

NOVEL STEAM MOTOR.

The engraving shows one of the small steam motors recently brought into use. This is especially designed for the purpose of churning. The steam pressure is exerted against a flexible diaphragm, A, which presses against a convex abutment projecting from the lever, B. The engine is single acting, the lever, B, being forced upward by the steam, and returned by a weight on the end of the lever near its connection with the churn dasher rod.

The entrance and exit of steam to the chamber of the diaphragm, A, is controlled by a valve, C, worked by an arm, D, on the fulcrum of the lever, B, through the agency of a pivoted triangular frame, E, having pins which strike the arm on the valve spindle. As this device alone would only partly open or close the valve, the inventor has applied to the triangular frame a double acting spiral spring, which completes the movement of the triangular frame, E, and insures the complete opening and closing of the valve.

The upper pipe connected with the valve chest is the supply and the lower one the exhaust pipe. As steam is alternately admitted to and exhausted from the space beneath the diaphragm the lever, B, is oscillated, working the churn dasher. The internal construction of the motor will be seen in Fig. 2, which is a vertical section through the center of the steam chest and diaphragm.

This invention was recently patented by Mr. T. Mayhew, of this city.

THE PROFILOGRAPH.

The instrument shown in the annexed engraving, which we take from *La Nature*, is the invention of Mr. Dumoulin, of Paris, and is used in obtaining the profile of a country. The instrument consists of a frame supported by four wheels, which may be adjusted rigidly in any desired position, but as a rule are arranged so that the movements of the machine do not deviate from a right line. The carriage supports a small table, upon which a sheet of paper is unrolled, parallel to the length of the table, for the purpose of receiving the drawing or tracing of the profile of the country traversed. The profile is drawn by a pencil or pin held perpendicularly above the table.

The entire mechanism of the instrument is operated by an endless chain, which is driven from the rear wheels or axle. An iron bar is suspended from the frame of the machine and is provided with a large metal ball at its lower end, forming a pendulum. If the carriage ascends or descends the pendulum will always maintain its vertical position, and it is only the machine that is inclined, and these alternate and variable inclinations produce either positive or negative displacements, accordingly as the machine ascends or descends.

These angular oscillations, which are transmitted by proper devices, determine the trigonometric law of the reciprocating movements of the paper and the pencil. The pencil mark is a resultant, for the sheet of paper moves positively, and this movement is constantly proportional to the cosines of the angles formed by the pendulum with the normal grade line of the country traversed, and the crayon rises and falls perpendicularly to the sheet of paper, the distances it rises and falls being proportional to the sines of the above angles, and the tracing obtained is nothing but a profile of the several angles. The apparatus does not only give an exact tracing of the profile of the country, in the scale of $\frac{1}{1000}$ for the horizontal dimensions and $\frac{1}{100}$ for the vertical dimensions, but it also records the distances traversed; that is, the figures of the horizontal dimensions or abscissas and of the vertical dimensions or ordinates.

The operation of the device is exceedingly simple, for one man draws the carriage along the line of the profile desired and the surveyor or superintendent accompanying the carriage stops it at every rod or post, notes the lengths shown on one of the indicators or counters, then draws a vertical line and notes the heights shown by the second indicators. He then proceeds and repeats this operation at each post. It is evident that an accurate profile can be obtained in a shorter time and with less expense than by the usual methods. It has been proposed to use this instrument in the government surveys in France.

MECHANICAL INVENTIONS.

Mr. William M. Thompson, Jr., of Barnhart's Mills, Pa., has patented an improved piston packing, which consists in wrapping the packing rope of a piston on a taper from the middle toward each end, so that it may be more readily inserted in the barrel and drawn out without catching on the tube joints.

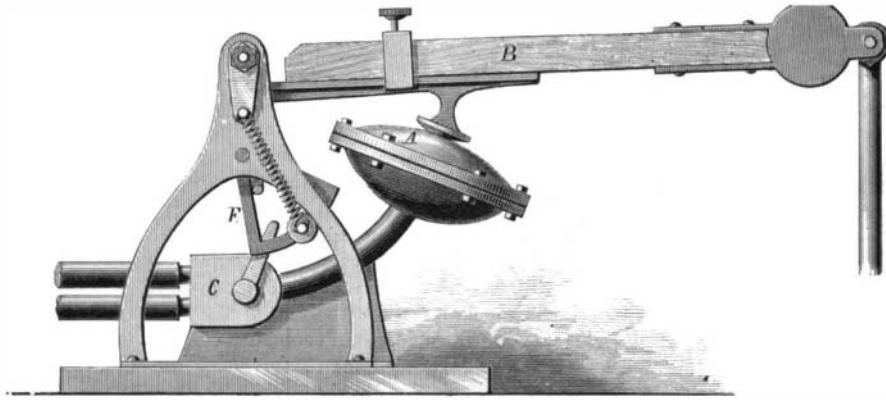


Fig. 1.—MAYHEW'S STEAM MOTOR.

Mr. Nelson Rogers, of Elgin, Ill., has patented certain improvements in jars of that class which are employed for holding fruits, vegetables, butter, milk, etc., and which are designed to be hermetically sealed. It is an improvement in that general form of jar in which a glass cover is made to rest inside the neck of the jar upon a shoulder, and the joint

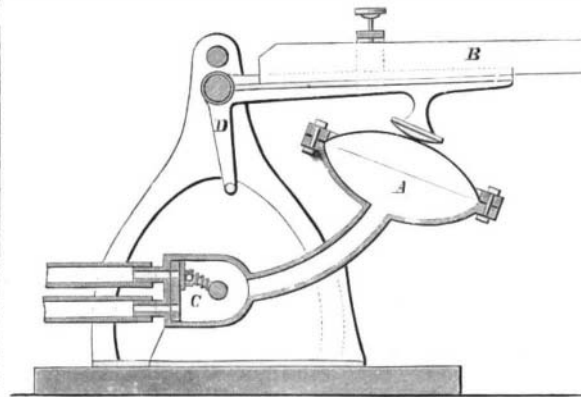
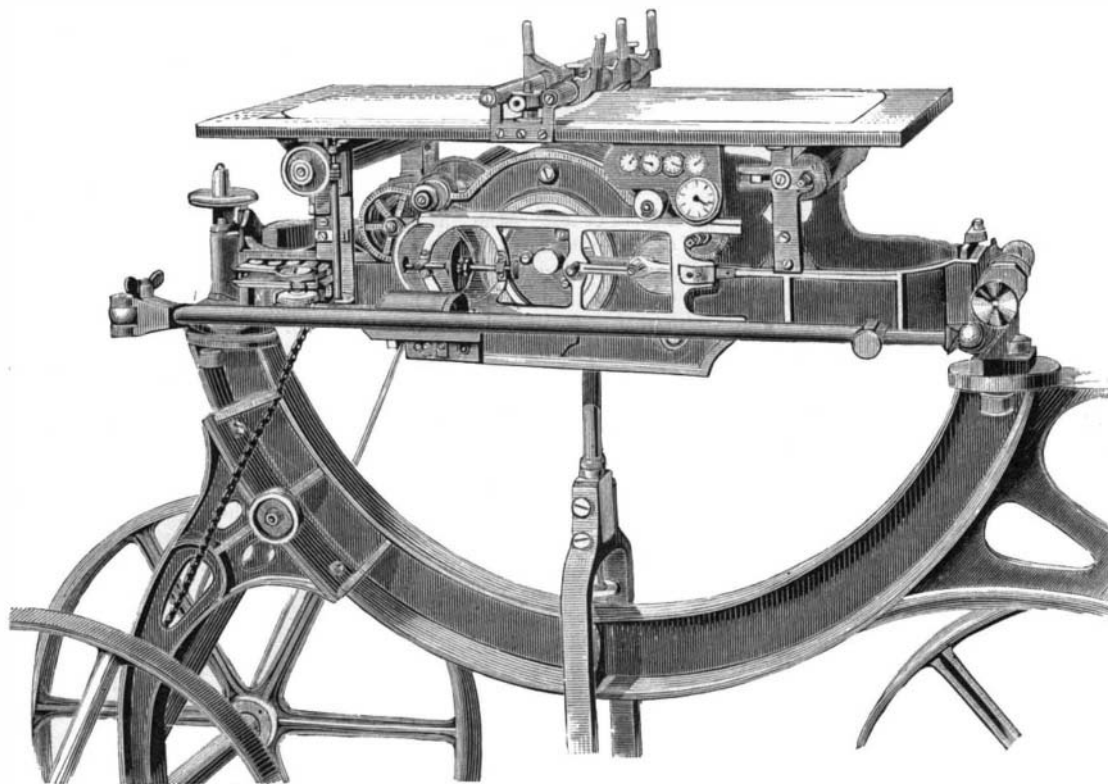


Fig. 2.—NOVEL STEAM MOTOR.

made tight by an elastic ring and a screw cap. The improvement consists, mainly, in forming the glass cover with a recess about its upper edge, placing therein a ring of cork or other elastic material, and then fastening an angular annular screw cap over the flush edges of the glass cover, the elastic ring, and the edge of the jar, so as to hold the parts to their place and make a tight joint.

Mr. James B. Cook, of London, Ontario, Canada, has



THE PROFILOGRAPH.

invented a lock having a permutation wheel of novel construction, having pinholes carrying two or more pins, which release the bolt by their successive action when properly operated. The wheel also has a click for indicating the movement by sound, and a device that resets the lock or prevents movement of the bolt in case the wheel is improperly operated.

Mr. James Hall, of Glen Cove, N. Y., has patented an

improved fastening for cans, which consists in a staple and plate of novel construction, especially adapted for application to milk cans as now made, as a permanent fixture, to be used with a padlock or other device to secure the cover.

Mr. David Bissell, of Detroit, Mich., has patented a bevel square in which the head can be set at any required angle quickly and with certainty, which contains in the stock or handle a pocket for the reception of a combined marker and screwdriver. It consists of a graduated arm pivoted at one end to the end of the handle opposite the head, by which, when thrown out of the pocket in the handle, the head is set to the required angle, and, lastly, of a pocket in the handle for the reception of the combined marker and set screw, provided with a rubber cushion for holding it in the pocket.

A useful pocket tool combining in one device the functions of several frequently used and desirable tools, has been patented by Mr. James H. Randell, of Acworth, Ga. It consists in a hollow metal handle formed with a shoulder to act as a square or gauge, and graduated in inches to form a rule, in combination with a blade sliding

longitudinally into the chamber of the handle, having a series of saw teeth on one side, a cutting edge on the other, and a screwdriver point, the handle being made with a longitudinal slit, through which a lug or stem projects from the sliding blade and carries a tilting catch, by which the blade may be slid in or out and secured in either of the positions.

In the transfer of grain from railroad cars to elevators time is a most important element, and many labor and time saving methods and appliances have been adopted for the purpose of economizing in this direction. It is common now to lay a double track opposite the elevator and to sink a pit or pits between said tracks, into which pit or pits the elevating buckets are made to descend, so that the grain can be shoveled from the cars into these pits, and be thence elevated directly into the elevator building, the trains of cars being moved along at short intervals of time as one car is emptied, to bring the next succeeding one opposite the pit into which the car load is to be discharged. Mr. Stephen R. Kirby, of New York city, has patented a better and more effective device for this purpose. It consists of an endless chain or belt stretched over two chain pulleys or drums, and revolving between guides or in a long box that is fixed, preferably, in an upright or nearly upright position, the chain being provided at two opposite points in its length with lateral ears; a sliding plate or counterbalance moves in grooves in the guides, and is designed to be connected by a rope with one or more grain shovels or scoops, and the sliding plate is provided with lugs on its under face, with which the ears of the chain engage twice in each revolution, and thereby move the plate at each half revolution the length of the guide, and then release it so that the said plate may fall or be drawn back again.

An improved baling press, patented by Mr. Charles T. Christmas, of Riverton, Miss., is so constructed that the movement of the follower will diminish gradually in speed and extent, and the compressive power will increase in proportion; and as the levers come more into a perpendicular position the parts will be more capable of withstanding the strain, as the force will then be applied endwise of the levers.

Mr. Julien P. Wood, of Marlborough, Mass., has patented a novel construction of machines of that class in which the eyelet hole is punched and the eyelet set in one and the same operation; and it consists of a peculiar construction and arrangement of parts, in which the punch first descends upon a bed plate and cuts the hole, and then, without rising, passes laterally over a subjacent setting tool to feed the material. This material is then clamped by a presser foot, while the punch and bed separate and retreat laterally. An upper setting tool having the same

lateral motion with the punch is then brought over the hole, after which the subjacent setting tool rises, catches an eyelet from a feed trough or chute, and then closes into the hole with the upper setting tool, to expand and set the eyelet.

A novel machine for blacking and polishing boots and shoes, while on the feet, has been patented by Mr. Pierre Paul Audoye, of Paris, France. It may also be used as well for harness, and, generally, for any articles that have to be polished.

Straw Thrashing in California.

The San Francisco *Alta* describes the process by which most of the wheat of California is thrashed by steam, usually the day it is cut.

The sickle is set on a level with the bottom of the lowest heads of grain, so as to take off no more of the straw than is necessary. From the platform behind the sickle the grain is carried by an endless apron or elevator into a wagon driven alongside the header; and this wagon, relieved by another at short intervals, transports the grain to the thrashing machine, which is not infrequently moved from one point of the field to another, so as to be near the header. Or, if the thrashing is to be done after the cutting, the header wagons throw their loads into piles, very different from the stacks carefully built of sheaves in those climes where rain is frequent in summer, and where the thrashing may be delayed until late in the fall. The management of the steam thrashing machine is usually the exclusive business during July, August, and September of its owner. If the machine is one of the ordinary size, he expects to thrash about 1,660 bushels—100,000 pounds—in a day; that is, if the crop is heavy and the circumstances favorable. He employs a dozen men, who are ordinarily boarded by the farmer, and he receives from 5 to 8 cents per bushel for thrashing. His total daily expenses may be \$60, and his average gross receipts twice as much per day. He gets his pay on the basis of the weight of the grain as sacked, and the more soil, gravel, cheat, and other material that should be included, the greater his profit. If he thrashes the grain directly from the header wagon, there is little opportunity to get gravel in; but if the grain is fed to the thrashing machine from a pile on the ground, many shovelfuls containing as much soil as grain are fed into the machine. The foreign buyers complain to the shippers of the gravel, and the shippers to the farmers; but the remedy does not appear near at hand, for the evil is part of a complicated system. The thrasher may have \$3,000 invested in his machine, wagons, horses, and tools needed for traveling and working; and as he hires and manages a dozen men, and has but a short season of thrashing, he must make a good profit. The business demands much skill in the control of machinery and men, and great care to prevent fires and accidents, so that the average profit is not unreasonably large. The charge for thrashing is low, because the farmers generally have preferred that the work should be done with haste rather than with care.

A NEW VELOCIPEDE.

The engraving shows an improved velocipede more especially designed for the use of children. It is propelled by the hands, and may be steered by either the feet or hands. The body of the velocipede is preferably made in the form of a horse, but it may be made in a variety of other shapes, such as that of a carriage body, a chair, etc. The rear portion of the body is supported upon two wheels placed on axles, A, which are entirely independent of each other, and carry at their inner ends spur wheels, B, which are connected by endless chains with spur wheels on two independent shafts, C, journaled in the neck of the horse, and provided with hand cranks by which they may be turned.

The forward portion of the velocipede body is supported by a caster wheel, whose shank, D, is jointed and provided with an arc-shaped slot, having a notch at each end for receiving a transverse bolt passing through the pintle of the caster wheel. By means of this device the axle of the caster wheel may be placed as shown in Fig. 1, or it may be placed directly under the pintle, as shown in Fig. 3, when the wheel will be turned in the operation of steering by means of a foot lever or tiller pivoted under the body of the horse. This lever carries a strap which passes around a drum or pulley on the pintle of the caster. When the strap is not in use it may be hooked up out of the way. The arrangement of the working parts may be seen in Fig. 2, which is a partial plan view with the figure of the horse removed.

This invention will be appreciated by the youngsters, and will make a pleasing change after using the velocipede propelled by the feet, and with this machine the arms and chest will be developed.

It will be noticed that the rear or driving wheels are driven independently, and that one may be driven faster or slower than the other to steer the machine.

This invention was recently patented by Mr. Alfred Vick, of Mount Carmel, Conn., and will be manufactured and introduced by the "American Cyclepede Co." For further information address Theo. J. Harbach, 809 Filbert street, Philadelphia, Pa.

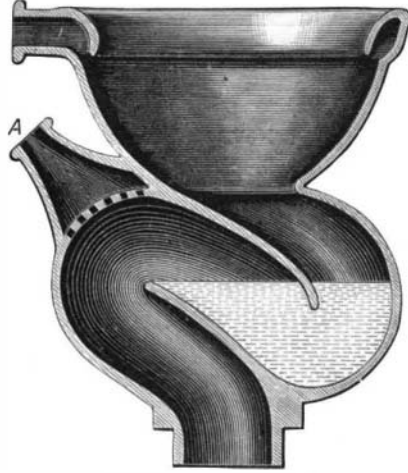
Banana Fiber.

Mr. Thomas J. Spear, of New Orleans, has been experimenting for many years with Southern plants with a view to their utilization in the manufacture of paper. The banana, he thinks, is the most valuable, as it grows with

great rapidity, is nearly all fiber, never requires replanting after once a start has been made on a piece of ground, enriches the soil, and needs no cultivation. All that is required to do with it is to let it grow until frost, then cut and strip out the fiber. The plant grows to the height of ten or fifteen feet, and an acre planted in banana plants would yield eight or ten tons of fiber, out of which a paper equal, he thinks, to linen or hemp can be made.

IMPROVED CLOSETS.

The "complete" sanitary closet manufactured by Messrs. C. Winn & Co., Birmingham, is of a most simple and reliable character. It is made entirely of one piece of earthen-



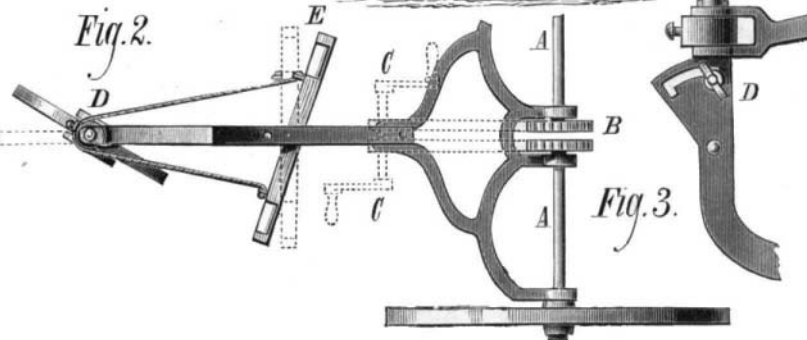
IMPROVED CLOSETS.

ware, and a reference to the accompanying sectional illustration clearly explains the arrangement. It is trapped above the floor line, is narrowest at the inlet, rendering stoppage scarcely possible. At the apex of this trap a deodorizing chamber is provided, to be filled with charcoal in connection with the ventilating outlet, A. The area of the closet for solid matter is very small, and there are no spaces where soil can in any way lodge or accumulate. The flushing apparatus, which, it will be understood, is an independent pump, having no connection with the closet except by the inlet pipe, is of the best known kind, and the force of water is concentrated where most required. After use, the whole of the water, soil, etc., passes from sight. We understand these closets are giving great satisfaction wherever fixed. This firm also make another on the same principle,

Fig. 1.



Fig. 2.



VICK'S CYCLEPEDE.

called a slop closet, having a strong grating over the outlet, which prevents the loss of anything thrown in by accident.

Give the Boys Tools.

Almost all boys are naturally mechanics. The constructive and imitative faculties are developed, in part, at a very early age. All boys are not capable of being developed into good, practical, working mechanics, but most of them show

their bent that way. There are few cases in which the boy has no competent idea of the production of a fabricated result from inorganic material, but such cases are rare. Given the proper encouragement and the means, and many boys whose mechanical aptness is allowed to run to waste, or is diverted from its natural course, would become good workmen, useful, producing members of the industrial community.

The mechanical boy ought to have a shop of his own. Let it be the attic, or an unused room, or a place in the barn or the woodshed. Give him a place and tools. Let him have a good pocket knife, gimlets, chisels, gouges, planes, cutting nippers, saws, a foot rule, and material to work. Let the boy have a chance. If he is a mechanic it will come out, and he will do himself credit. If he fails he is to follow some calling that does not demand mechanical skill.—*Boston Journal of Commerce.*

MISCELLANEOUS INVENTIONS.

An improved oil can top, which is so constructed that the oil that drips from the spout is returned into the can, has been patented by Mr. John R. Bennett, of Nunda, N. Y. The invention consists of a valve plug attached to a lever pivoted on the bottom plate of the spout, which closes a drip hole in an annular drip cup at the bottom of the spout when the lever is depressed.

An improvement in car brakes has been patented by Mr. Christian Ammarell, of East New York, N. Y. The object of the invention is to operate a car brake by a single spring and to lock the main lever of a car brake.

Mr. Stephen D. Field, of New York city, has patented a mechanical means for vibrating the tongue of a telegraph sounder or relay, and actuate the same by increase and decrease of current, or by making and breaking the circuit. The invention consists in a tongue fitted to vibrate between fixed points by the action of clockwork or other motive power, the clockwork being fitted with a brake that is operated by an electro-magnet in the line, so as to check and release the power, and thereby cause the vibration of the tongue.

An improvement in wire lathing has been patented by Mr. William Brennan, of New York city. The object of this invention is to support wire lathing in ceilings in such a manner as to leave no air spaces between the beams and the mortar; such spaces, in case of fire, serve as draught flues, and thus cause the fire to spread rapidly, and increase the difficulty of controlling the fire.

Mr. Felice Tocci, of New York city, has patented a book case that can be folded and its depth greatly lessened, thus enabling it to be packed in a much smaller space than when it is in use. It may be carried through narrow spaces where an ordinary case will not pass.

Mr. William Wilmington, of Toledo, O., has patented a car wheel chill formed with a solid body portion, and having an annular chamber located in its flange face, inclosed by an inner wall, formed in one piece with the metal inclosing the other sides of the chamber, and same shape as the adjacent contour of the flange of the wheel.

Mr. Jacob F. Weitzel, of Galveston, Tex., has patented an improvement upon that form of vegetable grater or slicer in which a tapering bucket or receptacle is made largest at the top, and is combined with a concentric and cone-shaped grater or slicer whose bases rest close to the bottom edge of the bucket, and which cone-shaped grater or slicer is arranged to revolve and act upon the fruit or vegetables which wedge themselves by gravity down into the annular space. It consists in making the cone-shaped slicer or grater in oblate or elongated form in cross section, to improve the cutting action, and in combining the conical cutter and the reversely tapering bucket with a subjacent detachable pan carrying a spider frame with a socket to receive the end of the spindle of the cone-shaped cutter.

An improvement in car coupling has been patented by Mr. Charles H. Shippee, of Wickford, R. I. The object of the invention is to furnish automatic couplings of simple construction, having but few parts, strongly and durably fitted, and adapted for connection with the couplings now in use. The inventor makes use of a coupling and drawbar formed at its outer end with a swinging hook of peculiar construction, and fitted to slide endwise upon a block attached to the king bolt of the truck.

Mr. Carl J. Renz, of Hudson, N. Y., has invented an improved portable or pocket instrument or mould for use of travelers and others for making cigarettes neatly and expeditiously. It consists of a bed piece having a lengthwise groove and two compressing lids, which are hinged at the respective sides of said groove, and one of them provided with an extension consisting of a metal plate whose curve or conformation is similar to the groove in the bed piece, so that when the lids are closed the tobacco will be compressed in the paper envelope or wrapper.

An improved shoe-blacking machine, patented by Mr.