

guard, made in the form of a sleeve, that slips over the barrel and forms a non-heat-conducting cover. By the use of this guard the gun barrel may be firmly held in the hand even after it has become scorching hot under rapid firing.

Samples of these devices are furnished by Mr. Joseph Dixon, 7 Bloom Grove, Lower Norwood, London.

Professor Loomis' New Meteorological Deductions.

Professor Elias Loomis of Yale College, after examining the immense number of weather observations collected by the United States Signal Service, deduces the following generalizations. The seven papers wherein the detailed discussion has been embodied have appeared in the *American Journal of Science and Arts* whence the summarized conclusions below given are extracted:

1. Areas of low barometer result from a general movement of the atmosphere towards a central area, and this movement is accompanied by a deflection of the wind to the right, which causes a tendency to circulate around the center with a motion spirally inward.

2. This deflection to the right, which results from the earth's rotation, causes a diminished pressure within the area of this inward movement, and the pressure is still further diminished by the centrifugal force resulting from the circulation about a center.

3. The amount of the barometric depression depends upon the force of the wind, and the geographical extent of the revolving atmosphere. The effect of centrifugal force is not considerable except when the velocity of the wind approaches that of a hurricane. With a velocity of 100 miles per hour, the depression due to centrifugal force may amount to about two inches; but in the winter storms of the middle latitudes, with a velocity not exceeding forty miles per hour, the depression due to centrifugal force seldom exceeds one or two tenths of an inch. In these storms, three quarters of the observed depression of the barometer is usually the effect of the earth's rotation: but in order that the depression at the center may amount to as much as one inch, it is generally necessary that this system of circulating winds should prevail over an area nearly 2,000 miles in diameter.

4. In North America, south of latitude 35°, areas of low pressure are less frequent and generally exhibit a less depression than near latitude 45°, because the area over which a cyclonic movement of the winds prevails is small; and this area is small because, if a cyclonic area could be formed having a radius of 1,000 miles with its center in latitude 30°, its circumference must extend southward to latitude 16°, where the trade winds are steady and seldom interrupted. Such a diversion of the winds toward the north, even if it could be produced, could not be long maintained; so that a large cyclonic area with its center in latitude 30° is well nigh impossible; and it is impossible that there should be a great depression of the barometer in latitude 30°, except with a wind having a hurricane velocity. This is believed to be the reason why in North America the centers of great storms are generally found north of latitude 40°.

5. The causes which may produce a general movement of the atmosphere toward a central area are (A) unequal pressure as shown by the barometer; (B) unequal temperature; and (C) unequal amount of aqueous vapor. Of these three causes the effect of the first is generally so decided that the influence of the other two causes can only be detected by careful observation; but when the pressure of the air is nearly uniform over a large extent of country, the influence of the other two causes is sometimes very palpable, and their influence is generally seen in a slight deflection of the winds from the direction they would have if wholly controlled by the first cause.

6. A cyclonic movement of a large mass of air is generally attended by an upward motion in certain localities, chiefly on the eastern side of the center of low pressure, and this upward movement results in rainfall. The rainfall is then not generally the original cause of the barometric depression, but rather an incident of the cycloidal movement of the atmosphere. The fall of the barometer during a rain storm cannot be ascribed to the simple condensation of the vapor of the atmosphere, as some have supposed, since a rainfall of one or two inches prevailing over an area 300 miles in diameter near latitude 30° produces scarcely an appreciable effect upon the barometer.

7. The progress of areas of low barometer in all latitudes is determined mainly by the same causes which determine the general system of circulation of the atmosphere; and their normal direction is changed by whatever causes may change the direction of the winds.

8. The heat which is liberated in the condensation of a large amount of aqueous vapor must exert an influence upon the movements of the air, so that while the rain is generally to be regarded not as the original cause but rather as one of the incidents of extensive cycloidal movement, if the rain area has great geographical extent, it may have a decided influence upon the amount of the barometric depression and upon the velocity with which the storm advances; sometimes accelerating its motion, sometimes retarding it, and sometimes holding it nearly stationary in position for two or three days.

The Electric Light.

The Russian Government, it appears, is turning its attention to the electric light as an illuminator for military purposes. In some experiments recently made at St. Petersburg, with the special object of increasing the distance to which the light produced by electricity may be thrown, it

was found that the power of the light is greatly augmented by covering the carbon burner with a thin sheet of copper. The augmented light was sufficiently powerful to render objects visible at night at a distance of upwards of 3,000 yards.

Professor Langley's Apparatus for Eliminating Personal Equations.

A well known source of error in astronomical observations is that due to the deficiencies of the observer himself in the shape of defects in vision, perceptive power, etc. In order to eliminate this, astronomers have adopted two courses; either to find the amount of personal error in each case and apply a subsequent correction, or to diminish or eliminate the same by suitable devices during the act of observation. Professor S. P. Langley describes, in the *American Journal of Science and Arts*, and new and very ingenious apparatus for eliminating the "personal equation" on the star itself. It is constructed and operated as follows:

On the transit pier (or in any other convenient locality) is a small clock, with a conical pendulum, whose bob slides freely up and down the graduated rod, retaining its position where left. A small horizontal wheel in the clock is controlled by the pendulum, and turns once for a certain constant number of its revolutions. This wheel revolves once for each equatorial interval of the transit wires, when the bob is set at a mark near the top of the rod, and by sliding the bob sufficiently downward; with the use of a readily constructed table, we can, given the declination of any star between the limits 0° and ± 60°, set the pendulum, so that this wheel shall make exactly one revolution while the star passes from wire to wire. This wheel carries near its periphery a mercury drop or other contact piece, which once in a revolution is carried past a point fixed near the periphery of a stationary horizontal wheel, concentric with the first, and immediately above it, but insulated and entirely detached from it.

This upper wheel, while thus related to the lower, is entirely disconnected from the machinery of the clock, and is thus far stationary; but it can be revolved by cords passing from a groove in its circumference to the hand of the observer at the transit. As the upper, or ordinarily fixed, and the lower or constantly moving, wheels have a common vertical axis of revolution, and as the radial distance of the point in the upper from this axis is the same as that of the contact piece on the lower, it will be seen, while the upper wheel remains motionless, electric contact accompanied by a simultaneous flash, if we desire it, at the transit lantern or elsewhere, will be made at equal and uniformly recurrent epochs, the interval between which depends only on the adjustment of the pendulum. If the upper wheel be rotated forward by hand, through a small distance, and then left, the next contact will still occur, but at a later epoch, owing to the lower wheel's having to complete more than one revolution to make contact, but after this the contact and simultaneous flash will recur at the same intervals, and with the same regularity as before. If the upper wheel be moved backward, the flash will occur once, earlier, and thereafter with regularity. Moving the upper wheel, then, changes the epoch from which any series of such flashes dates, and adjusting the pendulum bob fixes the interval between subsequent flashes. In practice the lamp is removed from the transit lantern, and the two terminals of a battery or induction coil in its place cause the flash to be thrown upon the wires, whenever the mercury drop is in contact with the point, and at the same instant a mark is made automatically on the chronograph and interpolated in the regular record of the beats of the sidereal clock, which go on in the usual way quite independently of any reference to the apparatus just described.

The mode of observation will be anticipated. Before the transit of any star the observer adjusts the conical pendulum beside him (this is the work of but a few seconds), and then seats himself at the instrument holding the cords in one hand like the "reins" of an equatorial. If a flash occur just as a star is crossing the first wire (which is most unlikely) he has nothing to do, except possibly to note which was the middle wire, for each records itself on the chronograph without any intervention of his. But if the star be, for instance, two thirds of the way from the first to the second wire at the first flash, he will draw one of the cords, accelerating the flash and thus causing the star to appear nearly coincident with the second wire when the next spark comes, and repeat the adjustment by the light of subsequent flashes, till the bisection is perfect. Three or four trials are in practice found to yield a bisection which will satisfy a fastidious eye, and when a satisfactory one has been once made, the effect is automatically repeated.

Under the general conception, then, of the possibility of diminishing to any limit personal error, by employing brief views of the star or wire and utilizing the phenomena of persistence of vision, the particularly described device assumes to dispense with the observer's record upon the chronograph altogether, and to substitute a purely automatic one giving the same virtual result as though the image of the star were a tangible object, itself making electric contact with each wire. The share of personality in any observation is relegated to the prior act of bisecting a star, virtually motionless with relation to the bisecting wire, so that if (as seems to be the case) this act is independent of quickness or slowness of perception, of the time of cognition, or of the speed of nerve transmission; personality, in the technical sense, appears not to intervene at all.

Recent American and Foreign Patents.

Notice to Patentees.

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NEW HOUSEHOLD INVENTIONS.

IMPROVED SAD IRON AND FLUTING IRON COMBINED.

Christopher C. Burke, Cuthbert, Ga.—This improvement consists in forming the iron in box form with four smoothing faces, two large ones and two smaller ones, and combining it with a handle in such a manner as to be reversible, and with a heating plug or block to be inserted in the hollow iron which has four faces, corresponding to the four faces of the iron. It also consists in the particular means for connecting and disconnecting a plate carrying one of the ironing faces, to admit the insertion or removal of the plug or block, and the adjustment of a fluter.

IMPROVED RECIPROCATING CHURN.

Allen D. Ferris, Blakeley, Minn.—This invention relates to oscillating churns; and the nature of the invention consists in combining, with a semi-circular cylindrical oscillating churn box, a removable rectangular frame, having slats arranged in it in such manner that when the box is rocked rapidly the milk in it will be violently agitated, the currents being directed upward and downward by reason of the position of the dashers or slats. The slats on one side of the frame are inclined in an opposite direction to those on the other side of the frame, and the angle of inclination of the slats is such that the milk is directed both upward and downward by the same slats at each oscillation of the churn box. The currents are thus opposed to each other, and a violent agitation is produced which greatly shortens the operation of churning. The slats also serve to gather the butter when it comes.

IMPROVED COMBINED LAMP REST AND SHADE HOLDER.

Patrick J. Clark and Joseph Kintz, West Meriden, Conn.—This invention relates to an improved lamp rest and shade holder combined, by which the shade may be readily swung out of the way, and securely retained in raised position while the fount is taken off for refilling and other purposes, the fount being securely applied to the fount plate or basket, and any danger of upsetting or dropping the lamp effectually prevented. The invention consists in the connection of the lamp fount, having a central cavity, with a spring wire holder or clamp that screws the fount or basket tightly to the bracket or chandelier; and it also consists in the connection of a fount plate or basket with an adjustable rod carrying the swinging shade holder. The fount when placed on the spring wire holder is rigidly retained on the plate or basket without danger of being thrown off or detached from the same in accidental manner. The wire holder admits at the same time the ready sliding of the fount when lifted in vertical direction, for clearing, refilling, etc., and the instant replacing by pressing the fount down on the holding device. The shade or chimney is swung back on the fount as soon as the same is placed in position on the holder, being securely supported in raised position as to remove and replace the fount and light the lamp in convenient manner.

IMPROVED BROILER AND TOASTER.

Andrew C. Bolton, Greenport, N. Y.—This invention consists of two light wire frames hinged together, and provided with a spring fastening and with a wooden handle. The object of the invention is to provide a simple and efficient device for holding meat or bread over the fire while broiling or toasting. The frame is formed by bending a wire into a rectangular form, and twisting it together at the center of one of the sides of the frame. This frame is stiffened and supported by two wires which pass through the first twist of the wire that forms the frame. The wires that diverge from this point and pass under the transverse wires which are fastened to the frame, and are attached to the end of the frame opposite that in which the twist is formed. The wires and the ends of the wire that forms the frame are parallel outside of the twist, and are placed in a wooden or non-conducting handle.

NEW WOODWORKING AND HOUSE AND CARRIAGE BUILDING INVENTIONS.

IMPROVED THILL COUPLING.

Francis E. Justice, Marysville, O.—The object of this invention is to provide a simple means for preventing the detachment of the thilliron except when the thills are raised to a vertical position, and also for supporting the thill ends off the ground when the carriage is not in use. The said means consists of a horizontal bar attached to the under side of the eye of the thill iron, so as to come in contact with an elastic block which is secured in the socket of the clip in such position as to act as a buffer for the said bar when the thills are lowered.

NEW MECHANICAL AND ENGINEERING INVENTIONS.

IMPROVED SCROLL-SAWING MACHINE.

William Hinchliffe, Nashville, Tenn.—The object of this invention is to provide a simple easy-running scroll saw, that maintains an even tension on the blade at every portion of the stroke. The table, similar to an ordinary sawing machine table, in which the shaft of the driving wheel is journaled, and in the lower part of which is pivoted the treadle which is connected by a pitman with the crank formed in the shaft of the wheel. The saw blade is clamped to the bars by means of the clamping screws, and the position of the saw in the clamping device is determined by a pin that projects from the side of each head. The machine is operated by working the treadle, and more or less tension is given the saw by turning a screw, and by turning another screw the table may be pitched or inclined. The arrangement of the spring is such that the tension on the saw is always the same in all parts of the stroke.

IMPROVED DEVICE FOR SUPPLYING LOCOMOTIVE TENDERS WITH FUEL.

Will C. Hamner, Water Valley, Miss.—The object of this invention is to furnish an improved device for supplying locomotive tenders with coal or which shall be so constructed as to discharge the required supply into the tender at once, so as to avoid the delay which is unavoidable when the tenders are supplied in the usual way. The invention consists in the employment of a pivoted or tilting box for supplying locomotive tenders with fuel. To the platform of the railroad track are attached two posts, to the upper ends of which is pivoted a box. The box is made of such a size as to contain the quantity of coal or wood to be supplied to a tender at a time. To the side of the box is pivoted a hook latch to catch upon a pin attached to a post secured to the platform. The latch is held forward by a spring attached to the box, and its forward movement is limited by a stop pin also attached to said box, so that the latch will always be in position to catch upon the pin automatically when the box is swung back into place after being tilted to discharge its contents.

IMPROVED SAND CONVEYOR.

Rufino C. Garcia, San Antonio, Texas, assignor to himself and Aug. Robin.—This invention relates to a machine constructed for taking up and conveying sand into a suitable receptacle. The machine may be pulled by hand or horse power over the sandy ground, the same being first loosened by a series of detachable teeth. A drum is provided with a number of circumferential cutting knives, and constructed of sufficient weight to sink them into the sand, and pack the same tightly in the spaces or sections between the knives, and is retained in the sections and carried up between the knives to scrapers, passing them over to an inclined plate that is secured rigidly on side supports of the tongue frame, and over a hinged apron to a suitable receiving box, which is supported on the tongue of the machine, and is readily dumped or removed when filled with sand. In this manner sand for various purposes is readily taken up and collected in cheap and effective manner, requiring only one attendant, either for driving the horse or pulling and discharging the machine.

IMPROVED GAS-WASHING APPARATUS.

William M. Cosh, Conshohocken, Pa.—The form of this apparatus is similar to the ordinary gas-washing box, and has an inclined longitudinal partition, which, in a transverse direction, is horizontal. A shelf or partition extends from a point near the outlet gas pipe near to the opposite end of the washing box. Plain transverse ribs or brakes project downward from the under surface of the shelf, and notched transverse ribs are placed between these ribs and project in the same direction. An inlet gas pipe leads from the gas generator, and projects downward through the partition, and an outlet gas pipe leads from the washing box. There is an overflow pipe, through which the water may escape; and a blow-off pipe for removing the water when required. A door is hinged to the lower end of the shelf, and is capable of being thrown against the end of the box by gas pressure. The operation is as follows: The box is filled with water, so as to completely cover the inclined shelf, and the supply is maintained by a spring tube, in the usual way. Gas is forced in through the pipe and follows the under surface of the shelf or partition toward the outlet pipe. In its passage it is deflected by ribs, and thrown down a number of times before reaching the upper end of the partition. By this means the gas is brought into contact with a greater surface of water than in boxes of ordinary construction.

IMPROVED VALVE GEAR FOR STEAM ENGINES.

James H. Davis and William White, Winnsborough, Tex.—The object of this invention is to furnish an improvement in steam engines which shall be so constructed as to give a full application of the steam and a free exhaust at regular intervals, which will enable the engine to be easily reversed, can be easily attached to any engine, which will enable an engine to be worked by water pressure, will run smoothly and with very little friction, and will be very durable. The crank wheel is made with a projection rim, to the inner surface of which is attached, or upon it is formed, an oval or double inclined projection or cam. The projection or cam at each half revolution of the wheel strikes against one or the other of two pins, which have rollers placed upon them to diminish friction, and are attached to a sliding bar at such distance apart that they may be struck alternately by the projection, to give a reciprocating movement to the bar. The bar slides in the bearings in the supports, and to it is attached the stem of the inlet valve, which slides in the steam chest and admits steam into the ends of the cylinder alternately. The end of the bar is pivoted to the end of an arm rigidly attached to an upright rock shaft, which is provided with two rigid arms projecting in opposite directions, and at right angles with the arms. To the ends of the arms are pivoted the outer ends of the stems of the outlet or exhaust valves, which are placed at the ends of the cylinder, and from which the exhaust steam passes directly down into the heater. The rock shaft is provided with a handle to enable it to be turned to reverse the engine.

IMPROVED TIME LOCK.

John B. Overmyer and James A. Huston, New Lexington, O.—The object of this invention is to so improve the time lock that the setting of the lock is facilitated and accomplished in a simple manner without interfering with the time pieces that work the bolt-releasing mechanism, and also the stop mechanism, arranged to be thrown at a certain fixed time in automatic manner. The invention consists of a time lock in which the releasing nut is moved by time mechanism to throw out the lever stop and release the bolt at the proper time, the nut being reset by a toothed drum gearing with the toothed nut. The lever stop is retained in position by the bottom arm of a pivoted lever that is automatically worked by the pointer of the nut engaging an adjustable rick of the retaining lever. To secure the reliable working of the lock, two or more time movements and releasing devices may be arranged, so that in case one timepiece should stop the other would release the bolt. By a proper adjustment of the disk the bolt may be thrown, while the stop is retained in raised position by an arm until the pointer, bearing against the disk, carries the arm back and allows the stop to drop. Thus the additional facility of the automatic throwing of the stop of the time lock at a certain fixed time may be accomplished, which adds greatly to the usefulness and convenience of the lock.

IMPROVED HYDRAULIC ELEVATOR.

George Ball, Springfield, Ill.—This invention is designed to furnish an apparatus for removing iron piles, steel ingots, and other heavy pieces of iron or steel from heating furnaces; also for removing, in packing-houses, dead animals from scalding vats, and for other purposes; and the invention consists of a steam or hydraulic ram, connected by suitable transmitting pulleys and ropes with standards of the different furnaces, the ram being operated by starting cords connected to the steam entrance valve, and provided with devices for exhausting the cylinder and cushioning the ram piston. For the purpose of removing a pile or other body from the furnace the cushioning and exhaust rod tappets on the ram are adjusted to give a stroke equal to one half length of the distance to which the pile is to be moved. The buggy is placed under the fore plate of the furnace door when the heater's helper takes the tongue attached to the chain, introduces them into the furnace, and grasps the pile. The helper assumes a position near the starting rope, and, when all is ready, pulls the same, at first gradually, to take up the slack of the same. Steam is thereby admitted into the cylinder of the ram, the piston propelled upward, the line of rope taken up, and the pile delivered on the buggy in good shape. The starting rope is then released by the helper, so that the spring of the lever shuts off the steam, exhausting that in the cylinder, and causing the piston head to return to its original place, ready for the next pull. In case the spring should fail to work, the whole stroke is made by the piston, until the crosshead strikes the exhaust tappet, accomplishes the exhaust, and shuts off the steam, bringing the piston back to rest.

IMPROVED GIN SAW FILING MACHINE.

Albert S. Eastham, Navasota, Texas.—This invention relates to improvements in machines for filing the saws of cotton gins in a reliable, rapid, and uniform manner; and the invention consists of a revolving circular file, that is withdrawn by suitable mechanism to admit the intermittent feeding of the gin saw one tooth, which is accomplished by a feed hand and drag or check pawl. The edges of the saw teeth are sharpened by means of reciprocating files at both sides of the saw. The rotary file is thrown out of the teeth of the saw when the saw-feeding device moves the saw, being again raised to filing position in the next notch. The file lever is weighted in suitable manner, so as to carry the rotary file back into filing position as soon as the lever is released by the rear arm of the rock lever. The rotary file is pressed against the saw with equal force, whether the same is in or out of circle, or by the weight of the file lever, which weight is moved back or forward thereon to obtain the desired pressure of the file on the saw. All the saws on the cylinder can be brought to the same diameter and in circle by placing the circular file to the saw most out of circle,

and to that part of the saw nearest to the center of oscillation, and passing a pin through the rear end of file lever and the rear guide post of the same.

IMPROVED TRACTION ENGINE.

Leander Walker, Dallas, Texas.—This invention has relation to traction engines for running on common roads and rails, and to be used for drawing plows, and as a motive power generally. The nature of the invention consists mainly in transmitting motion to the driving and transporting wheels by means of the friction of a long rotating shaft inclosed inside of elongated hubs of said wheels. The invention further consists in combining friction pressure wheels with the hubs of the driving wheels for increasing the friction on the latter, as will be explained. By means of the screws the wheels can be very forcibly pressed against the hubs, and any desired degree of friction produced. The power which drives the wheels acts through the medium of the axle, which may turn faster than the wheels; consequently the amount of friction can be so regulated that the wheels cannot slip on the ground, however great may be the power applied to turn the axle.

IMPROVED CANAL BOAT.

William P. Fest, Chicago, Ill.—The object of this invention is to furnish a new construction of canal boat, and improved system of propelling the same, by which the water is not agitated in the least, and the washing of the banks prevented, the propelling mechanism being arranged with equal facility in new or old boats, so as to enable them to travel at considerable speed and in either direction. The invention consists of a canal boat having a central water channel extending at the bottom of the boat from the bow to the stern, and admitting and discharging the water through apertures of equal size in the hull of the vessel. A spiral propelling screw is arranged inside of the water channel at the center of the boat, and the channel divided into arms or branches back of the same, that unite to a single channel before the water leaves the boat. The boat may be propelled with considerable speed in forward direction, and also reversed, as the screw works equally well in either direction; but when the boat is required to be regularly propelled in both directions, a second set of branch channels has to be arranged at the front part of the boat, in connection with side and lateral gates, for establishing either communication with the central channels or with the branch channels. The entire propelling apparatus of the boat takes up but a small space at the bottom of the boat, and may be built at comparatively small cost, furnishing thereby a canal boat that may be run as a towboat or as a regular canal steamer, which, by the perfectly still state of the water at the discharge opening of the stern, has not the least injurious influence on the canal banks.

IMPROVED CAR BRAKE AND STARTER.

Alexander Winston, Fayette, Iowa.—The object of this invention is to provide for street cars and other purposes an improved rotary cumulative brake, by which the power lost in stopping the car is stored and utilized for starting the same; and the invention consists of friction wheels worked by contact with the car wheel when applied by the brake lever, producing the winding up of one or more springs, and the locking of the same by pawl and ratchet devices on the shafts of the friction wheels until the pawls are released by a treadle, and the power stored up in the springs applied to the wheels for starting the car. The brake mechanism may be used in either direction, the friction wheel shafts sliding in guide slots of the car frame. As soon as the car is desired to be started the brake lever is held in backward direction, so as to press the friction wheels against the car wheels, but at the same time a treadle, operated by the foot, lifts one pawl out of the ratchet, said pawl releasing, by its pivot joint, the second pawl, so as to throw the joint power of the springs on the friction wheels, and by the same on the car wheels, assisting thereby materially in starting the car. The springs of one shaft coil in opposite direction to that of the other, so as to admit the cumulative working of the brake and starting device in either direction.

IMPROVED ENGINEERS' PLOTTING TABLE.

Albert R. Crandall, Lexington, Ky.—The object of this invention is to furnish for engineers and surveyors an improved plotting table, by which the field notes may be plotted in rapid and accurate manner at a saving of time, and without taxing the eyes to injury in the least; and it consists of a sliding and slotted table carrying the plotting paper, in connection with a base disk and the foot or clamp of the protractor and retaining weights. The foot or clamp and the protractor are arranged on a shaft vertically above the center of the base disk, the shaft having a prick point at the lower end for marking the stations. A suitable lever arrangement raises alternately the weights from the paper, and lowers the foot clamp of the protractor, or raises the foot clamp and lowers the weights, which adjust themselves by pulleys on the concave arms. The protractor turns the paper, and is adjusted by hand, and by a tangent screw and spring clamp, to the vernier. The foot clamp carries a thread, adjustable by screws, in line with the zero points of the protractor, to set the paper by and to detect errors in case any should occur. The sliding table is operated by a micrometer screw, whose head is divided at the circumference, being arranged to turn freely on the shank of the screw, and also to be clamped to a fixed head by a thumb screw, so that each measurement may start from the zero point of the head.

NEW MISCELLANEOUS INVENTIONS.

IMPROVED FIRE ESCAPE LADDER.

Henry B. Walbridge, Brooklyn, N. Y.—The object of this invention is to provide a portable and convenient ladder, more particularly designed for use as a fire escape, but which may be used for other purposes. In construction there is a pole, having a disk or bridge piece at or near its center, over which the stay rods are stretched, which rods are fastened to the pole near its ends, and serve to stiffen and strengthen it. In one end of this pole there is a pulley, and to the other end a crosstree is attached, which is provided with two spikes or points. This pole in the present case is hinged or pivoted to a truck. A jointed or rope ladder is attached to the crosstree by means of ropes or chains, and to the free end of the said ladder a rope or chain is attached, which runs over the pulley and downward toward the foot of the ladder, and is operated by hand or by means of a suitable windlass. A brace is pivoted to the pole which is inserted in the first joint of the ladder, to keep it the proper distance from the pole. In a case of fire, when invalids or timid persons are to be removed from upper parts of buildings, a box or basket is provided, which is secured to the ladder by means of a hook. This box, together with the ladder, may be raised and lowered by means of the rope or chain.

IMPROVED LAST.

John T. Poole, Benton, New Brunswick, Canada, assignor to Samuel J. Parsons.—The object of this invention is to furnish an improved device for securing the block to the last, which shall be simple in construction and reliable in use. This last is so constructed that when the block is pushed down into place in the recess in the last a hook and catch will engage with the rear and forward edges of a plate and fasten the bar securely. When the block is to be withdrawn, a hook is inserted in the hook hole in front of the upper arm of the catch lever, and as the hook is drawn upon the catch will be raised, which will allow the hook to be withdrawn from the plate and the block to be removed.

IMPROVED STIRRUP FOR OIL-WEEL MACHINERY.

Frans A. Segerdahl, Karns City, Pa.—Stirrups as ordinarily constructed for oil pumps are liable to breakage, and are a constant source of trouble and expense. The object of this invention is to provide a stirrup which shall obviate these difficulties. The side pieces of the stirrup and the bar receives the strap from the walking beam. Shoulders are formed by drawing in the side pieces to receive the pitman. Stays or braces are

formed on the stirrup, that extend from the lower end of the side pieces above the shoulder. The eyes thus formed are filled with wood or other suitable material, and the sides of the stirrup are drilled to receive bolts having beveled heads. Beveled washers having flanges that embrace the sides of the stirrup are placed under the nuts of the bolts. Stirrups as commonly made are not provided with the braces, and are constantly breaking at the shoulders. By means of this improvement this difficulty is entirely obviated.

IMPROVED ARTIFICIAL LEG.

Cornelius Collins, Albia, Iowa.—This invention consists in a novel construction of the ankle joint, whereby a perfectly free articulation is allowed without noise. The lower end of the block forming the lower portion of the limb is curved, leaving a reduced bearing, which will allow a free motion of the foot forward and backward as well as laterally. The front concave surface of the block rests upon a cushion, and is held down thereon by means of a joint formed of two bolts. The joint thus formed will allow free play, and the cushion will prevent shocks in walking. In rear of the joint is a hook, which is connected by an eye joint with a bolt fixed into the block. The hook enters a recess made through the foot section and engages loosely with a pin fixed into this section. This hook joint also engages the foot to articulate forward and backward, as well as laterally. The bottom of the foot is arched out and the space filled with hair, or some other suitable material which will prevent noise in walking and afford elasticity. The cushion thus formed is covered with a piece of leather, which forms the joint for the front section of the foot. This knee spring is a strong strip of india rubber, fastened in such manner that it will act to strengthen the leg when fixed.

IMPROVED CIGAR-BUNCHING MACHINE.

Charles H. Schneider, Cold Spring, N. Y.—This invention relates to an improved machine for making cigar bunches in rapid and uniform manner, so as to facilitate and expedite the manufacture of cigars; and the invention consists of a crank roller, a sliding roller, moving along brackets, with inclined parts and recesses, a lower adjustable roller, and of an endless band or apron, that passes around the rollers and revolves with the same. For working the machine, the binder is first placed upon the band or section of the apron between rollers, the sliding roller having been placed in to forward position against the shoulders of the brackets. The filler, of any size, is then placed upon the binders, the fingers readily determining when the required quantity of tobacco is therein. The binder and fillers are then gradually pressed down between the two rollers, the sliding roller being brought forward on the inclines of the brackets until it comes into contact with another roller, when it drops into a slot and remains in fixed position therein. After the whole series of aprons has thus been filled the crank roller is revolved three or four times, and the bunches then taken out, being ready for the moulds. By arranging a number of aprons and rollers in one machine, the operator passes first along the entire series of aprons, and charges the same with binders and fillers, and turns finally the crank, forming the bunches, and throwing them out by a slight backward turn of the crank, enabling thus the turning out of a large number of uniform bunches in quick and economical manner.

IMPROVED GAME APPARATUS.

James F. Spence, Brooklyn, N. Y., assignor to himself, Calvin E. Davis, and Royal P. Wilkins.—This invention relates to games which are played with balls; and the nature of the invention consists, first, in a circular table having a central conical depression, surrounded by an inclined shelf and inclosed by a rim or guard, which is of convolute form, with one or more gates or openings leading upon the shelf, the said central conical depression being provided with radial channels flaring outwardly and adapted to receive the balls which are projected on the table, and to indicate by figures the different amounts won by the players; second, in a blowpipe of novel construction, which is provided with a spring in its enlarged end, and adapted for propelling the balls upon the table by blowing through the pipe with the mouth.

IMPROVED HAIR CRIMPER.

John Leeming, Poughkeepsie, N. Y.—The object of this invention is to provide an inexpensive, efficient, and convenient device for crimping hair. It consists of a hairpin, similar to those in common use, differing only in having the bent part that unites the two prongs straight. Around this portion a wire is wound several times, and its ends are twisted together, forming a tongue, which is a little longer than the hairpin. This wire is made of flexible material, preferably of copper. The hair is interwoven with the prongs of the hairpin in the usual way, and the wire is bent around it. This device is small and light, and quickly and easily applied, and the hair may be crimped near its roots, and without the use of clamps.

NEW AGRICULTURAL INVENTIONS.

IMPROVED HAY ELEVATOR.

Julius L. Malcolm, New Athens, O.—The object of this invention is to facilitate the hoisting of the hay from the wagon to the mow in quick and convenient manner, the carriage being returned and locked after the load is dropped to the starting point above the wagon; and the invention consists of a track beam of inverted T-shape hung from the rafters of the barn and supporting the wheeled carriage. The pulley over which the hoisting rope passes has side projections, which are engaged by a fulcrum lever with end catches for supporting the load. The catch lever has a pendant stirrup that is raised by the sheave of the fork, so as to release the catch lever from a stop block of the track, and drop the same on the projections of the pulley, to retain load below the carriage until it arrives at the point where it is to be dropped. The catch lever is released from the recessed and curved stop block of the track by the contact of the sheave of the hay fork when the load is hoisted up to the track. The sheave raises the pendant stirrup of the catch lever, and throws the same out of the stop block, so as to clear the same and admit the forward motion of the carriage along the track. The catch lever engages then the catch pulley, and suspends thereby the load below the carriage. When the load arrives at the point where it is to be dropped, the trip cord is pulled and the fork opened. The carriage returns then along the inclined track, or by the action of the weighted cord, to its place above the wagon, where the catch lever is raised from the projections of the pulley by passing along the curved stop block, so as to release the pulley and admit the lowering of the fork to the wagon to be reloaded and hoisted as before.

IMPROVED GRAIN CRADLE.

George E. Clow, Seymour, Ind.—This improvement relates to providing a socket for the post of the cradle head, and to the construction whereby said socket is made adjustable and detachable, the object being, first, to enable the angle of the cradle head to snath and scythe to be changed at will, and second, to enable the parts composing the cradle to be separated for shipment.

NEW TEXTILE INVENTIONS.

IMPROVED CLOTH-MEASURING MACHINE.

William D. Porter, McComb, O.—This invention relates to a machine or apparatus in which cloth or other kind of fabric can be measured while being wound upon a roller. The board forming the center of a bolt of cloth or other fabric is clamped endwise between two aligned and axially adjustable rotary shafts, and as the cloth unwinds it passes over a reel, by which its length is measured, and is then wound upon a roller arranged parallel to the reel. In being unwound from said roller, it passes between two rolls and is thereby pressed and smoothed before being rewound upon the board.