RECENTLY PATENTED INVENTIONS.

Of Interest to Farmers.

GATE AND DOOR FASTENER.—F. J. S. MIELY, Gunnison, Col. In this patent the purpose of the inventor is to provide a novel, simple device for securing a door, gate, or the like in closed condition, the fastener being durable, and convenient to operate. The fastener is very desirable for use in the closure of an opening in a fence through which cattle are driven from one inclosure to another.

Household Utilities.

CANDELABRUM.—O. H. VAN GUELPEN, New York, N. Y. The candelabrum is so constructed that its arms can be turned around a central support, and the arms are so jointed and connected that their members can be placed in any position in relation to each other, and fastened in adjusted position, the adjustment being done with ease at the back or front of the device.

ANTISEPTIC TOOTH-BRUSH HOLDER.—W. D. JONES, New York, N. Y. The holder is arranged to contain the brush in a tube filled with antiseptic vapors, to allow convenient removal of the brush for its legitimate use and replacing of the same in the tube, and to supply the latter continually with vapors to maintain the brush when not in use in an antiseptic condition.

Machines and Mechanical Devices.

MACHINE FOR SHEARING METAL SHEETS.—G. B. JOHNSON, 8 Victoria Street, Westminster, London, England. This machine facilitates and reduces manual labor incidental to the accurate shearing of sheets to a rectangular form, and is designed to overcome difficulties in such operations when performed by a single shearing cutter to which the edges of the sheet are successively presented, and more especially when it is required to simultaneously cut a number of roofing sheets in the "pack" as the latter is delivered from the rolling mill.

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A Free Opinion as to the probable patentability of an invention will be readily given to any inventor furnishing us with a model or sketch and a brief description of the device in question. All communications are strictly confidential. Our **Hand-Book** on Patents will be sent free on request.

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(Continued on page 477.)

(*Concluded from page 476.*)

by much splashing and turbulent vortical motion resulting apparently from the streams that converge from all sides of the axis of the air tube at its upper end, . . . but (when) the turbulence has cleared away from the upper part, and from this stage onward the jet is well seen in all the figures, and it persists long after the segmentation of the air column has taken place. The reader must not suppose that this jet is a mere falling of the water under the action of gravity, for the rapidity with which it advances is far greater than could be accounted for in this way. . . . The great initial momentum of the sphere causes it to continue in rapid motion after the bubble has closed, thus the sphere acts as a sort of piston, which by increasing the length of the air tube diminishes the pressure in it and so sucks in the bubble, which is driven down by the greater atmospheric pressure above. The converging horizontal inflow near the mouth of the air tube cannot, of course, produce the downward-directed jet without an equal and opposite generation of momentum upward; but this is now expended, not in producing a similar upward jet, but in balancing the excess of atmospheric pressure. The reaction, in fact, to the projection of the jet downward is the force which holds up and slowly raises the roof of the long air shaft." The rising of the roof is well shown in some of the accompanying photographs.

Thus, as Prof. Worthington points out, the formation of a downward jet is not, in a sense, a new phenomenon, but one which, having existed unnoticed before, is now rendered visible by reason of its being produced in air instead of water. An increase in the height of fall to 22½ feet was found to produce but little change in the phenomena coincident to the resulting splash.

As an illustration of the possible application of knowledge gained from a study of splashes in an unexpected quarter, Prof. Worthington draws attention to the fact that photographs of the splash of a projectile on striking the steel armor plate of a battleship bear a close resemblance to photographs of splashes caused by a sphere falling into liquid. There is the same slight upheaval of the neighboring surface, the same crater, with the same curled lip, leading to the inference that under the immense and suddenly applied pressure the steel has behaved like a liquid. The professor suggests that from a study of the motions set up in a liquid in an analogous case, it may be possible to deduce information about the distribution of internal stress, which may apply also to a solid, and thus lead to improvements in the construction of a plate that is intended to resist penetration.

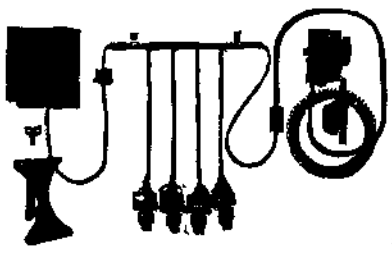
In conclusion it should be said that the number printed below each photograph here reproduced gives the time in decimal parts of a second which has elapsed since the first instant of contact.

CARNIVOROUS PLANTS OF THE FUTURE.

(*Continued from page 469.*)

edge of the leaf in certain species is seen to curl slowly inward. Now we can imagine that in the very far-away future with which we are dealing the Pinguicula will develop leaves which will hardly be less than five or six feet in length. These lying along the surface of the ground will make a special appeal to grazing animals. Perhaps as with the sundew the allurement will be in the form of some pleasant-tasting secretion which is peculiarly attractive to sheep and goats. We can imagine how these animals on first coming across the plants would start to regale themselves at the prepared feast. The strong sticky substances would take a firm hold of the hairs surrounding the mouth parts of the creatures, and in their endeavor to free themselves the animals would become more entangled. Gradually, too, the sides

(*Continued on page 478.*)



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MUNN & CO., Inc., 361 Broadway, New York

(*Continued from page 477.*)

of the huge leaves would close inward, and the fate of the victim could not long be delayed. A pitiable spectacle indeed to see these animals done to death by a plant, but the same process on a smaller scale is repeated thousands of times during the summer in any place where the Pinguiculas abound.

We can hardly think in this advance of vegetable life that the many species of pitcher plants which catch their prey more by allurement than by force, would be behindhand in the forward movement. Even at the present time many of these species develop processes which are several feet in length, as exemplified in the case of the Sarracenias and Darlingtonias. In one of the accompanying illustrations is pictured one of the colossal pitchers which in the course of ages may be evolved from the comparatively small Cephalotus—a native of Australia. There is no knowing what inducements these plants might not be able to hold out for the capturing of even man himself. Perhaps the tissue inside the pitcher would be peculiarly succulent, and we know that where there is anything worth having, there will always be found men daring enough to take the risk of getting it. Once inside the pitcher of the Cephalotus, escape would be possible only with a friendly assistant at hand. From the bottom of the pitcher three barriers would confront the prisoner anxious to get out. First of all there is a circular ridge projecting in such a way that it is most difficult to surmount. Secondly a stretch of wall thickly covered with processes resembling the teeth of a comb and all pointing downward. Last of all, on the involute rim round the mouth of the pitcher is arranged a fringe of decurved spines which resemble a row of formidable bayonets. Indeed, it would be a far more simple matter to get out of the average well than to make one's escape from a giant Cephalotus pitcher.

Although the matter does not involve death, the giant Aristolochia flower brings about the imprisonment of flies for quite a long time. The system is in connection with the cross-fertilization of the blossom. The insects are induced to enter the cavernous mouth of the great bloom by an odor strongly suggestive of carrion, which is peculiarly attractive to flies. Once inside, the flies are held captive by an ingenious arrangement whereby they are lost in the tortuous passages at the rear of the flower. After blundering around for some time the winged creatures are able to emerge again, not, however, before they have become well dusted with pollen for transmission to another bloom. It is possible that the Aristolochia of years to come will assume much larger proportions, and we may imagine that the flower will be able to hold out some allurement which will tempt large animals to enter its gloomy depths. It is more likely that escape from the colossal blossom would not be such a simple matter, and there might be a danger of a creature's coming unpleasantly near to starvation before seeing daylight again.

Far more dreadful than any of the plants described above would be the Venus fly trap of the future. This plant would be a vegetable terror. As is well known, the leaves of this plant are designed in the form of a trap. On the upper surface of each half of the leaf are three hairs. To touch any of them is to cause the organ to shut up, inclosing the object which has given rise to the irritation. The bordering of the leaf is formed of sharp fringed hairs which when the trap is closed prevent escape. At the most the leaves of the Dionæa are not more than an inch in length, but we may get a little idea of what this plant may be in years to come if we imagine the foliage to be large enough to grapple with a man. It is the habit of this plant to grow with its leaves half concealed beneath the sphagnum moss in which it thrives. The leaves of the giant man trap partly hidden by the undergrowth would form the

(*Concluded on page 479.*)

PENNSYLVANIA R. R.

Reminder Bulletin

There are two trains that the world is watching. They are making records, and records on land and sea and in the air are watched these days. The

PENNSYLVANIA SPECIAL

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Valve, dry, F. A. Phelps..... 942,100
Valve for engines, O. Pearson..... 942,587

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(*Concluded from page 478.*)

most terrible pitfall that the world has ever seen. Any unfortunate man who should chance to stumble into one of these leaves would be speedily crushed to death by the steady pressure of the inclosing sides. One can imagine that a country in which the man trap abounded would be avoided as much as a district inhabited by man-eating savages.

The aquatic plants such as the bladderworts (Utricularia) would scarcely be behindhand in this forward movement among the carnivorous species. These plants capture small water creatures by means of little bladders which are attached to their stems. The entrance to these receptacles is guarded by a little door, which can be opened easily from the exterior but may not be pushed aside from the interior. At the present time the bladders of the Utricularia are small, but there is no reason to suppose that they will always remain so. It is quite likely that they may increase in size so that they are able to grapple with good-sized fish and other water animals.

In these far-away days of which we have been speculating, plants will be divided into wild and tame sorts in the very real sense of the words. The botanical gardens of the time will be far more exciting than are the zoological collections of to-day. It is fortunate that all natural changes come about with great slowness, and it may be that the condition of man himself will have changed considerably by the time he is called upon to face these aggressive plants. It is to be hoped that this may be so, otherwise the outlook for the human race is distinctly disquieting.

A New Substitute for Cotton.

(*Concluded from page 470.*)

German East Africa, and the exports thence to Germany are steadily increasing. So far, little attention has been given to cocoanut fiber and the fiber of the many palms growing in the protectorates has been allowed to run to waste. With a view to becoming independent of foreign countries for her supplies of this fiber, Germany is also going to see what can be done with the product of her own colonies. The whole aim of the German is to become "independent" and, as far as possible, do without foreign goods and foreign labor. Other instances could be given of this, were they not quite outside the scope of the present article.

POWER-DRIVEN SCOOTER.

(*Concluded from page 472.*)

wheel clear of the ice when the engine is being started. This is accomplished by a lever of ⅜ x 1-inch iron placed and bent as shown in Fig. 1. When starting the motor the lever is pulled back and a small wedge of wood is slipped between it and the engine bed. After the motor has got going nicely it is slowed down and the lever gently relaxed, allowing the teeth to take a slight hold. As the craft gathers headway increase the power and also the pressure on the spikes until the lever is slack and the motor running at its maximum power. To stop, slow down and raise the wheel off the ice.

The construction of the rudder is simple. The stock is of ¾-inch iron 12 inches long. An 18-inch tiller of forged iron is pinned to the post with a ¼-inch pin. The stock is recessed and pinned to the iron yoke which carries the runner. This yoke is forged out of 1¼-inch iron and has a collar slipped over its shoulder to wear against another collar or flange fastened to the bottom to act as a bearing. A ½-inch pin secures the yoke to the runner. The runner blade is of ⅞-inch oak 1 foot 7 inches long and 2¼ inches high.

For the shoe use a piece of soft iron ¾ inch deep and ⅞ inch wide cut to a V edge at an angle of 45 degrees on each side. The shoe should have a rocker of about ⅛ inch for the 13½ inches it is supposed to bear on the ice. It should have 8 inches bearing forward of the rudder pin and 5½ aft. The shoe is held to the runner by three ⅜ through bolts riveted and smoothed off. A guard is placed under the boat to prevent the runner from catching in obstructions.

The engine can now be installed. For a foundation use two 1¼-inch oak stringers running along four frames and shaped and spaced as per requirements of engine used. The stringers should be through bolted from the outside of planking to top of the bed and drawn up tight and solid.

Now set the motor in its bed and fasten down with ½-inch lag screws 3 inches long. The exhaust is piped over the side and the water and gasoline tanks are situated on the forward deck. They each hold 3 gallons, and should be made out of 18-ounce copper. The piping is led down through the mast hole along the floor to the motor. It should be of copper tubing, ¾ inch for the gasoline and 1⅝ inch for the water.

The batteries and coil are placed just under the tanks. Six dry cells are sufficient. In order to have the scooter trim with one person on the seat it will be necessary to put about 60 pounds of lead up forward as shown. As the keels of these boats are rockered, attention must be paid to this or else the pressure on the rudder will be too great or it will be lifted clear.

A ½-inch heavy motor cycle roller chain should stand the strain with care; but as to the diameter of sprockets experiments would have to determine this, as it would vary for every type of motor. With the driving wheel turning up 700 revolutions per minute the scooter would be going about 33 miles per hour. If the motor could turn up to that or over, it would be better to let it run up and gear it down.

With a motor of six or seven horsepower and turning 700 to 800 per minute I would use for a starter an 8-inch sprocket on the driver and a 7-inch one on the engine.

(*Concluded from page 478.*)

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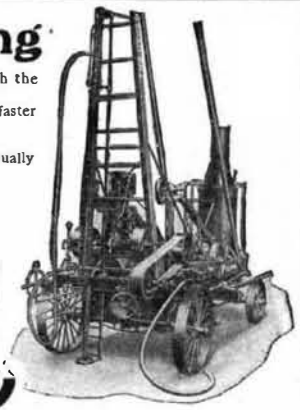

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