACHINE TUMBLING RODS.

William R. Wilcox, Sterling Center, Minn.—This cover for the tumbling rods of thrashing machines will allow the knuckle joint to be oiled without removing the cover.

IMPROVED LAND ROLLER.

Fredus B. Hadley, Monterey, Ill.—This consists of an improved land roller, made hollow, and provided with ribs or flanges upon the inner surface of its shell and the heavy inner cylinder.

IMPROVED GRAIN SEPARATOR.

David E. Fisher, Patterson, Ohio.—For operating or shaking the screen shoe, a differentially ribbed and eccentrically mounted revolving cam is employed.

IMPROVED WEANING BIT.

Philip Heak, Toledo, Iowa.—This consists in the hollow bit having a V bend formed in its middle part, and perforated with a number of holes, and provided with the rigid arms. The rigid attachment of the arms prevents the bit from turning in the animal's mouth and getting into such a position as not to be effective.

IMPROVED PLOW.

Robert Cassidy, Thomas R. Lamb, and Chauncey L. Vaughan, Beloit, Kan.—This improved plow is without side draft, and of lighter draft than ordinary plows, and may be readily adjusted to run deeper or shallower in the ground, and to take more or less land, as may be desired. The plowshare is of special form, and has the cutting edge at right angles with the land side. It is combined with a slotted standard, curved inwardly to bring the plow beam nearly over the center of the share.

IMPROVED WHEEL PLOW.

William A. Ruddick, Carthage, Mo.—This improvement consists of an A frame mounted on the plow beam transversely with a caster wheel on the apex of the frame, to run on the land. There is a larger wheel at the end of one of the bars of the frame, and a tongue connected with the base of the frame. Wheels are contrived for raising and lowering at will to adjust the plow for furrows of different depths, and for carrying the plow above the ground.

IMPROVED PLOW.

David H. Jarrard, Talladega, Ala.—This plow is so constructed that the plow standard may be adjusted to give any desired pitch to the plow, and may be held securely in place when adjusted, and which will support the wing of the plow plate to prevent it from being bent or broken.

IMPROVED MOWING MACHINE.

Charles B. Martyn, Waupun, Wis.—This improves the construction of reapers and mowers in such a way as to convert the long and unequal stroke of the connecting bar into two short and equal strokes of the sickle with a motion of uniform velocity.

IMPROVED BUTTER WORKER.

Charles Plyer, Hempstead, N. Y.—This invention consists of a concave dish with raised center, to which a swinging lever, of a shape corresponding to the dish, is swiveled. This is to be worked all around the dish for cutting up the butter.

IMPROVED GRAIN HEADER.

Charles K. Myers and John W. Irwin, Pekin, Ill., assignors to said Myers and Peter Weyrick, same place.—The object here is to improve the construction of grain headers, so that the reel may be moved farther from and closer to the cutter bar automatically as the cutter bar is raised or lowered to operate upon taller or shorter grain. The device includes five new mechanical constructions.

NEW TEXTILE MACHINERY.

MECHANISM FOR OPERATING TAKE-UP ROLLERS FOR KNITTING MACHINES.

Ira Tompkins and Albert Tompkins, Troy, N. Y.—This consists of the tension spring employed to regulate the tension of the cloth interposed between the crank rod and the rod for working the take-up pawl lever. It is so arranged that when the machine does not deliver cloth for any reason, as when not making stitches, the spring will compress and allow the crank rod to work its regular course, while the pawl lever will be held by the tension of the cloth until the cloth is delivered from the machine again.

IMPROVED SELVAGE GUARD FOR LOOMS.

John H. Mills, Lisburn, Pa.—This is a wire finger, with a spring lever fitted to a little block, to be so attached to the loom temple that the finger projects down past the selvage at the point where the filling is beaten up, so that the shuttle draws the filling around said finger until it arrives at the box at the other side. The reed then strikes the spring lever, and raises the finger out of the loop after the shuttle enters the box. The guard moves along with the temple relatively to the cloth, so that it is always in the right position. There is a guard on each side for each selvage. The object is to make the selvage more uniform and regular than it is ordinarily made.

IMPROVED HOSE GOODS.

Henry G. Hubbard, Middletown, Conn., assignor to Russell Manufacturing Company, of same place.—The invention consists in an improved hose goods, having one or more selvages upon one edge, and two or more upon the other edge, to interlap with each other in forming the seam.

NEW CHEMICAL AND MISCELLANEOUS INVENTIONS.

IMPROVED REED ORGAN STOP ACTION.

Henry Smith, Gananoque, assignor to himself, Joseph George, and Charles Mee, Kingston, Canada.—This consists of a cam lever, pivoted to the key board, and connected to the stop, and so arranged as to act directly on the valve or mute, making a simple and cheap contrivance.

IMPROVED INHALER.

George L. Crosby, Hannibal, Mo.—This invention consists in combining a glass stopper, having an acid receptacle and air passages, with a grooved stopper and tubes. From the acid receptacle the fumes are drawn down through a tube into the liquid in the body of the inhaler, to be inhaled through a flexible tube.

IMPROVED FAUCET.

Patrick Skelly, New York city.—This relates to improvements in faucets for barrels of all kinds, that a tight seating of the stop-cock without leakage, and a superior and readily applied coupling with the liquid-conveying pipe, are obtained.

IMPROVED SOAP FRAME.

Daniel Whitaker, Boston, Mass.—This soap frame can be conveniently set up and taken down, and its side and end plates are more firmly connected than others of its class. The base of the frame is made in three parts, secured to each other by transverse screw bolts, whereby they are adapted to enter grooves in the base of frame, and are attached thereto by hooks and staples. The end portions of the frame have clamping bars attached, whereby they may be locked to the sides, in such a manner as to hold the ends vertical, and form a tight joint between them and the sides; and lastly, the side portions of the frame are provided with truss-like braces, whereby they are prevented from buckling, warping, etc.

IMPROVED END FASTENING FOR SUSPENDERS.

John H. Murfey, New York city.—A clip of sheet metal is contrived for fastening one or two ends to the buckle, hoop, loop, or other device, for connecting the end to the principal strap. The said contrivance is such that the clip can be made by stamping or punching it out at one blow of a press, and can be fastened on the strap without sewing, riveting, or other means required to puncture or slit the end.

IMPROVED HARNESS CLAMP.

James McCormick, Glidden, Iowa.—This consists of rubber-faced metal plates for attachment to the jaws of harness makers' sewing clamps, to hold the leather to be sewn without injury to it, and, at the same time, firmly. The said plates are constructed with a groove in the face side, which receives the rubber facing, and holds it without other fastenings.

IMPROVED EVAPORATING PAN.

Sydney S. Connor, Amite City, La.—This consists in an improvement in evaporating pans by providing them with detachable partitions having angle bars to make tight connection with the bottom.

IMPROVED PEDAL ATTACHMENT FOR CABINET ORGANS.

Benjamin L. Boomer, Campello, Mass.—This is a contrivance for closing up the opening in the front of the case for the pedals, and fastening and unfastening the panel which closes it by the desk. The object is to make a better and neater appearance, and protect the instrument from dust, mice, etc.

IMPROVED STOPPER FOR SHIPS' RUNNING GEAR.

John W. Knight, New York city.—The object of this invention is to prevent the chafing and wear of the sail of a vessel from the rope or buntline by which it is drawn up; and it consists of a stopper attached to the mast or any part of the rigging by which the rope is held, so that it will hang loosely over the sail, and so that when the fall of the rope is hauled in, it will let the rope go free.

IMPROVED METAL TOY.

William A. Harwood, Brooklyn, N. Y.—This improvement in toy horses consists of a contrivance of the support by which the horse is mounted on the wheels, so as to be elevated and to make a stronger support than is now used, and yet employ less metal to do it. It consists of a narrow strip of metal or wire, bent so as to make a light support, and at the same time stiffen the metal.

IMPROVED BREECH-LOADING FIRE ARM.

Ira M. Earle, Guilford Center, Vt.—This consists of a hammer contrived to explode the cartridge and close the breech at the instant, the said hammer moving as the radius of a circle, and forming, with the housing, arcs of concentric circles, in such manner that it bears at all times the same relative position to the solid housing, which supports it in its rear, and sustains the shock of the explosion. The hammer cannot explode the cartridge till it is in position to close the breech. The invention also consists of the shell extractor, so arranged that it is operated by slight extension or continuation of the thumb pressure in the motion of cocking the piece.

IMPROVED COUNTER STIFFENER FOR BOOTS AND SHOES.

George W. Simpson, Federalsburg, Md.—This consists in a skeleton counter or back stay made of spring steel, and consisting of the parallel bars and the cross bars, having their projecting ends bent inward to adapt it to be applied to boots and shoes. Its object is to prevent boots and shoes from being run over at the heel.

IMPROVED FISH TRAP.

James McRoberts, Toledo, Iowa.—This is an improved trap for catching fish at the outlet of lakes and ponds, and in other places so constructed as to prevent the escape of the fish within the trap when another fish is entering, and to prevent the smaller fish from being destroyed by the larger ones.

IMPROVED ARTIFICIAL FLOWERS.

Mrs. Eliza F. Penley, Brooklyn, N. Y.—This consists of flowers, leaves, and other articles cut of layers of rattan pith or other wooden strips, wound in continuous strands or coils and cemented together, the leaves being attached to a suitable stem.

IMPROVED PASSENGER REGISTER.

William Mehan, Hoboken, N. J.—In the doorway of a car is pivoted a vertical shaft to which a turnstile is attached. In the floor of the car beneath one side of the stile is placed a weighted platform, of such a size that the passenger cannot step over it. A set of ordinary registering wheels is so arranged as to turn the first wheel of said register through the space of one tooth at each depression of the platform.

IMPROVED LETTER BOX.

France Iersche, New York city.—This consists of a letter box with two or more downward inclined letter spaces, with slotted bottom parts, so that the letters may be seen through the openings in the doors of the adjoining boxes below.

IMPROVED BALE TIE.

Beall Hempstead, Little Rock, Ark.—This improvement consists in a buckle slotted at one end so as to allow the bale band to be fastened thereto by simply bending it around the same, thereby economizing bands; and having at the other a button upon the under side, having two extensions, one of which is larger than the other, which button is adapted to pass through a slot in the other end of the bale band and thus secure the band around the bale. The button may occupy any position with respect to the buckle, and the arrangement is such that to loosen the band the buckle must be brought to a position that the strain of the band will not naturally allow it to assume, thus insuring a secure fastening.

IMPROVED FAUCET ATTACHMENT.

Harry L. Sadler, Brooklyn, N. Y.—This invention consists of a screw threaded bushing of the faucet hole, in connection with an interior tube, having recesses, and a wooden closing plug. The plug tube has interior projections, that are engaged by lugs of a hollow and threaded key that screws into the bushing and carries in a socket with wooden lining, the faucet, opening or closing the keg by the insertion or withdrawal of the faucet key.