

## NEW BOOKS AND PUBLICATIONS.

**AERIAL NAVIGATION.** By the late Charles Blachford Mansfield M. A. Edited by his brother, R. B. Mansfield. Price \$5.00. New York city. Macmillan & Co., 21 Astor Place.

This is a curious book. It is probably the most elaborate treatise on its subject extant; yet it is written by one who never made a balloon ascension in his life, never saw more than half a dozen balloons, never made any long study of the question, and so on through a series of negatives which would imply utter ignorance of the whole subject attempted to be considered. The work is, therefore, due to a kind of inspiration, an inventive frenzy it would appear, and the author says he writes it "simply to deliver my brain of a burden which came upon it uninvited." The volume is divided into two parts; the first is devoted to the statement of the problem of aerial navigation, the second to suggestions for solving that problem. Some of the author's opinions we reserve for more extended review. As a whole, the book is dissatisfying. Its writer died before completing it. Hence the most important (concluding) part is but in fragmentary state, while the text is written with a diffuseness and redundancy of language which shows the absence of the final condensing and pruning which it would doubtless have received at his hands. Mr. Mansfield moreover died twenty-five years ago, and the volume takes no account of recent progress in aeronautics. The work, however, contains much that may be read with profit, especially those parts relating to form and propulsion of balloons, while its appendices include much valuable information relative to weight of materials, buoyancy of gases, etc.

**THE APPLICATIONS OF THE PHYSICAL FORCES.** By Amédée Guillemin. Translated from the French by Mrs. Norman Lockyer; Edited, with Notes, etc., by J. Norman Lockyer, F.R.S. Illustrated. Price \$12.50. New York city: Macmillan & Co., 21 Astor Place.

This work is devoted to the popular exposition of the practical applications of the laws of physics; and the publishers have left nothing undone, in the way of exquisite engravings (some beautifully colored), elegant paper, binding, and printing, to make the volume thoroughly attractive. The translator's work is excellently done; the editor's, with the exception of a few oversights such as "Hero's" fountain for "Hera's," with judgment and care. The volume is divided into five books, respectively relating to phenomena and laws of weight, acoustics, light, heat, and magnetism and electricity, the information given being brought up to very recent dates. To readers who, not having had the advantages of a scientific education, desire a good general idea of practical physics, we can cordially recommend this work. It has few technicalities, goes over an immense field, and neglects nothing that is important; and it is plainly and pleasantly written. It is especially well adapted to meet the needs of young students of science.

**RECENT ADVANCES IN PHYSICAL SCIENCE.** By Professor P. G. Tait. Second Edition, revised. Price \$2.50. New York city: Macmillan & Co., 21 Astor Place.

The lectures of which this volume is composed were delivered by Professor Tait before a number of professional men of Edinburgh, who wished to obtain a notion of the chief advances made in natural philosophy since their student days. The present is the second edition of the work, and has been subjected to careful revision. The volume is chiefly to be recommended on account of its containing a thoroughly admirable disquisition on the nature of energy, from the time of Newton up to the very latest modern researches; the whole being explained and elucidated in a masterly manner. The chapters on transformation of energy and transformation of heat into work are exceptionally good; and we commend them to the careful perusal of all engineers who would be well grounded in the theoretical part of their profession. The new chapter on force, added to this edition, we have already reviewed in detail.

Messrs. S. S. Woodman & Co., 119 and 121 William street, New York city, are the publishers of Mark Twain's new "adhesive scrapbook." The erudite author, explaining his production, says: "I have invented and patented a new scrap book, not to make money out of it, but to economize the profanity of this country. You know that when the average man wants to put something in his scrap book he can't find his paste—then he swears; or if he finds it, it is dried so hard that it is only fit to eat—then he swears; if he uses muilage, it mingles with the ink, and next year he can't read his scrap—the result is barrels and barrels of profanity. This can all be saved and devoted to other irritating things, where it will do more real and lasting good, simply by substituting my self-pasting scrap book for the old-fashioned one." This is very true so long as the purchaser does not meditate over the title of the work; but if he does, and misled by the same tries to make the book adhere, he will miserably fail. The pages are exceedingly sticky and the postage stamp paste is excellently put on. The work will hold scraps with intense tenacity, and generally is commendable in all respects; but still there is that subtle confusion in the title which might lead the unwary to try to cause the volume to adhere to a wall or desk, and, on failing, to make the cursory remarks which Mr. Twain hates to see misapplied. Price from \$1.25 to \$3.50, according to binding.

## Inventions Patented in England by Americans.

From December 22, 1876, to January 15, 1877, inclusive.

**BOILER.**—C. V. Lloyd, Decorah, Iowa.  
**BOILER FURNACE.**—A. F. Upton, Boston, Mass.  
**BOOT, ETC.**—L. R. Blake, Boston, Mass.  
**BRECH-LOADING GUN.**—C. H. Pond (of Bridgeport, Conn.), London, Eng.  
**BUTTON HOLE SEWER.**—E. Remington & Sons, Iliou, N. Y.  
**CAR TRUCK.**—E. H. Horsey, Chicago, Ill.  
**COMPRESSING INGOTS.**—D. McCandless, Pittsburgh, Pa.  
**DRYING BONE-BLACK.**—L. Colwell, New York city.  
**ENGRAVING MACHINE.**—A. H. Watkins et al., Boston, Mass.  
**FASTENING BOOT SOLES, ETC.**—G. V. Sheffield, Brooklyn, N. Y.  
**HORSESHOE NAIL, ETC.**—J. M. Laughlin, Boston, Mass.  
**KNITTING NEEDLE.**—W. Corey, Manchester, N. H.  
**MAKING BUTTONS.**—C. Radcliffe, Newark, N. J.  
**MAKING FARINA, ETC.**—C. Morrill (of Baltimore, Md.), London, England.  
**MAKING HOSE.**—J. V. D. Reed, New York city.  
**MALT SYRUP, ETC.**—O. F. Boomer et al., Brooklyn, N. Y.  
**MULTIPLY TELEGRAPH.**—G. B. Prescott, New York city.  
**OXYGEN FOR COMBUSTION.**—C. Hornbostel, New York city.  
**FLOW HANDLE, ETC.**—W. S. Babcock, Windham, Conn.  
**PRINTING PRESS.**—I. L. G. Rice et al., Cambridge, Mass.  
**PULLEY.**—A. Montgomery, New York city.  
**REDUCING ORES, ETC.**—T. S. Blair, Pittsburgh, Pa.  
**REMOVING BOILER SEDIMENT.**—T. F. Strong, Brooklyn, N. Y.  
**ROCK DRILL.**—W. Weaver, Phoenixville, Pa.  
**SAFETY LATCH.**—G. C. Setchell, Greenville, Conn.  
**SCHOOL DESK.**—W. Rose, New York city.  
**SEWING MACHINE.**—S. W. Johnson, New York city.  
**SHUTTLE.**—W. E. Whitehead et al., Lowell, Mass.  
**SKIRT ADJUSTER.**—A. S. Gear, Boston, Mass.  
**SPRING MOTOR.**—I. Solomon, Solomon's Island, Md.  
**STEAM HEATER.**—J. Wilcox, New Haven, Conn.  
**STONE DRESSING TOOL.**—J. Hartnell, N. H.  
**STRAIGHTENING BARS, ETC.**—D. McCandless, Pittsburgh, Pa.  
**TABLE CUTLERY.**—W. Eccleston, New York city.  
**WASH BASIN, ETC.**—A. G. Myers, New York city.  
**WATCH CASE SPRING.**—J. Britton, San Francisco, Cal.

## Recent American and Foreign Patents.

## NEW MECHANICAL AND ENGINEERING INVENTIONS.

## IMPROVED BALE TIE.

Peter Harden, New York city.—The free end of the band is coiled upon itself by means of a turning key or other suitable device, and the coil being on the under side of the slotted buckle, it serves to hold (by friction) the other end of the band which is looped around the buckle, but not riveted. Thus, both ends of the band are locked by the coil. The band can be drawn very tight, and all slack taken up, so that the bale is held compressed in place of being allowed to expand so soon as released from the press, as usual heretofore.

## IMPROVED SPIKE PULLER.

Joseph Douglass, McConnellstown, Pa.—This invention relates to an improved device for extracting railroad spikes. It consists in a sliding fulcrum arranged to rest upon the surface of the rail, provided with legs to prevent it from turning, and having upon its upper surface graduated steps of increasing elevations arranged part upon one side and part upon the other of the plate, and in connection with which a lever carrying a pivoted grapple is adapted to operate; the grapple being arranged to clutch the heads of the spike, while the lever is operated upon the different steps of the sliding fulcrum, beginning with the lowest near the spike and working toward the highest until the spike is extracted.

## IMPROVED SOLDERING MACHINE.

Peter Dillon and John Cleary, Sherbrooke, P. Q.—The two plates comprising the body of the can are bent into suitable shape by a divided die. The solder is discharged through the hollow soldering tool as its valve opens when the bath of molten solder moves forward and the soldering tool passes over the side seam of the can. The bottom of the can is soldered by a hollow tool when the can is raised and rotated in suitable manner.

## IMPROVED PEG FLOAT.

Tilghman F. Lippengood, St. Louis, Mo.—The cutter proper is reciprocated by a vibrating lever operated by a crank. The cutter is reversible on its bearing to adapt it to rasp and remove the ends of the pegs both at the heel and toe of a boot or shoe. It is secured in either position by means of a spring catch or locking device.

## IMPROVED PUMP VALVE.

Garret D. Hopper and William H. Laufkotter, Sacramento, Cal.—The invention consists in the valve stem, made rectangular in its lower part and round in its upper part. Across the lower part of the valve box passes a crossbar, through which is formed a rectangular hole which receives the valve stem. Across the upper part of the box is formed another crossbar, so placed that the shoulder of the stem may strike it, and the upward movement of the valve be thus limited. Upon the stem is formed a second shoulder, against which the valve is clamped by a nut. By means of a bail the valve can be lowered into, and raised from, its place by a hooked rod.

## IMPROVED NUT LOCK.

Frederick Swingly, Bucyrus, O.—An ingenious device for preventing the bolts from working loose in railroad joints, and in other places where they will be subjected to an intermittent or continuous jarring. It consists in the combination of two or more nuts with each other, in such a way that the backward movement of either will tend to move the other forward, causing them to mutually lock each other. This is one of the simplest inventions for the purpose that have come under our notice.

## IMPROVED CAR COUPLING.

Hermann Wittmann, Manitowoc, Wis.—Accidents to brakemen while coupling cars are among the most common on railroads. The present invention aims to prevent these in great measure by improving the common draw-heads so that the link may be readily and conveniently guided to the opposite draw-head by the brakeman without danger of injury to the hand. The invention consists of a draw-head with a swing bar, pivoted to screw pins at both sides, near the lower part of the same. The swing bar is bent of one piece of rod iron, with side extensions. The pendent position of the swing bar, when the cars are coupled, prevents any damage to the same, as it is entirely out of the way.

## IMPROVED MACHINE FOR FORMING SHEET METAL TUBES.

Abner C. Goodell, Salem, Mass., assignor to Mortimer M. Camp and John E. Searles, Jr., New Haven, Conn.—This consists of an endless belt of suitable strength, that is revolved by a driving roller mounted in a sliding carriage, and applied to a detachable tube-forming mandrel by top and bottom stretching rolls. The sheet metal blank is fed to the mandrel by being introduced between it and the belt, and formed by lapping around the same. The tubes are thus formed of any required length and thickness, as rapidly as the blanks may be fed and the tubes removed.

## IMPROVED PRESS FOR TOBACCO AND OTHER ARTICLES.

William H. Malone, Farmington, Ky.—This is a strong yet simple and inexpensive press, constructed substantially as follows: A lever is pivoted in one of the upright ends of the frame, and moves in a slot in the opposite end of the frame. The said slot has ratchet racks, which are engaged by pawls attached to the end of the lever. There is also a lever which is fulcrumed in the said frame, and carries a ratchet bar that engages with, and moves, the first mentioned lever; and there is a device for raising the main lever after the bale has been pressed.

## IMPROVED BOILER.

Robert Excell, Chicago, Ill.—This is a tubular saddle boiler for heating greenhouses and for other purposes. It consists of a semicircular boiler with longitudinal flues arranged therein, in connection with a lateral fire-back at the bottom, and a lateral circulator at the top part of the boiler, between which the fire passes from the fireplace back to the flues. The boiler communicates by top-flow tubes above the circulator and return tubes at diagonal ends with the heating tubes. The heat of the fire is first exerted on the front section of the boiler, next on the circulator and generator, then on the rear part of the boiler, and finally by the passage through the flues, utilizing thereby quite fully the heating capacity of the fire.

## IMPROVED SEWING MACHINE.

Lyman Robinson, Matteawan, N. Y.—The object here is to adapt a sewing machine for sewing on the binding of the brims of stiff hats, which, up to this time, have been sewed by hand. The needle and the presser-foot project outward from the head in which the bar works, to allow room for turning the crown of the hat over toward the head. In this way the needle and presser-foot can work on the upper side of the brim along the sides, which are curved up toward the crown.

## NEW WOODWORKING AND HOUSE AND CARRIAGE BUILDING INVENTIONS.

## IMPROVED VEHICLE SPRING.

William W. Sayers, Harrodsburgh, Ky.—The object of this invention is to provide for buggies, top carriages, or other light vehicles, a spring which shall be superior in point of elasticity, lightness, strength, and durability, and also adapted to prevent rocking motion of the body of the vehicle. The invention relates chiefly to the use of end cross-springs, which are connected with the brackets or scroll springs that support the side springs of the body.

## IMPROVED COMBINED POLE AND SHAFT.

William H. Hiteshew, Peru, Ind.—This is a contrivance of the shafts and their connecting devices whereby they may be readily shifted into suitable position for forming a pole for two horses. The shafts are pivoted to braces, so that they may be swung around to the center for use as a pole, or to the side. The shafts are connected at the outer ends, when used as a pole, by a metal point which has a kind of double clamp socket that slips on the ends, and fastens by an eccentric ring, or other device. The shafts are also connected together in this position by a plate.

## IMPROVED METHOD OF VENTILATING BUILDINGS.

John F. Cameron, South Brooklyn, assignor to Elizabeth W. M. Cameron, Brooklyn, N. Y.—The impure air that rises to the top of the room passes through plates and spouts into a space between true and false ceilings, and thence into the cavities of the cornices and out through the pipes, the spouts preventing its return into the room. A number of new

devices are embodied which may be recommended to the notice of architects and sanitary engineers.

## IMPROVED VENTILATOR.

John Sandall, Jr., St. John, N. B.—This is a simple ventilator for railway cars which works efficiently without regard to the direction in which the car may be moving. It consists, essentially, of a case projecting laterally from the side of the car, with an opening on two sides, into a passage which curves from the side to the outer end. The two passages unite with each other a short distance from the outlet, where there is also the outlet of an exit passage from the car. In this passage draft is established by the air rushing through one of the side passages, and making a vacuum in the middle passage from the car. At the junction of the passage is a valve, which is opened automatically to the advancing side, and closed to the other side, by the wind.

## IMPROVED PROCESS FOR MAKING WOODEN SCOOPS.

Robert Richardi, Belleville, Ill.—An ingenious mode of turning scoops out of a single piece of wood. The block is first turned in the form of a goblet and then hollowed out at the scoop part. The inclined handle is cut and turned from the smaller rear portion, and finally the edges of the scoop are finished off.

## NEW HOUSEHOLD INVENTIONS.

## IMPROVED EASY CHAIR.

Henry Parker, Osawatomie, Kan., assignor to himself, Ammi A. Brown, and Frank A. Lauter, of same place.—This improvement consists in pivoting the back of the chair to a supporting frame, and pivoting the back, bottom, and foot pieces together, so that the back and foot pieces may be placed at any angle between a horizontal and vertical position. The parts are attached in such a manner that the back and foot piece are always parallel to the same line. The chair will doubtless prove useful for dentists and barbers, and also as an easy or invalid chair.

## IMPROVED LAMP EXTINGUISHER.

Leonard H. Pilger, Philadelphia, Pa.—This consists of a fulcrumed lever and slide rod at the under side of the burner. The lever extends below the collar of the bowl, to form contact with the same on detaching the collar, and to raise thereby the slide rod and a weighted extinguisher tube sliding on wick tube. A guard piece opposite the lever assists the working and re-inserting of the lever into the bowl. Anatomically operating attachment is thus provided, which extinguishes the light even in case the person filling the lamp neglects to extinguish the flame before unscrewing the burner. It thus forms a good preventive against accident.

## IMPROVED WEATHER STRIP.

David O. Hink, Maryville, Mo.—This is a new weather strip for outside doors that adjusts itself in automatic manner on the sill, so as to give protection against the entrance of moisture in stormy weather. A drop with a raised round knuckle is attached to a bed piece, and applied at suitable distance from the bottom edge of the door. The bed piece has a concave groove and is so constructed as to form a projecting lip, in which the knuckles of the drop swing, being held in position by means of hinges embedded in the knuckle-joint, thus forming a continuous knuckle hinge.

## IMPROVED GAS LIGHTER.

Eddy T. Thomas, Boston, Mass.—This is an exceedingly ingenious device which automatically turns on, ignites, and extinguishes the gas at any desired hours. It consists of a clockwork train arranged in connection with a dial, the latter spaced off for 24 hours. By this dial the mechanism may be adjusted in accordance with the hours when it is desired to light and extinguish the gas. The apparatus when set in motion, at the regulated time turns on the gas, and removing a match from a receptacle, lights it, and ignites the gas. Subsequently, at the hour desired, it turns the gas off. The device may be moved and set once a week to the required time.

## IMPROVED WASHING MACHINE.

Joseph O. Beauperland, Fall River, Mass.—The novel feature in this device is a metallic cylinder, having longitudinal corrugations, in the internal concavities of which octagonal rollers are sustained, being journaled in the cylinder heads. Clothes and a quantity of hot or cold water are introduced through the doors in the covering and in the cylinder, and secured therein by closing and fastening the doors. The cylinder is then rotated, and the by constantly falling toward the lower portion of the cylinder over clothes, the roller, soon become cleansed.

## IMPROVED WEATHER STRIP.

Jesse Chandler, Warsaw, Ill.—A timely invention intended as a means for excluding cold and rain from windows and doors. It consists of a strip of metal or wood, which is movably attached to the door by the staples, and is of such length as to fit loosely between the jambs of the door. It is placed in a rabbet at the lower edge of the door, and is of sufficient width to drop into the rabbet in the threshold when the door is closed. On opening the door the strip strikes the block, which throws it upward until it engages the catch, by which it is retained until the door closes, when it is allowed to fall into the rabbet in the door sill.

## NEW AGRICULTURAL INVENTIONS.

## IMPROVED CHURN DASHER.

Chapman J. Syme, Petersburg, Va.—The invention relates to certain improvements in churn dashers, designed to churn the butter more rapidly by producing a larger degree of agitation in the cream. It consists in the particular construction and arrangement of a conical or funnel-shaped dasher, having a socket to receive the handle and provided with a perforated plate near its apex upon the outside, and a second perforated plate attached to a rod upon the inside.

## IMPROVED CORN SHELLER.

Zadok T. Blackwell, Carrington, Mo.—A useful invention for farmers, by which the corn is rapidly separated from the cob and the cob expelled. It consists of a toothed revolving cylinder of slightly tapering shape, to which the ears of corn are fed from a hopper by a reciprocating slide with step-shaped surface. The ears drop on spring acted pressing pieces, that carry the same along the clearing teeth, and, finally, by means of a roller of the spring piece, through an exit aperture of the sheller frame, to the outside. A small outside hopper, with opening near the lower end, conducts any corn that may pass out with the cob back into the sheller. The special feature of the invention is that the cylinder enlarges as the cob in its progress becomes stripped of its corn.

## IMPROVED PLOW.

Samuel Huber, Danville, Pa.—In order to fasten the share or point of the plow without bolts, this inventor attaches the share to the plow by means of a projecting finger or dowel that fits into a corresponding aperture in the mold board, and locks the share by means of a dovetail in the beam and land side. The advantages of this method are that, as no bolts are required, the surface of the share may be smooth and entire. The usual danger of breaking the share by tightening the bolts is thus obviated, and it is not liable to become accidentally loosened.

## IMPROVED CULTIVATOR.

Philip Studer, Mechanicsville, Iowa.—This is an improved machine for cultivating corn and other crops planted in hills and drills. It is so constructed that the plows may be readily adjusted toward or from the plants, and raised from the ground for passing from place to place. The new features relate mainly to improved construction of frame and braces.