

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.

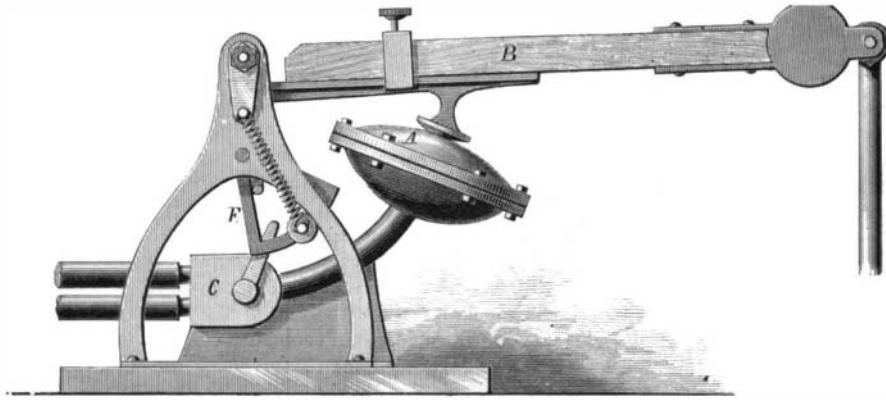


Fig. 1.—MAYHEW'S STEAM MOTOR.

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

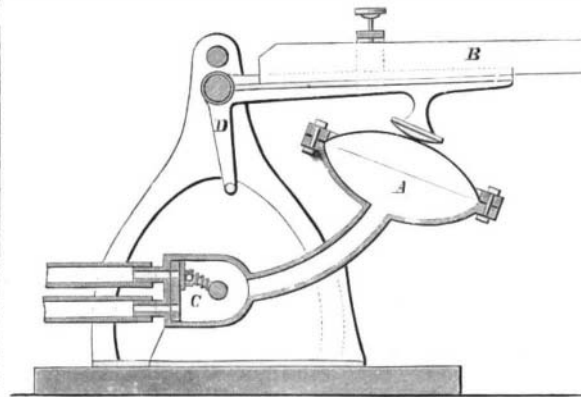
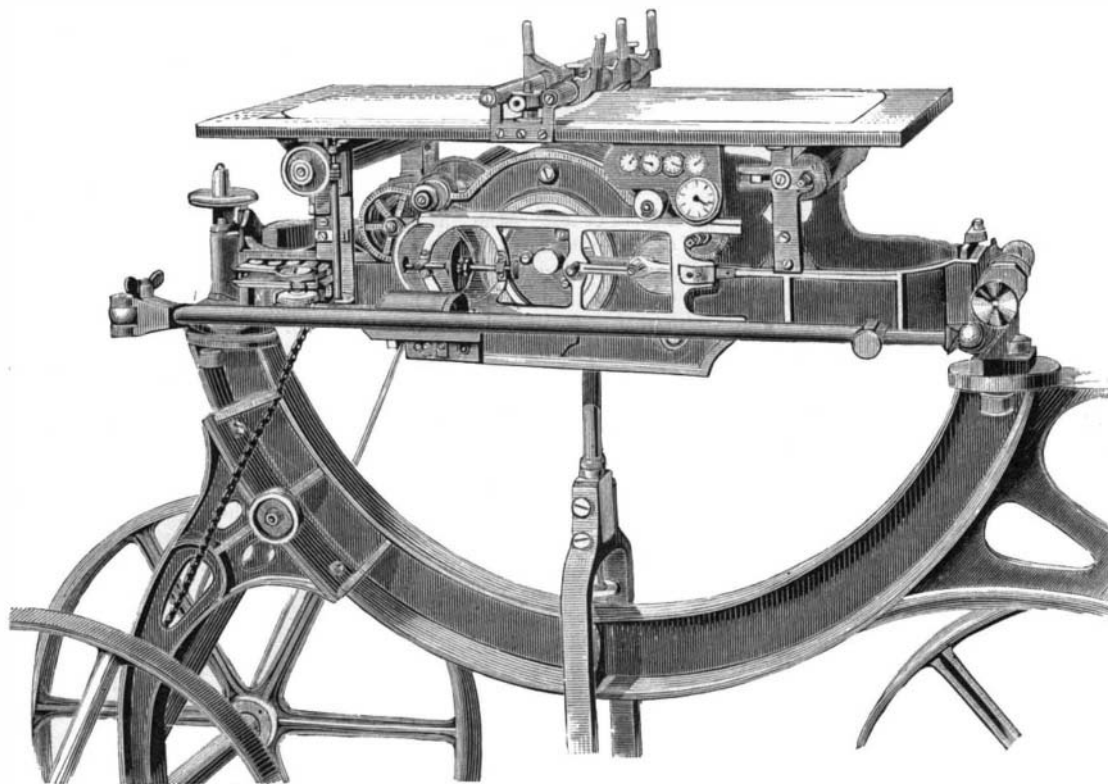


Fig. 2.—NOVEL STEAM MOTOR.

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.