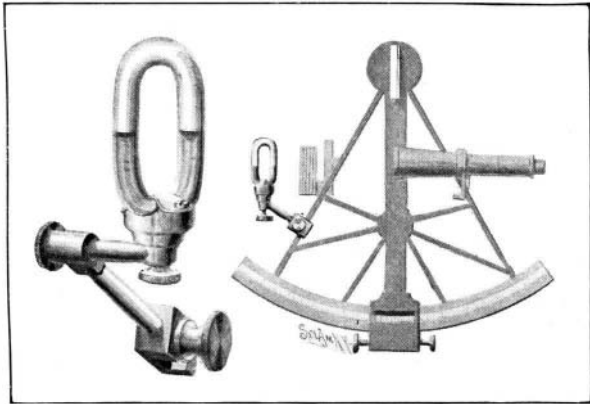


**ARTIFICIAL HORIZON.**

An improved artificial horizon, more especially designed for use on marine sextants, has recently been invented by Mr. Joseph T. Edwards, of New Bedford, Mass. The device has a very simple construction, and may be readily applied to enable the observer to quickly and accurately bring the eyepiece and horizon glass in proper horizontal position when making an observation. Our illustration shows the simple construction of the device. It consists of a glass tube bent to the form of a flattened ring or link, and partly filled with mercury or some other suitable liquid. This ring is vertically pivoted to an arm, which is horizontally pivoted to a bracket adapted to be clamped to the



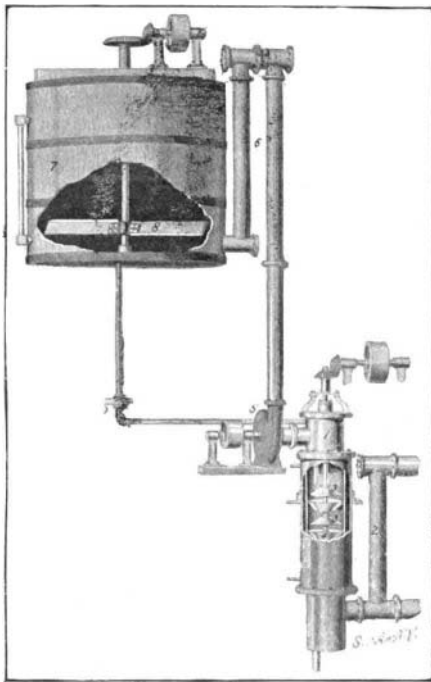
**ARTIFICIAL HORIZON FOR MARINE SEXTANTS.**

frame of the sextant. Provision is thus made for proper adjustment of the artificial horizon, to bring the level of the liquid into axial alignment with the horizon glass and the eyepiece. On sighting through the eyepiece the observer can easily determine whether the sextant frame is held in proper position; for when slightly tilted the surface of the liquid in one leg of the device will rise higher than that in the other leg, and not until a proper position is reached will they both perfectly coincide with the axial vision.

This device will be found particularly useful at night or on occasions when the natural horizon is blurred from the sight, or, if used on land, when the true horizon cannot be determined by reason of irregular topography. By making the artificial horizon in the form of an endless tube, no errors will result by reason of unequal air or vapor pressure in the two legs of the device.

**A NEW ACID CHAMBER FOR SULPHITE WORKS**

The acid chamber illustrated herewith—the invention of Mr. William A. McKee, of Hinckley, N. Y.—is designed to cause a thorough mixing of the lime water



**A NEW ACID CHAMBER FOR SULPHITE WORKS.**

and the sulphur dioxide gas in forming the bisulphite of lime liquors needed in the sulphite process of making pulp.

The mixing chamber consists of a water-jacketed cylinder, 1, containing conical hoppers, 4, hung from brackets on the interior wall of the cylinder, which is of thin sheet lead. Interspersed between these hoppers, but mounted on a revoluble central shaft, are

similar inverted cones, 3, adapted to act as splashers and to spread the lime-water as it trickles down and dash it, by centrifugal force, against the wall of the cylinder, whence it flows into the next hopper and from there on to the next cone, etc.

The gas is drawn in through pipe, 2, by means of the fan, 6, and it follows a sinuous course around the outer edges of one set of cones and through the center of the other set, thus coming into intimate contact with the lime-water, and being absorbed by it. Any gas that is not so absorbed passes through pipe, 6, and up through the tank, 7, filled with the liquid, where it is bound to be absorbed. The lime-water in the tank is constantly stirred by the paddles, 8, and its flow into the mixing chamber is regulated by valve, 9.

**SEED-CLEANER FOR GRAIN SEPARATORS.**

The seed-cleaner illustrated herewith is adapted to be used in connection with a threshing machine, to save the expense and labor of transporting with the wheat a lot of refuse which must subsequently be separated at a loss to the farmer. The improved cleaner may be readily adjusted to clean different kinds of seeds from grains, discharging the refuse into bags instead of permitting it to accumulate beneath the separator. The invention comprises a delivery spout, which is arranged to receive the grain from the elevator of the threshing-machine; this spout is so hung from the threshing-machine as to permit its being swung to any desired position. Within the spout is a series of screens which have meshes of different sizes. These screens are united together in a manner to produce a chute of square cross-section. This chute is of such size as to fit snugly into the spout. A hopper is provided at the upper end of the spout, and serves to direct the grain through a feed-tube, into the screen chute. A regulating gate is hung pivotally in the feed-tube. This gate may be operated by the sliding rod on the spout, to limit or cut off the flow of grain into the screen. The rod may be secured at any desired position. The grain is cleaned by flowing down over the lowermost screen. The refuse passes through the meshes of the screen, and is collected in a bag hung beneath the lower end of the spout, while the grain flows on through the chute into any suitable receptacle. By rotating the screen-chute, screens of different sizes may be brought into position as desired. For instance, one screen may permit grass-seed, mustard-seed, and buckwheat to pass through, while the wheat passes over the screen; the second screen may separate grass-seed and mustard-seed from flax; a third screen may separate fowl seed from barley and oats, and a fourth screen may permit wheat to drop through the meshes, while the wild-oat seeds pass over the screen. The inventor of this seed cleaner is Mr. Levi Thortvedt, of Glyndon, Clay County, Minn.

**MECHANICAL TOY.**

The meek little donkey and sturdy Shetland pony which give children such delight in our parks and recreation grounds, are now threatened with extinction by the advances of civilization, just as is their giant relative, the horse. A mechanical genius has invented an automatic pony which, when propelled by the rider, goes through all the motions of a trotting horse, even jolting the saddle up and down in perfect imitation of real life. The inventor of this device is Mr. Franz Hubsch, care of Joseph Hubsch, The Castle, Tarrytown-on-Hudson, N. Y.

The mechanical pony is mounted to travel upon a track consisting of two rails, one being arranged above the other, as shown in our illustrations. Two flanged wheels engage the upper rail, and a guide roller which travels on the lower rail prevents the machine from toppling over. The stirrups are connected to a pair of racks which mesh with the driving gear. The driving gears actuate the flanged wheels through ratchet devices which prevent backward movement. The parts are so connected that the downward motion of the stirrups causes the saddle to rise, then by jouncing the saddle down the stirrups are raised. Thus by alternately depressing the stirrups and the saddle the toy is, of course, propelled. The legs of the animal are hinged near the top, and connected at their upper ends to crank disks which are operated to give them the desired motions.

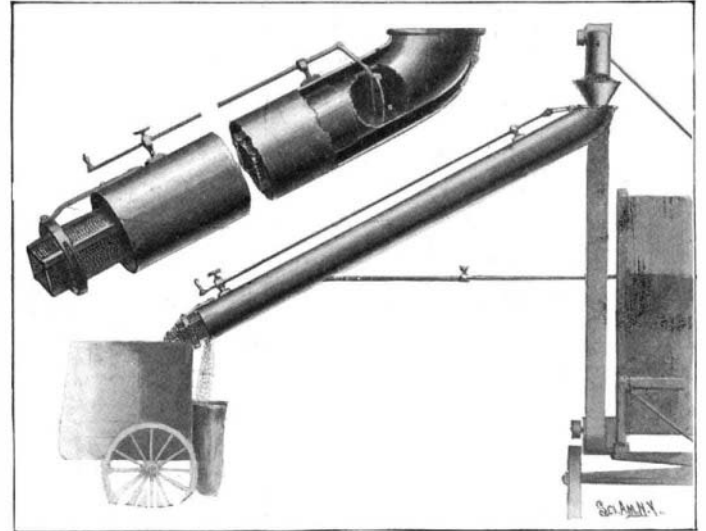
As a substitute for the real live animal this contrivance certainly affords a great many advantages. The anxious mother or the preoccupied nurse need have no

fear of accident. The mechanical beast is a model of patience and docility. It will neither bite nor kick, nor run away, no matter how cruelly it is beaten. The young rider needs only to push the pedals down, and away goes his fiery steed, jouncing him up and down in the most realistic manner. What more could the young sportsman desire?

**A Machine for Extracting Essence from Lemon Peels.**

News comes from Messina, Sicily, that an inventor of that city, Giovanni Serravalle, has patented a machine for extracting the essence of lemon peels.

The important part of this machine consists of two disks of about 4 1/8 inches diameter each, the surfaces of which are indented like a nutmeg grater, so as to hold the peel in place. The disks are placed opposite each other. In the first movement, they separate about 3 1/2 inches, and receive a half peel (previously deprived of the pulp) from a wheel, the spokes of which project about an inch above the rim, which



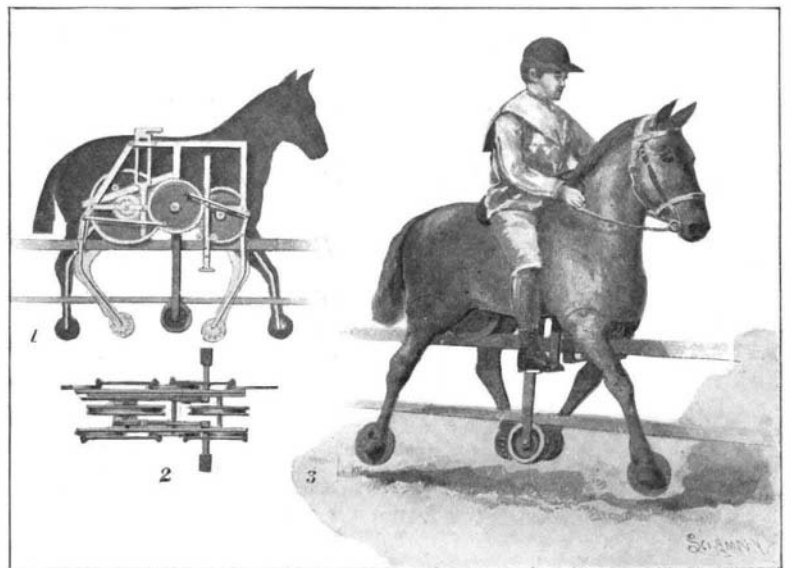
**SEED-CLEANER FOR GRAIN SEPARATORS.**

places the peel between the disks just before they meet. The disks revolve in opposite directions and squeeze the essence from the peel without breaking it. The peel is then ejected automatically and a fresh one is inserted. The essence as it is extracted is gathered in sponges placed under the disks. The disks can hardly be seen, being hidden by two cups, which prevent the escape and evaporation of the essence.

All the work is done automatically, except placing the peels on the spokes of the wheel which supplies the disks. This work, being very simple, is done by women and boys, who receive 80 centesimi (16 cents) for ten hours' work. The capacity of the machines is 16,000 half peels per day of ten hours.

**A New Utilization of Yeast.**

Mr. A. J. Oxford, of Walton-on-Trent, Derbyshire, England, is the inventor of a fodder obtained by heating yeast, to burst its cells and liberate their liquid albuminous contents, then separating the liquid constituents from the solid matter, and combining them, with or without concentration, with suitable meal. A top dressing or fertilizer may also be prepared from



**MECHANICAL TOY.**

yeast, which may have undergone decomposition before heating to burst the cells, the product being dried or mixed with some absorbent, as kiln dust or desiccated malt culms. In the case of undecomposed yeast, the liquid constituents may be used for the preparation of food, and the solid matter dried for use as a fertilizer. A fertilizer may be prepared directly from the yeast by mixing the latter with quicklime.