

PROCEEDINGS OF THE AMERICAN ASSOCIATION FOR THE ADVANCEMENT OF SCIENCE.

We give, below, brief abstracts of the papers read at the meeting of the above named society, recently held at Buffalo, N. Y.

Professor Burt G. Wilder, in a paper entitled

NOTES ON NORTH AMERICAN GANOIDS,

called attention to two pairs of serrated cartilaginous appendages of skin on each side of the hyoid arch of the mud fish. These are too flexible to serve as offensive weapons; and as their function is not known, it was suggested that they be studied in the young fish. Dr. Newberry, in the discussion following the reading of the paper, considered that the parts were remnants of an armor fully developed in the progenitors of the species.

Professor Thomas Meehan took positive ground in an essay on the

FERTILIZATION OF FLOWERS,

against the theory that plants, as a general thing, abhor close breeding, and that all flowers with color, fragrance, and sweet odors can only be fertilized by insect agency. He stated that the flowers of the black cap and other raspberries, which have neither color nor fragrance, are remarkably attractive to insects: and yet the flowers produce raspberries just as well under gauze bags, when the insects are excluded. He summed up his conclusions in the following propositions: First. Cross fertilization by insect agency exists, but not nearly to the extent claimed for it. Second. Where it does exist, there is no evidence that it is of any material benefit to the race. Third. Difficulties in self-fertilization result from physiological disturbances that have no relation to the general welfare of plants as species.

Some interesting observations on the effects of temperature in changing the

INDEX OF REFRACTION IN SPECTROSCOPE PRISMS

were made by Professor T. C. Mendenhall. From experiments made with glass heated as high as 392° Fah., it was found that the change of the index of refraction in glass for 9° Fah. is 0.00003. This affords a new scale of comparison in cases where there are differences of temperature to be considered.

Professor C. A. Young described

A NEW ARRANGEMENT OF THE SPECTROSCOPE

for obtaining lines more conveniently separated, and thus facilitating observations of the velocity of the movements of heavenly bodies through the displacement of said lines. Having calculated the scale which this new arrangement required, he applied it to observations of the comparative speed of the sides of the sun, one of which is of course approaching us, while the other recedes, because of its revolution on its axis. These observations give an average for the motion of 123 miles per second. Calculation would give by mere theory this motion as 103; but the difference by spectroscopy is within the limits of error of observation.

Professor A. W. Wright added a note, giving the results of further investigation into the nature of the

ZODIACAL LIGHT.

Careful researches on his part had shown that the zodiacal spectrum varied but little, if at all, from the solar spectrum except in length, that difference being due to the fact that the former was a faint light. The line 577, which a previous observer had found in the zodiacal light, Professor Wright thought was due to an aurora present at the time of observation. The conclusion was that the zodiacal light must be that of the sun, probably reflected from numerous small meteoric bodies, revolving around that luminary.

THE FLYING LIZARDS OF AMERICA

was a brief essay by Professor O. C. Marsh, giving a description of the principal characteristics of American pterodactyls. The animal is only known through the labors of geologists.

It was found from the American specimens that there has been a misunderstanding about the pelvis of the animal. The ischia are found firmly coossified on the medial line, and the pelvis differs in other particulars from what had been supposed. The American specimens give a clear idea, such as was not previously attained, of the hind feet of the animal. The lower end of the tibia has a pulley-like articulation, similar to the bones of a bird. There are also at least two separate tarsal bones. There is also this remarkable circumstance. In the geological horizon where the pterodactyls are found in this country, all the birds discovered have teeth, and hence are unlike all other birds: while pterodactyls are found having no teeth, and hence unlike all other pterodactyls.

Professor S. W. Garman, of the Museum of Comparative Anatomy, at Cambridge, Mass., read a paper on the

COLORS OF ANIMALS.

Despite the popular notion that the chameleon and other animals can change their color at will, he says there is a want of scientific evidence in favor of the belief. Drawing up for consideration a schedule of animals in two groups of comparative brilliance and paleness, we find that light or darkness of habitat determine the colors as a whole. The amount of light in their surroundings is in inverse relation to the brilliance of color. The dark colors are found in forests and on dark soils; the light colors on plains and snow. The bleaching process applies to the lower surface, to the ventral portions of animals by reflection. In the water the same is true, the rivers with muddy bottoms being peopled by dark forms; the brilliant colors are found in hot and sunny waters or transparent lakes. This was shown in a great variety of instances.

Naval Items.

It is the intention of the navy department to put the steamers Alliance and Ranger in commission. The Alliance is of the same class as the Adams, which made such successful runs over the measured mile at League Island on August 14, the average speed for four runs being 11.3 knots, with 63.04 revolutions of the screw, developing 882 horse power. Better results would have been obtained had there been a greater depth of water on the course. On returning to her anchorage after completing the trial, she passed through 7 1/2 fathoms of water, when the revolutions, with the same pressure of steam and same cut-off, increased to 68 1/2, which would have given 11.6 knots.

NAVAL ENGINEER CORPS GAZETTE.

Passed Assistant Engineer L. R. Harvey detached from the United States steamer Pensacola, and to wait orders at San Francisco, Cal.

Passed Assistant Engineer J. F. Bingham detached from the Mare Island navy yard and ordered to the Pensacola.

Assistant Engineer W. H. Platt ordered to report for examination, preliminary to promotion.

Better Times at Hand.

On every side, evidences of a better state of business feeling prevails. Our merchants are confident of a good fall trade, and the fear that the coming winter will be an exceptionally severe one on our working people is being dispelled by many stable signs of brisk trade this autumn. Even in New England, where the business depression has been most disastrously felt, quite a number of large mills, silent for many months past, are starting into action and on full time, for the fall and winter. In our State, says the Philadelphia *Inquirer*, some of the furnaces, mills, and factories, shut up for over a year, have been reopened, and work has been or will be resumed very shortly. The reason of this is that prices have touched their lowest point and show signs of improvement. Stocks of goods have been reduced to the bare boards, or very near them; the products of the country have been unprecedented; and there is at last some encouragement to resume traffic with a prospect of profit, for that is the great business magnet. If our merchants and manufacturers can now resurrect the old-time commercial confidence, we may look for the dawn of better times very soon.

Tasteful Steel Plate Engraving.

We rarely seen more tasteful and novel designs for business cards, checks, letter headings, and similar work on steel than those produced by Messrs. John A. Lowell & Co., of Boston, Mass. By means of finely ruled lines, enclosed in simple yet handsome shields and like figures, effects of great beauty are produced at moderate cost. To manufacturers, bankers, merchants, and indeed all who take pride in handsome bill heads, checks, bonds, and stock and society certificates, we can recommend the artistic productions of the above firm.

NEW BOOKS AND PUBLICATIONS.

THE COMPLETE PRACTICAL MACHINIST, embracing Lathe Work, Vise Work, Drills and Drilling, Taps and Dies, Hardening and Tempering, the Making and Use of Tools, etc. Illustrated by 130 Engravings. By Joshua Rose. Sent free by mail on receipt of price, \$2.50. Philadelphia, Pa.: Henry Carey Baird & Co., 810 Walnut street.

We have given to our readers so much practical information, on all branches of the art of producing the finest mechanical work in the most economical manner, from the pen of the author of this book, that any commendation here bestowed by us on the work would seem like egotism. The tens of thousands of skilled operatives who read these pages look regularly for some fresh instruction in manipulating tools, some new method of working out a mechanical idea, in our chapters on "Practical Mechanism;" and they are, we know well, seldom disappointed in their search. Mr. Rose justly says in his preface that the education of the machinist has not received its proper share of attention at the hands of authors who have written on mechanical subjects; and he has labored faithfully and skillfully to remedy this defect, and has produced a volume of condensed instruction, extracted from long experience in many countries, which could only be written by an engineer and mechanic of the highest skill, endowed with unusual facility in explaining and illustrating his meaning.

FILTH DISEASES AND THEIR PREVENTION. By John Simon, M. D., F. R. C. S., Chief Medical Officer of the Privy Council and of the Local Government Board of Great Britain. Price \$1. Boston, Mass.: James Campbell, Publisher.

Mr. Simon's labors in the etiology of disease have been for many years regarded as the master work in sanitary science; and his reports are matters of worldwide importance, illustrating the causes and development of all the preventable diseases, which do not vary in different localities. His skill in investigation is worthily supplemented by a clear, concise, and methodical mode of explaining his views; and the thoroughness with which all his work is done gives it the highest value. The State Board of Health of Massachusetts has ordered this reprint of Mr. Simon's last essay to be published, and they state truly enough that, "if the practical suggestions made therein were acted on by all citizens, hundreds of lives now annually doomed to destruction would be saved, and the health and comfort of the people greatly increased." We shall shortly publish some extracts from this valuable document, which is one of the greatest importance to every government and people.

WOOD CONVERSION BY MACHINERY. By John Richards, M. E. London, England: J. & W. Rider, 14 Bartholomew Close.

The author of this book is a member of the firm of Richards, London, & Kelley, of Philadelphia, but has been for some time a resident of London. The essays which make up this volume have been published in the *Timber Trades Journal*; and they contain some valuable practical information on all branches of the subject. In the chapter on "patent monopoly in wood conversion," there is a boldly outspoken criticism on the action of the Patent Office in the notorious Woodbury planer case, which we commend to the attention of the woodworkers of this country. We shall probably recur to this volume again.

THE INTERCOLONIAL: an Historical Sketch of the Inception, Location, Construction, and Completion of the Line of Railway Uniting the Inland and Atlantic Provinces of the Dominion of Canada. By Sandford Fleming, C. E., Engineer in Chief of the Newfoundland, Intercolonial, and Canadian Pacific Railways. Montreal, P. Q.: Dawson Brothers, 159 St. James street.

This volume affords an excellent idea of the formidable difficulties encountered in the construction of the railway through the "wilderness,"

which, as the author truly says, "separated the Maritime from the Inland Provinces." The natural obstacles in the way were enormous, and they were conquered only by great courage and untiring patience; and the result is a railway which, "in all the essentials, has no superior."

Inventions Patented in England by Americans.

(Compiled from the Commissioners of Patents' Journal.)

From August 1 to August 9, 1876, inclusive.

- BOILER.—A. D. Brock, Washington, D. C.
- BUFFING LEATHER, ETC.—J. E. Fisk, Salem, Mass.
- CHILD'S CARRIAGE, ETC.—C. F. Tenney et al., Baldwinville, Mass.
- COOKING UTENSIL.—J. H. Weare et al., Cincinnati, Ohio.
- ELEVATOR.—R. K. Terry, Jersey City, N. J.
- FISH JOINT, ETC.—R. Long, Pittsburgh, Pa.
- GAS GENERATOR.—W. Maynard, New York city.
- HYDRAULIC PROPELLER.—G. G. Caldwell, Baltimore, Md.
- INDICATOR.—J. W. Thompson, Salem, Ohio.
- MICROSCOPE.—J. Zentmayer, Philadelphia, Pa.
- PAPER BOX, ETC.—S. Wheeler et al., Albany, N. Y.
- PAVEMENT.—J. Shillinger, New York city.
- PIPE COUPLING.—H. Pennie, Brooklyn, N. Y.
- POSTAGE STAMP, ETC.—L. H. G. Ehrhardt, Philadelphia, Pa.
- PROPELLING POWER, ETC.—F. J. Bell (of Phila., Pa.), London, England
- SASH PULLEY CASE, ETC.—W. T. Doremus, New York city.
- SEPARATING LIQUIDS.—J. J. Thomas, Philadelphia, Pa.
- SMOKELESS FURNACE.—J. W. Bonta, New Brighton, Pa.
- TELEGRAPH CABLE, ETC.—W. Strickler, Lebanon, Pa.

Recent American and Foreign Patents.

NEW MECHANICAL AND ENGINEERING INVENTIONS.

IMPROVED LOCOMOTIVE DRAFT PIPE.

Thomas Diffenbaugh, Danville, Ill.—This is an improvement in the draft or lifting pipe of locomotive and other high pressure engines that exhaust into the chimney, which draft pipe is commonly known to locomotive engineers as a petticoat pipe; and it consists in making the draft pipe in sections, and adjustable by lever connection with the cabin of the locomotive. The common practice at present is to close up the exhaust nozzles, which, when the engine is working at full stroke, are not large enough to allow the exhaust steam to escape freely into the smoke stack, thereby cramping the engine, as the steam cannot be exhausted quick enough. By making the draft pipe variable in size, the nozzles may be made larger than at present, and the pipe then be adjusted to the volume of the exhaust steam—larger when the engine is working at full stroke and exhausting a whole cylinder of steam, and smaller when cutting off and exhausting only part of the quantity, thereby allowing the engine to work with more freedom, and maintaining a sharp draft when required.

IMPROVED PISTON.

John Wood, Jr., Conshohocken, Pa.—This invention is a universal expanding device for the pistons of steam engines, capable of expanding the packing rings equally with a positive motion, so that, while the piston can be adjusted when desirable, it acts, while working, like a solid piston; and it consists in the combination of followers sliding in suitable radial ways in the piston head, with a central sectional core or cylinder, which is bored out conically, and is provided with a conical plug, which, when forced into the sectional core, by means of a screw placed in the piston head for that purpose, expands, forcing the followers against the packing rings. The advantages claimed are that, while the piston can be adjusted to take up the usual wear, it will accommodate itself to the inequalities in the cylinder, and will not wear more in one place than in another, as is the case with packing which adjusts itself. Another important advantage is that it obviates the necessity of removing the follower to adjust the packing.

IMPROVED PUMP VALVE.

Mrs. Charlotte Thomas, executrix of William H. Thomas, deceased, Sacramento, Cal.—The object of this invention is to provide an improved substitute for frapper valves whose hinged flap, or movable piece, is composed of leather. To this end, the invention relates particularly to the valved seat composed of hard metal and having a beveled rim, the improved valve having an annulus of soft metal secured in a suitable cavity, and the vertical guides for causing the valve to seat itself accurately, these elements being conjoined under a particular arrangement whereby the valve seats itself in the soft metal at each stroke, and always in the same place.

IMPROVED COMBINATION LOCK.

George Winter, Jacksonville, Va.—In this invention, the bolt is locked by a series of sliding dogs or tumblers provided with semicircular grooves to receive rotating pins, having semicylindrical posts adapted to fit in said grooves. When the pins are adjusted in one position, the dogs may be raised simultaneously out of the notches in the bolt, thus allowing the latter to be withdrawn into the case; but when adjusted in another position, the dogs are held locked, the semicylindrical portion of the pins in such case entering the grooves in the dogs. The position of the pins is indicated by a series of fingers inserted in the dogs, and pointing to numerals inscribed on the face of the lock.

IMPROVED HORSESHOE MACHINE.

John W. Chewing, Jr., Shadwell Depot, Va.—This invention relates to a novel construction of horseshoe machine; and it consists in the construction and arrangement of the devices for operating the swaging die and bending jaws, in the combination with the pivoted jaws of bending and guide rollers, in the construction and arrangement of the ejector for the swaged horseshoe, in the construction and arrangement of the knife for cutting off the section of the bar forming the horseshoe, and in the means for adjusting the length of said section.

IMPROVED SELF-DUMPING SCOW.

Philetus L. Murphy, New York city, assignor to himself and John A. Squires, same place.—This consists in a scow made in two parts, having the plane of division passing longitudinally through its center, the deck being inclined from the outer sides to the line of division. The parts connect with each other at one end by hinges, and at the other end by a rope, so that when said rope is released the weight of the load may force the parts apart, and thus dump the load automatically.

IMPROVED STONE-SAWING MACHINE.

James Pepler, Green Point, N. Y.—This invention consists in the arrangement of roller guides for the saws, which make it possible to make diagonal or straight cuts through a block, or to make both diagonal or straight cuts at one time in a block of stone. The operation may be described as follows: The block of marble or other stone to be sawn is placed on the support; and if it is to be worked up into monument shafts, the saws are arranged so that the rollers will guide and deflect them so that they will saw diagonally through the block. On turning the blocks over, the saws are arranged two in one socket or holder at one end, to bring them as near together as possible, to cut out the wedge between the shafts. The saws may be arranged so that part only will saw diagonally, or all may be adjusted to saw in that way.

IMPROVED NAIL PLATE FEEDER.

William H. Rittenhouse, Norristown, Pa.—In this invention, two spring nose pieces are employed instead of the one rigid one heretofore used, in order that, when the barrel is turning over on one of them, its weight and the pressure of the bearings will spring it, and so nip the plate that it will not feed while turning. The blank from which the nail is cut obliquely across has one edge longer than the other, necessarily; and as the reciprocal feed turns the long and the short edge up alternately, in ordinary nail plate feeders, high speed is not possible, because the moving knife lifts the plate from the bed knife when, in turning, the long edge is up. But in this device, when the short edge is up, and the nose piece made to spring and bind the plate, the moving knife will clear it every time, and there is no limit to the speed, so far as the feed is concerned.

IMPROVED RAILROAD RAIL JOINT.

Duncan C. Waddell and John F. Finger, Marion, S. C.—This invention consists of a chair that embraces the bottom and inner side of the rail, and is provided with a central standard or bearing piece, which comes between the ends of the rails when they are placed in the chair, and extends beyond the outside of the rail, where it is mortised to receive a split key, that rears against the web, the said key being retained by a wedge driven in the split. The device forms a rigid support for the ends of the rails. It may either be placed on the cross ties or between them. The bearing piece between the ends of the rails permits the wheels to pass over the joint without jarring or injuring the end of the rail.

IMPROVED SEWING MACHINE FOR EMBROIDERY.

Charles Marin, Newark, N. J., assignor to himself and Isidore Rosenthal, New York city.—This invention produces embroidery stitches of varying lengths at one side of the fabric only, and retains the embroidery stitches at the ends by fastening stitches that pass through the fabric at a considerable saving of thread. The machine is made in the nature of the sewing machine, and produces, by the parallel and angular disposition of the thread, flat or raised designs of any configuration, in a rapid, even, and perfect manner. It consists, essentially, of a reciprocating needle bar, with two adjustable needles, a slotted presser foot, a swinging and parallel feeder, and a shuttle that places the embroidery stitch in position for the fastening end stitches of the adjustable needles.

IMPROVED WHEEL TIRE.

George Cornwall, Garden City, N. Y.—This consists of a tire the essential part of which is rawhide. The hide is fitted on a metal hoop while in a soft state for fixing it in the required shape, and an elastic cushion of rubber is interposed between the hide and the metal band.

IMPROVED LUBRICATOR.

Joseph W. Reed, Kalamazoo, Mich.—This invention is a double automatic lubricator for steam cylinders of locomotives and other engines, by which one of the lubricators may be dispensed with; and it consists of a cup cast in one piece with fixed internal feed pipes, having regulating top nozzles and outer cocks for shutting off the steam. The casting of feed pipes and cup in one piece makes the cup cheaper, and without joints. The steam passes up the pipes from the steam cylinder, and condenses gradually in the cup, which, by the double condensation pipes, forces the oil up the nozzles and down the pipes as long as the engine is running. When the steam is shut off, the supply of oil is interrupted, being regularly continued when the steam is let on again.

IMPROVED WIND WHEEL.

Alfred M. Vanpelt, Capioma, Kan.—By suitable construction, as the wind blows against the forward sides of the fans, it presses them against the weights, and the weights support them against the wind, unless it be strong enough to raise the said weights, and thus take the fans out of the wind. By suitable adjustment, the wheel may be arranged to work with any desired power.

IMPROVED WATER WHEEL.

Samuel G. Marlin, Clarion, Pa.—This consists of a wheel composed of two disks placed side by side, each having buckets and issues, which are so adjusted that the buckets of one fit in the issues of the other, in such manner that, by adjusting one of the disks toward or from the other, the capacity of the issues may be raised to any extent, and may also be closed altogether, if required to serve for the gate.

IMPROVED WINCH.

Elias Sorrinson, West De Pere, Wis.—This consists of a common winch, whose crank shaft is placed by sliding pinions in connection with a second hoisting drum, and with rubber rollers for taking up the slack. It serves to hoist two or more sails at once.

IMPROVED TOOL FOR CAPPING AND UNCAPPING CARTRIDGES.

Isidoro Zamboni and Carlo Zamboni, Owatonna, Minn.—This is an improved device for removing the exploded cap from a cartridge shell for breech-loading shot guns, and recapping and reloading the shells.

IMPROVED LIFTING JACK.

Thomas J. Corn, Sni Mills, Mo., assignor to himself and James M. Faulk, same place.—This consists in making the parts of a lifting jack so that they may be folded compactly together for storage or transportation. When this is desired, the lever is removed and the standards are folded.

IMPROVED MIDDINGS SEPARATOR.

Jefferson Graham, Alden, Minn.—There is a vertically reciprocating shoe having screens, each clothed with finer and coarser numbers of bolting cloth; also a series of chutes, one set for delivering the purified middlings out of the machine, and the other for delivering the imperfectly separated matters upon the screen below. With the above, a blast fan is combined.

IMPROVED GLOVE-SEWING MACHINE.

Peter E. Gullrandsen and Johan C. Rettinger, Copenhagen, Denmark.—The object of this invention is to construct a glove-sewing machine on the revolving hook system, which produces with two threads a stepping and cross stitch, that resembles and equals the best sewing done by hand, and makes the seams strong and durable. The device includes glove-feeding cups, reciprocating needle bar with tension devices, a rotating hook with bobbin and tension, and a compound mechanism for operating the cross stitching device. The horizontal actuating mechanism of the parts is inclosed below the table, and operated by a treadle, the glove-feeding cups being run close to each other, or at some distance from each other, to take hold or relinquish the work by means of a pressure spring and releasing treadle connection.

IMPROVED SLAUGHTERING APPARATUS.

Kennard Knott, London, Ontario, Canada.—This invention relates to an improved slaughtering apparatus in which the bullock is thrown down, and (after being killed) drawn out and deposited upon a car, which transports the body to the mechanism by which it is hoisted for being dressed. After the dressing operation it is lowered, divided in halves by a swinging saw, and the two parts, which are suspended from hanging tramways by wheel hooks, are quickly conveyed by said hooks into the freezing house, where they are packed, or from which they may be removed to cars or ships for transportation.

NEW CHEMICAL AND MISCELLANEOUS INVENTIONS.

IMPROVED POCKET CALENDAR.

Benjamin F. Norris, Chicago, Ill.—The improvement consists in the particular construction and arrangement of the two sheet metal disks to each other, one of which is provided with a series of indentations corresponding to the divisions of the calendar face, and the other of which is provided with a stud, one end of which affords a knob for turning the disk, and the other end of which forms a stop which enters into the indentation of the other disk, and by locking the two disks determines the proper registration of the divisions of the two disks and prevents accidental displacement of the same while in the pocket.

IMPROVED LANTERN.

Henry C. Kelly, Chicago, Ill.—This invention relates to a novel construction of the lantern; and it consists in the construction and arrangement of the burner and deflectors, the construction of the base provided with tubes for supplying air to the burner, the construction of the outlet for the hot air above, and the means for attaching the guards to the base piece, and thus connecting and holding the several parts together.

IMPROVED PUZZLE BLOCKS.

Ripley R. Calkins, St. Joseph, Mo.—The object of this invention is to provide a mechanical or material verification of the geometrical problem "that the square described upon the hypotenuse of a right-angled triangle is equal to the sum of the squares upon the other two sides." To this end the invention consists in the combination of five blocks, three of which are in the shape of similar right angle triangles, one in the shape of a trapezium, and the other in the shape of a trapezoid, which blocks are adapted to be put together to form a single square upon the hypotenuse of a right-angled triangle, or to be transferred or arranged in two squares upon the other two sides; the same to be used in schools for purposes of illustration, or to be used as a puzzle for general amusement.

IMPROVED STREET LAMP.

Lewis O. Cameron, Pittsburgh, Pa.—The improvements constituting the invention are embodied in three features, namely: 1st. Constructing the glass body of the lamp with a large opening at the bottom, and providing adjustable perforated plates for closing the same, the said plates being attached exteriorly. 2d. Making the metallic cap or top portion of the globe adjustable and removable. 3d. Providing the lamp with a detachable holder or reservoir for gasoline or other light hydrocarbon.

IMPROVED BROMINE STILL.

Freeling W. Arvine, Mason City, W. Va.—The points of novelty in this invention consist in making the still with a funnel-shaped bottom, introducing the steam pipe at the lowest point of the same, and providing an annular orifice for the escape of the liquid product. It also consists in providing a return pipe for the escaped bromine at the mouth of the receiver, and conducting the gas to an absorber where it is dissolved in bittern and returned to the still for utilization by decomposition.

IMPROVED HORSE DETACHER.

Amos M. Barker, Macon, Neb.—In using the device the cock eye of the tug is put over the outer arm of a double hook, and the head of a rod is placed in the space between the points of the said double hook, holding the hook securely in place. Should it become necessary to detach the horse, the driver pulls upon the cord attached to the arm of the rod. This turns the rod and raises its head out of the space between the points of the double hook, when the shaft strain turns the hook forward, draws the tug from the said hook, and the horse is detached.

IMPROVED POCKETBOOK FASTENING.

Ernst Schnopp, East New York, N. Y.—This lock consists of a face plate, with swinging handle, applied to the closing flap of the pocketbook. It has a center knob at the under side of the same, that enters a centrally perforated radial spring plate for closing the lock, the button being released by pulling at the face handle.

IMPROVED TEMPORARY BINDER.

Ferdinand Guicheteau, Brooklyn, N. Y.—This invention consists in the combination of a spring clip of novel construction with the back of a book-shaped box or receptacle, in such a way that letters, invoices, and other similar papers, may be placed on a pair of needles fixed to the said back and retained by a spring. The latter is slotted, and so placed as to be capable of following the papers down on the needles.

IMPROVED UMBRELLA SUPPORTER.

August H. Adams, Piqua, Ohio.—This consists of an attachment for vehicles, having a socket for the umbrella handle at one end and double sockets at a suitable angle at the opposite end, to be secured by clampscrews to a grooved supporting post attached to the wagon seat.

IMPROVED EAR RINGS.

Leon P. Jeanne, New York city.—This invention consists of a spring lever hook, attached to a knob of the ear ring or drop, and bent upward, so as to bear on the ear, and retain the button securely in position.

IMPROVED BILLIARD BALL.

Gustav Magnus, Berlin, Prussia.—These balls are made uniformly solid throughout, without any pores or cavities. They are perfectly elastic. They rebound to a height of eighty feet if thrown on an iron plate. Their center of gravity is exactly in the center of the ball, so that they lie still in any position on a surface of quicksilver. They do not crack or peel off, and they do not lose their color. The ingredients are rubber, sulphur, a suitable coloring matter, and heavy spar, or sulphate of baryta, the latter in a quantity at least fifty per cent of the rubber. The mixing is done in the usual way. After having made a ball, as nearly true as possible, and about one half inch smaller than the finished ball, it is enveloped in a sheet of the same mixture, having the required color, of three eighths of an inch thickness, and put in a very strong metallic mold of adequate form. The whole is then submitted to the curing process during at least ten hours, commencing with a low temperature, and increasing it slowly but steadily. The mixture is exposed only for one hour or less to the highest degree of heat, which will vary according to the quality of the india rubber used. The cured balls are then turned and finished.

NEW HOUSEHOLD INVENTIONS.

IMPROVED WATER FENDER FOR DOORS.

Elliot L. Valentine, Oakalla, Ill.—This consists of a water conduit, made from sheet metal, to be attached to doors, windows, and other similar places, to catch the water that drifts against them, and conduct it outside the shell.

IMPROVED WASH BENCH.

Peter E. Rudel, Grand Rapids, Mich.—This is a folding wash bench, hinged to a vertical standard carrying wringer rolls. The bench is formed of two sections, which consist each of a platform supported upon a hinged frame or leg, and adapted to fold and lie close against the upper portion of the standard.

IMPROVED INVALID BEDSTEAD.

Franklin E. Sawyer, Hyde Park, Vt.—This bedstead may be easily and conveniently adjusted by the occupant or attendant to any position, to be used as a common bed, or as a sofa or settee, or at any inclination. It is also easily movable from one room to the other, and has accommodations for the storing away of soiled clothes.

IMPROVED BOTTLE WASHER.

William Scherenberg, New York city.—In using the machine, the bottles are placed in a frame and secured. A trough is then lowered, bringing funnels into the mouths of the bottles, into which water and shot, tacks, or other suitable substance, are poured. A wheel is then turned which shakes the frame and bottles, washing the said bottles clean in a short time. When the bottles are sufficiently washed the frame is turned through a half revolution, which allows the water and shot or tacks to flow from the bottles into a basin.

IMPROVED WASHING MACHINE.

Allen D. Ferris and Albert N. Ferris, Blakeley, Minn.—The suds box is made in the form of a half cylinder, and to it is attached a series of parallel cross bars, which form the rubbing board, and at the same time strengthen the zinc bottom. The top opening is surrounded with a curve which prevents any water that may be spilled from running off upon the floor, and serves as a rest for the attachment of a wringer. Devices are provided to hold the suds box stationary while the wringer is being used.

IMPROVED SPRING PILLOW.

Jacob Beamer, Manor Station, Pa.—The object of this invention is to furnish, in place of the feather pillow, an improved wire spring pillow, that is conducive to sound and healthy sleep by keeping the head cool, and admitting pure air to the back of the same. Wire cloth is stretched on curved band springs, which are attached to the lower ends to a suitable supporting frame, and at the upper ends, by a cross strip, to upright rack bars. The supporting springs are laterally braced by a curved stiffening rod.

IMPROVED EVAPORATOR FOR REGISTERS.

W. R. Fowle, Baltimore, Md.—The invention consists in moistening hot air as it passes into an apartment from a furnace or stove, by causing it to pass through strips of absorbent material, more or less saturated with water. The absorbents are endless pieces of fabric held by opposite rolls, and dipping into the water, being spaced by ring grooves in the top roll. The invention is equally adapted to any form or location of register by means of an attachment open at the bottom so as to enclose with a lid the ordinary floor register, and provided with a rear opening to correspond with that of the evaporator.

NEW AGRICULTURAL INVENTIONS.

IMPROVED FARM GATE.

Dennis C. Bacon, Litchfield, Ill.—This consists in hitching the rear post of the frame to the main gate post, on which it turns by eyes and long staples.

IMPROVED CHURN.

David J. Rogers, Bardstown, Ky.—This invention relates to certain improvements in churns, designed to simplify and extend the use of the same, and expedite the operation of churning. It consists principally in the combination with a tube or case, provided with slits and perforations, of a projecting handle for holding the tube stationary against the bottom of the outer case while the dasher is being worked up and down in the said tube, by means of which arrangement any vessel without a special cover may be employed for the outer containing case, and the churning devices adapted for use in the one as well as in the other.

NEW WOODWORKING AND HOUSE AND CARRIAGE BUILDING INVENTIONS.

IMPROVED WAGON SPRING ATTACHMENT.

Reuben Doty and Joseph Doty, Wellsville, N. Y.—This is a device for attaching springs to a wagon body, composed of a top plate, a cross bar, encircling clip or band, and downward extending lugs, to form shackles for springs, the whole made in one piece.

IMPROVED ROCKER AND TRACK FOR CRADLES AND CHAIRS.

Daniel Rupp, Four Corners, Iowa.—This device is so constructed that the rocker shall always have a smooth surface to rock upon, however rough the floor may be, or however soft the carpet. The invention consists of a track having a right-angled bracket with a V-shaped slot, in combination with a cradle rocker, having a pin which enters the slot in the bracket.

IMPROVED PORTABLE HOUSE.

Francis M. West, Des Moines, and Addison R. Smalley, Snyder, Iowa.—This is a portable house that may be readily shipped and set up, and taken to pieces in case of fire, or for moving, the construction being strong and durable, while at the same time neat in appearance. The walls are made of grooved and tongue-locked logs, with detachable door and window casings applied in similar manner. The floor is connected to the joints by pins and recessed locking strips, while the roof sections are supported on dovetailed rafters by lateral bearing strips and top battens, the parts being interlocked rigidly.

NEW TEXTILE MACHINERY.

APPARATUS FOR BOILING AND DYEING SILKS, ETC.

Lewis Leigh, Pittsfield, Mass.—This consists in the combination of the series of fingers, their connecting rods, and an operating mechanism, with the two vats for moving the rods that support the material being boiled or dyed, and in the combination, with the end of the outer vat, of a box, connected with the space between the two vats by an opening. The box receives the wash from the ebullition of the liquid in the first vat, and, being higher than the said vat, allows the liquid to flow back into the same, thus avoiding any risk from boiling a liquid in an airtight space.

IMPROVED SPINNING AND DOUBLING MACHINERY.

John L. Taylor and Robert Ramsden, Bolton, England.—This invention relates to the machines known as throstle spinning and double frames, and consists in imparting a positive motion to the bobbin on which the yarn or thread is wound, and a variable motion to the inverted fier, which is fixed to a bush, bearing upon a flannel or other washer placed on the lifting rail. The advantages claimed for the improvements are: First, no oil is required for the spindle to lubricate the bobbin after doffing, as heretofore; secondly, no snarling of the yarn on the top of the spindle can take place; thirdly, no friction of thread against the fier leg; fourthly, no removal of fiers when doffing; fifthly, a great saving of waste is effected, and of time in doffing, and the bobbins can be doffed while the frame is going; and, lastly, as the bobbins bear upon metal plates, they are not liable to be saturated with oil, and consequently no oil can penetrate to the yarn on the bobbin, as heretofore.