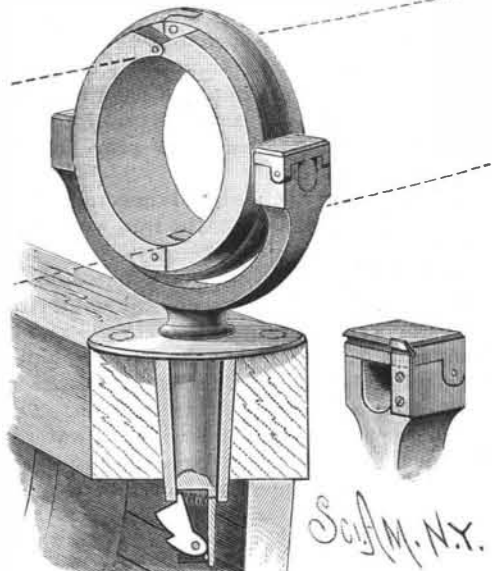


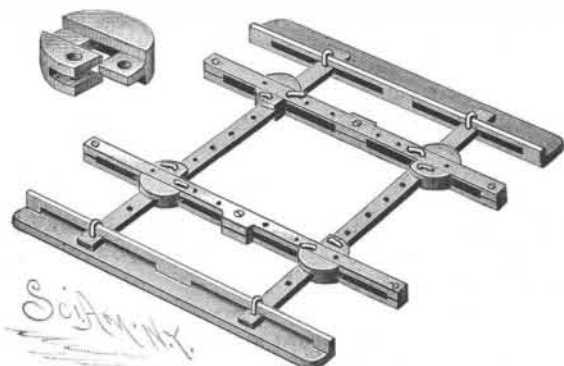
IMPROVED OAR LOCK.

In this oar lock simplicity and strength are combined with lightness, and there is perfect freedom in the handling of the oar, which will not unship in the roughest weather. Clamped around the oar is a hinged ring, the edges of which have outwardly projecting flanges. This ring is fitted to turn within another hinged ring having trunnions, by which it is mounted in the frame in the boat bracket. These two rings constitute a fixture upon the oar, and are made as light as possible, consistent with the wear and strain brought



TOMPKINS' IMPROVED OAR LOCK.

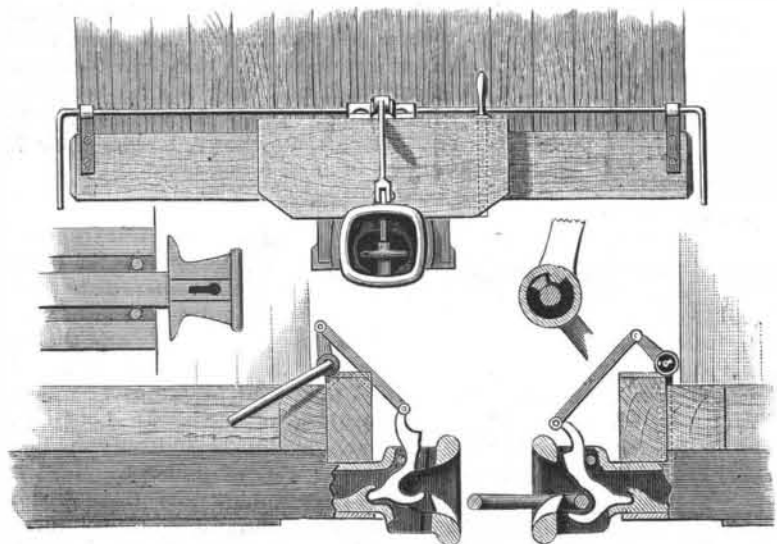
to bear upon them in rowing. The boat bracket is secured to the gunwale, and has a downwardly projecting tubular arm, in which the shank of a U-frame is held by a spring pin at its lower end. The bracket is not necessarily a portion of the oar lock, as the shank of the frame can be attached to various styles of boats in a multiplicity of ways. In the upper extremities of the frame are journals to receive the trunnions of the outer ring, one journal being positively inclosed at the top and provided with an inner vertical recess to facilitate the insertion of the trunnion, and the other being open and provided with a hinge cap, as shown in the



MEGORDEN'S IMPROVED PRINTER'S CHASE.

small view. A properly arranged spring holds the cap in its closed horizontal position. When it is desirable to receive the oar, the cap is thrown back against the pressure of the spring, or the spring is bent inward to release the cap. The oar can be readily and safely adjusted in the frame or removed therefrom. This oar lock relieves the strain of the oar upon the hand at the entrance of the oar, and to a great extent upon the stroke. It prevents the oar from slipping inboard and outboard, and permits the ready and very easy accomplishment of the movement necessary for feathering.

This invention has been patented by Mr. Alfred H. Tompkins, of 70 Hancock Street, Brooklyn, N. Y.



LALIME'S IMPROVED CAR COUPLING.

IMPROVED PRINTER'S CHASE.

The top and bottom pieces of the chase, for attachment to a job press, as usual, are provided with raised longitudinal strips formed with slots in which the ends of the side pieces are movably held by staples or clips. The end strips, between which and the side pieces the form is locked, are longitudinally slotted to receive the side pieces through them. Both side and end strips are formed with rows of holes to provide for their respective adjustments nearer to or farther from each other. The corner holders, the form of which is clearly shown in the upper left hand view, serve in connection with the pins passing through them and through the strips to lock the strips to their places when adjusted. These holders also serve to couple and guide and keep parallel with each other the side and end strips. The holders have slots through them to receive the side strips, and upper and lower transverse grooves to receive the slotted end strips, and have holes formed in them to receive the pins. One portion of each holder is cut away, so as not to protrude within the space in which the form is held. It is evident that when the pins are withdrawn, the side and end strips can be adjusted as required; in this way the chase, which is made of steel or iron, can be adjusted to lock up any size or shape of form, from a single line to a square or larger form.

This invention has been patented by Mr. Holiver Megorden, of Farmington, New Mexico.

IMPROVED CAR COUPLING.

The drawhead in this car coupler is formed with outwardly extending side ears, as shown in the left hand inverted plan view, the drawbar being connected with the car body and with its spring in the usual manner. The drawhead is also formed with a hooked prong extending upward and toward the rear from the bottom of the link recess, the outer face of the prong being convex, while its inner face is concave. Back of the link recess is a vertical recess, extending entirely through the drawhead, a forwardly extending horn being arranged at the rear of the recess. Within the recess is mounted a swinging hook shaped as clearly shown in the lower view, and which is connected, by a link, with a lever arm carried by a sleeve loosely mounted upon a crossbar supported by brackets secured to the end of the car. The bar is formed with a bit, and the sleeve has an inside flange or feather, as shown in the small view. Upon each end of the crossbar is a lever arm or handle.

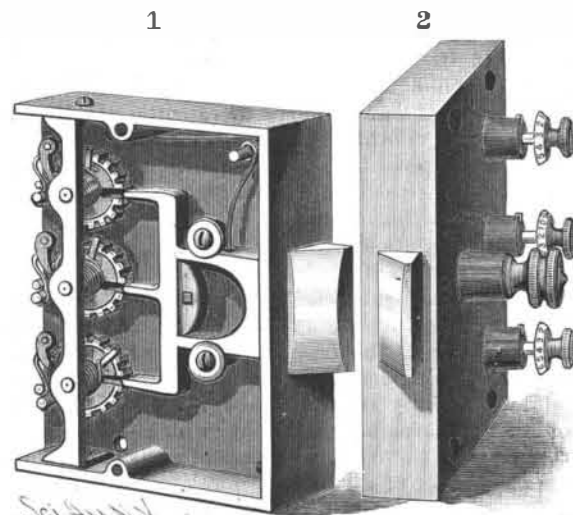
The operation of this coupler is as follows: A coupling link inserted in the drawhead recess rides up over the convex face of the hook or prong, behind which it drops above the lower point of the swinging hook, the parts then being about in the position shown in the lower right hand view. As the link enters the opposite drawhead, its forward end strikes against the hook and forces it to the position shown, and drops down behind the prong. The cars can be uncoupled by turning the lever arms to raise the hook, which will carry the link above the point of the prong and permit its withdrawal. The position of the link can be regulated by so turning the lever arms as to carry the hook downward, and thereby raise the projecting end of the link; by turning the arms in the reverse direction, the outer end of the link can be depressed. To lock the parts against automatic coupling, the hooks are held in an elevated position. The accidental removal of the hook is prevented by a pin passed through the drawhead behind the hook. Should the hook or any part of the operating mechanism break, the coupling may be brought about by means of an ordinary coupling pin, which is carried in a proper recess formed in the head block. As the cars provided with this coupler come together, any undue strain upon the drawbar spring is obviated by the peculiar form of the drawhead, the ears or shoulders of which abut against the buffer block, and thus relieve the spring from any undue strain.

This invention has been patented by Mr. Eusebe Lalime, of Malone, N. Y.

IMPROVED COMBINATION LOCK.

This combination lock is the invention of Mr. George R. Boyce, of Orange, N. J. It can be quickly set to any combination desired, is easily locked and unlocked, and is very simple in construction. In the casing slides a bolt normally held projected by a spring, and retracted when released by a permanent key with spindle and head. The bolt, in this case, is formed with three prongs and is locked, when projected, by its prongs striking the peripheries of three setting wheels. When retracted, the prongs enter deep radial slots in the wheels. The peripheries of the wheels are normally presented to the prongs to lock the bolt by coiled springs which act to turn the wheels, the position of the radial slots with respect to the prongs being determined by lugs projecting from

the wheels striking against stop pins. The wheels are turned forward against the tension of the springs to present their slots to the prongs by means of spindles passing through the front of the casing and having turning heads. The forward parts of the wheels are formed with ratchet teeth engaged by pawls pivoted to the casing, which prevent the teeth from being turned back by the springs. The amount which each wheel must be turned to bring it from its original position of rest into position to release its bolt prong can be determined by the audible click of the spring pawl, or an



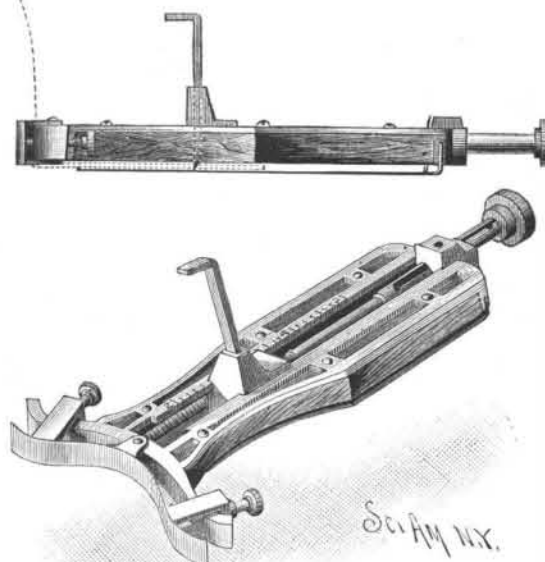
BOYCE'S IMPROVED COMBINATION LOCK.

ordinary index and numbered dial may be employed, if desired.

In order to again lock the bolt after being released, and return the wheels to their original locking position, the ratchets are movably arranged with respect to their pawls by mounting their spindles to slide lengthwise, whereby the wheels can be pushed forward to disengage their ratchets, when they will be immediately returned to their original position by the tension of the springs. On the spindles being released, the springs also serve to press back the wheels into engagement with their pawls. The positions of the stop pins can be varied to change the position of rest of each wheel and the degree of rotation necessary to present the releasing slot to the bolt prong. The stop lug on each wheel can also be independently adjusted. To further increase the difficulty of solving the combination, the spindle of each wheel is provided with a clutch collar held by a spring in engagement with a similar collar on the wheel. By drawing the spindle out slightly it is disconnected from the wheel, and can then be variously adjusted so as to prevent one's noting the motion of the setting wheel by the marks on the turning head or knob.

ROUNDING JACK FOR HAT BRIMS.

The metal frame is provided with a curved breast and formed with a central longitudinal passage



HILD'S ROUNDING JACK FOR HAT BRIMS.

or way for the knife stock. The frame is furnished with a wooden backing having a passage corresponding to that in the frame, but somewhat wider, so as to expose the edges of the frame, and thus form guides for the knife stock. The stock is formed with side grooves to receive the edges of the frame and with a vertical opening to receive the knife, and also with a screw-threaded opening to receive a rod, which acts as a set screw to the knife and as an adjusting rod for moving the stock in the groove to set the knife for cutting any desired width of brim. The rod slides freely in an opening in the frame, and is held in the desired position by a set screw. The upper surface of the frame is graduated to facilitate the accurate setting

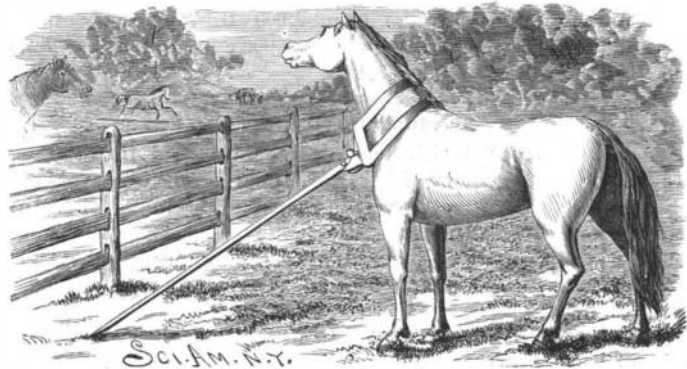
of the stock; and in order to remove the stock, the frame is formed with clearances in the edges at one end of the passage. Upon the wooden backing is detachably secured a guard plate for supporting the brim, shown by the dotted line in the upper view, being cut.

The curved breast is provided with a flexible guard, the ends of which are adjusted by screws threaded into the guard to form a curve of greater or less radius, according to the size of the hat crown. This guard is formed with a central lip held to the breast by a screw.

This invention has been patented by Mr. Michael Hild, of 321 Diamond Street, Philadelphia, Pa.

ANIMAL POKE.

This poke is so arranged that, while the animal is free to graze, it will be impossible for it to move forward while its head is erect. The straps encircling the neck of the animal are secured to two side blocks, between which is pivoted a forwardly and downwardly extending rod. In order that the rod may project forward at a proper angle, a limit pin is arranged in connection with it, so as to rest against forwardly extending arms



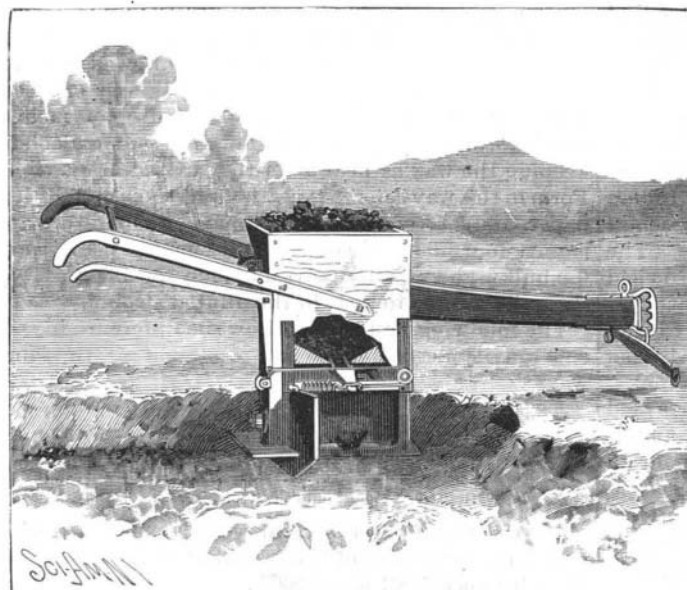
SCHWALM'S ANIMAL POKE.

made integral with the blocks. The forward end of the rod is pointed, the point being formed by beveling or rounding off the lower end from the rear side of the rod. When the device is arranged as shown in the engraving, the animal will be held against any forward movement while its head is erect, as the pointed end of the rod would enter the ground; but when grazing, the head is lowered, and the rod then assumes a more nearly horizontal position, thereby raising the point from the ground and allowing the beveled portion of the rod to slide along the ground. The animal can back and turn freely at all times, but cannot move forward nor jump fences.

This invention has been patented by Mr. Francis Schwalm, of Fort Smith, Arkansas.

COMBINED FERTILIZER DROPPER AND HILL FORMER FOR TOBACCO PLANTS.

The object of the invention herewith illustrated is to provide combined fertilizer droppers and hill formers



COGHILL & UNSELT'S COMBINED FERTILIZER DROPPER AND HILL FORMER FOR TOBACCO PLANTS.

for tobacco plants, constructed in such a way that the fertilizer can be dropped at the proper places, covered with soil to form a hill, and the soil packed to form places for the plants. To the rear end of the beam is attached a vertical standard, just forward of which is secured the end of an upright bar, upon the forward side of the lower end of which is formed a point to cause the end to enter the soil readily. To the rear side of the lower end of the bar is attached the forward end of a horizontal bar, whose rear end passes through a plate secured to the forward side of the standard, and has a nut screwed upon it. To the rear side of the lower part of the upright bar is bolted a plate smaller than the other, and to the lower end of the standard is attached a horizontal plate. To the beam and standard is secured a box or hopper to receive the fertilizer, which is guided to the center of the lower part of the hopper, where it rests upon the dropping plate. In the free end of the plate is formed an aperture to receive

the fertilizer and carry it to the discharge opening formed through the hopper bottom, so that no more of the fertilizer can escape through the opening than is carried to it by the aperture in the plate. To the free end of the plate is fastened a cord, which leads to an elbow lever placed so as to be conveniently grasped and operated by the hand to move the plate to drop the fertilizer. The plate is drawn back by a spring to again receive the fertilizer. In using the machine, the land is marked with cross marks, across which the machine is drawn at right angles. The plate carried by the upright bar brushes aside the lumps and crowds and pushes the soil before it, forming a small bank, while the rear plate pushes the soil before it at the same time and forms a larger bank. As each cross mark is reached, the lever is operated to drop the fertilizer, which is scattered by falling upon the horizontal bar, and at the same time the machine is raised, causing the front plate to pass over the soil pushed before it and causing the rear plate to carry forward the upper part of the soil pushed by it, cover the fertilizer, and form a hill to receive the tobacco plants. As this latter plate crosses the mark the machine is lowered, bringing the horizontal plate down upon the top of the hill, marking the hill and packing the soil so that it will not fall in and fill the hole formed by the peg before the plant has been inserted.

This invention has been patented by Messrs. John C. Coghill and Charles H. Unsell, of Woodville, Ky.

THE MOMENTUM OF LIQUIDS.

T. O'CONNOR SLOANE, PH.D.

A simple experiment, illustrative of the force of a jet of water, is illustrated in the cut accompanying this article. A capillary tube has a bulb blown upon it at about its center. If one end of this tube is immersed in water, and suction is applied to the other end by means of the mouth, the most natural thing to expect would be the filling of the bulb. But on trying the experiment it will be found that if any considerable degree of suction be employed, the bulb will fill very slowly and by a species of secondary action. The water will be drawn up toward the top of the tube, and will enter the bulb with considerable force, forming a little jet. This jet will enter the tube above the bulb, and will be drawn upward through it, leaving the bulb empty. A little air will be drawn up with the water, and a little of the fluid will fail to enter the upper tube. These two causes apparently, but strictly speaking only the first one, will gradually fill the bulb.

Instead of directly aspirating, the apparatus may better be arranged as shown in the cut. The exhaustion is produced within a bottle, and this receives the water delivered by the tube. The bottle is closed with a tightly fitting rubber cork, perforated for the passage of both tubes. Thus arranged, the experimenter can better observe the effects of the exhaustion. The appearance of the smooth, cylindrical thread of water as it crosses the bulb is quite interesting. In the bottle also a jet is produced, but, owing to the air carried up with the water composing it, this jet is not so smooth and regular as the lower one.

It will be noticed that the capillary tube is provided with a funnel at one end. This is for the purpose of reversing the experiment. The bottle is placed below, and the suction tube drawn up until its lower end is nearly even with the surface of the cork. Water may now be poured into the funnel, and suction may be applied. The water forms the thread, just as before. If the supply to the funnel is kept up, the bulb remains empty, or partially so, for some time.

Its action in gradually filling the bulb by producing exhaustion is due to the fact that the jet forms a *trompe*, or water air pump, similar to the Geissler mercury pump or the Bunsen water pump. Both of these are used for producing vacua on a similar principle, air being carried away by a moving column of water, with which it is mixed.

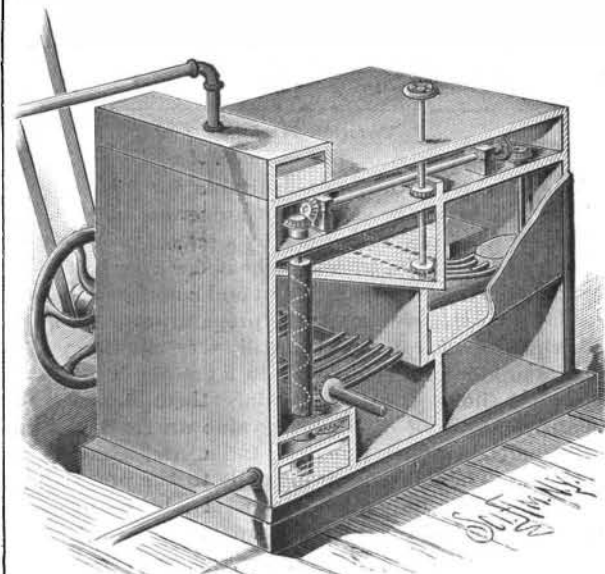
An Acid-proof Bronze.

Mr. P. Reitz has devised a bronze composition which is not attackable by acids and alkalis. This alloy is adapted for use in all those cases where recourse is had to ebonite, porcelain, and other materials, which, while proof against acids, are exposed to wear, and are for the most part very costly. The alloy consists of a mixture of copper, lead, zinc, and antimony, and consequently of materials already employed in the composition of bronzes; and so it is to the judicious proportions of the mixture that Mr. Reitz attributes the new results obtained. He melts in a crucible 15 parts of copper, 2 3/4 of zinc, 1 3/2 of lead, and 1 of antimony.

This alloy is worked as usual. It is adapted for use in the manufacture of chemical products, for washing apparatus and various utensils.—*Revue Industrielle.*

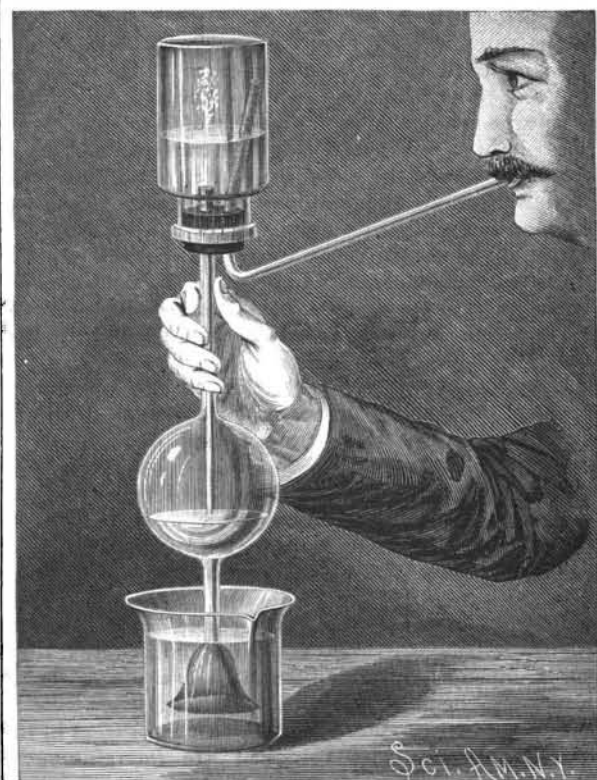
WATER MOTOR.

In this motor, which is the invention of Mr. Antoine Lucier, of Winnipeg, Manitoba, Canada, a portion of the water is used over and over, with some additions from time to time, the parts being so arranged that the power produced can be utilized in the running of machinery. The main inclosing case is formed with an upper tank having an inclined bottom, an oppositely arranged tank below the upper one, and also having an inclined bottom, and a third tank at the bottom; the latter tank having an outlet for the escape of a portion of its water, the rest being returned to the top



LUCIER'S WATER MOTOR.

tank. One or more vertical tubes extend from the lower to above the water level of the top tank, and in each tube is arranged an Archimedean screw. At the top of each screw shaft is a bevel gear, meshing with a similar gear on a horizontal shaft, upon the other end of which is another gear engaged by a gear carried by a vertical shaft driven by a water wheel contained in a case fed by tubes leading from the lower part of the upper tank. The central tank supplies water to other wheels arranged just above the bottom tank, these wheels being connected to drive a horizontal shaft, from which the power is obtained. Above the case is a supply tank, fed in any suitable manner. In operation, the water from the top tank will operate the wheels connected with it, and, through the gearing, will impart a rotary motion to the screws, which will raise a portion of the water from the bottom to the top tank. The water then flows from the middle tank to the other set of wheels, and drives the power shaft. The water then runs into the lower tank, from which a portion is



THE MOMENTUM OF LIQUIDS.

discharged. By means of gates, the supply of water passing from the upper to the middle tank, or from the middle to the lower tank, can be regulated.

In the *Boston Medical and Surgical Journal* of March 10, Dr. J. S. Howe calls attention to the poisonous effects of the common ox eye daisy (*Chrysanthemum leucanthemum*, L.) upon certain persons, chiefly those who suffer similarly from the poisonous effects of *Rhus toxicodendron*. The symptoms produced are those that are included in the description of dermatitis vinenata, and consist in troublesome heat and itching, and the formation of vesicles, followed by desquamation of the cuticle.