

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



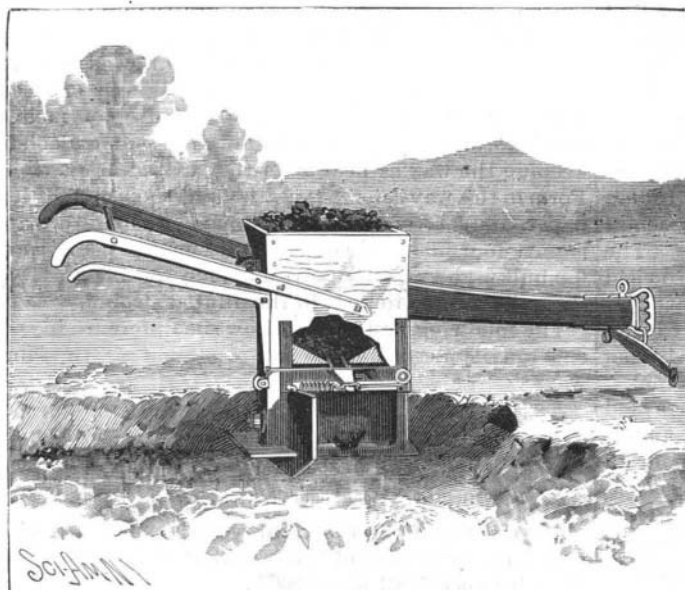
SCHWALM'S ANIMAL POKE.

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.

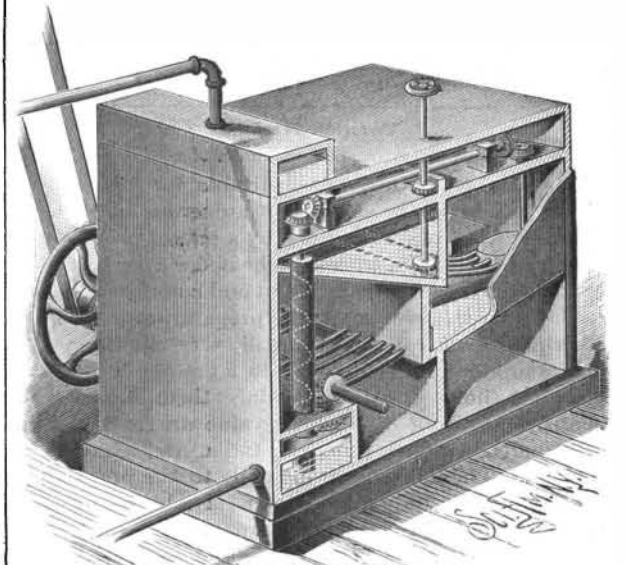
An Acid-proof Bronze.

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.*

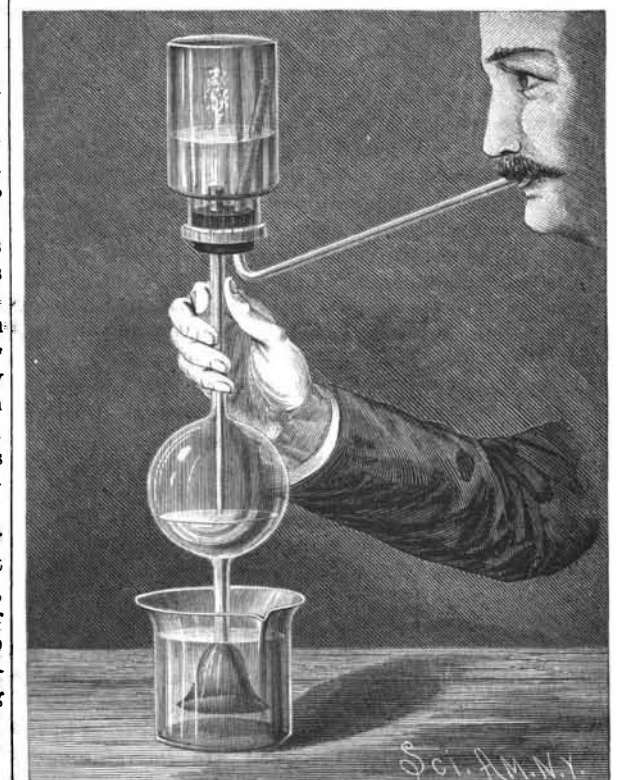
WATER MOTOR.

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.