

IMPROVED HORSE HAY RAKE.

The invention herewith illustrated consists of a simple and novel apparatus for operating horse hay rakes, by means of which, it is claimed, both the rake and the clearer are more securely and readily adjusted, and at the same time more easily worked by the driver.

The thills are hinged to the axle, so that the latter, when released from the mechanism below described, is turned in its wheels by the pulling of the horse, the effect of such turning being to raise the rake. During the gathering, however, this revolution is prevented by the rod, A, which is bifurcated at its rear end and provided with several holes, so that it can be adjusted to the axle so as to permit the latter to turn rearward more or less, thus throwing the rake nearer to or farther from the ground, as desired. The forward end of rod, A, is pivoted to the hand lever, B, which lever is pivoted in the frame, C. On said frame, but not shown, is a downward-pointing hook, which receives the rod, A, just behind the lever end, which abuts against the hook, thus holding said rod firmly in the position represented in the engraving, and keeping the rake to its work until the rod is released by the driver by a suitable movement of the lever. The rake clearer, D, is connected by a forked rod to the lever, and pivoted above the fulcrum of the latter, so that, whenever the lever is actuated for raising the rake, the forked rod will also be moved, and thus the clearer caused to do its work quickly and efficiently.

Patented through the Scientific American Patent Agency March 9, 1875. For further information address the inventor, Mr. Benjamin Mellinger, Mount Pleasant, Westmoreland county, Pa.

IMPROVED NAPPER AND BRUSHER.

The machine herewith illustrated has been especially designed to meet the requirements of manufacturers of hosiery goods. It takes in any width of cloth, from 24 inches down, brushes the cloth in a flattened web, works on both sides at once, cleans off the specks, burrs, seeds, etc., raises a nap, restores the pliancy and softness (of which the washing has deprived the goods), and leaves the web in a smooth roll, ready for the cutter. To those who wash and dry in the garment—in which case the brushing is done immediately after the cutting—these capabilities of the machine will render it of especial utility.

The brush is arranged to do its work thoroughly, and in order to do this the goods are smoothly and gently stretched, both in length and width, over a roller having a firm and true surface, such surface being so made as to hold the goods in this smooth, stretched shape. To accomplish this, rollers about 5½ inches in diameter, made of cast iron pipe, are used; the shaft runs clear through, and the heads are shrunk in; the surface is then turned off true, and, with a tool made like a comb, having V-shaped points, the roll is filled with parallel grooves; it is then grooved lengthwise with the same tool. This gives a surface similar to emery, but differing from it in being true, with no chance to come off; it is then given a thin coat of paint to prevent rusting.

For the brush card, clothing is generally used, and the brush rollers are made of wood, so that the clothing can be easily tacked on. Its bearings are attached to long swing arms, which are held in place by spiral springs and adjusted by thumb screws and check nuts, so that the brush can be set parallel with the iron roller, and as close or far from the cloth as required. Its shaft and bearings are so made as to enable the user to turn it end for end in a few moments, the object being to keep the brush wire in working shape.

When a quarter or a seam, caused by basting on the end of another roll, reaches the brush, it should be raised for a moment to prevent injury to it. For this purpose, a handle on the left hand side of the machine is so connected as to raise both brush rollers at once. In case the cloth is brushed just as it comes from the knitting machine, the roll is placed in the bearings direct. The receiving pulleys are 5 inches in diameter, 3¼ inches face, calculated to run about 240 revolutions, the top to turn from the machine, thus giving 800 revolutions to the brushes. As the large pulley that gives motion to the brushes is double-crowned, they can be driven with one open belt passing around all three pulleys, or by two separate belts, open or crossed as the user prefers.

For the take-up, change gears are sent, so that the user can hurry or retard the cloth, as circumstances require.

The spreaders are made with long dowel pins, and can be lengthened by slipping on to said pins anything to fill the space and keep them extended, so that a few spreaders will meet the needs of most mills.

The amount of work that can be passed through the machine and the durability of the brushes depend upon how thoroughly one wishes to brush. One party in Troy, we are informed, is using one brusher for eight sets of cards, using

instead of supporting, the unfortunates who had trusted to them, by dropping down towards their hips. In this way scores of dead bodies were picked up in the water, wearing belts which, if properly constructed, would have saved the life of the wearer.

Printing Telegraph Instruments Duplexed.

Another important step has been successfully taken in duplex telegraphy. The combination printing telegraph instruments, used to a limited extent by the Western Union Company, have been successfully adapted to duplex operation. Two of these instruments, specially arranged for working on the duplex system by Mr. G. M. Phelps, are now in operation, sending and receiving simultaneously on one wire, and the speed at which they are worked is represented as something remarkable. Mr. Gerrett Smith has been engaged for some time past in making the necessary arrangements of circuits, etc., to accomplish this, and it is a complete success. The ease and rapidity with which these new instruments work, and the advantages which they possess, will be likely to lead to a more extensive use of them by the Western Union Company. No doubt they can be adapted to quadruplex operation also; and with four improved combination printers working on one wire, the amount of business which can be transmitted will be likely to astonish not only outsiders, but a large proportion of even experienced telegraphers.

It would be another instance of the changes which time

brings about, if the printers, with their old time recommendation, "prompt, accurate, and reliable," should once more become leading and favorite instruments for commercial telegraphic purposes.—*The Telegrapher.*

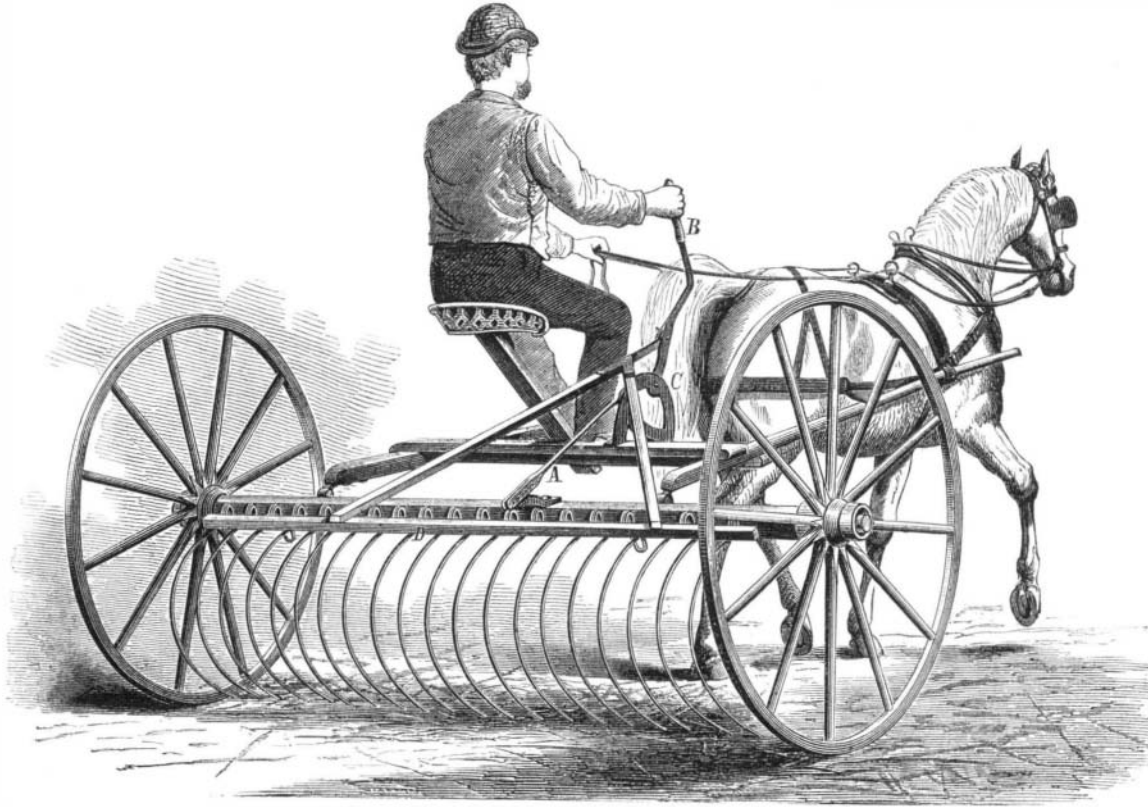
To Prevent White Paint from Turning Yellow.

Dr. Luedersdorff, of Berlin, in discussing the cause of white paint turning yellow wherever it is excluded from the light, attributes this fault to an inseparable property of linseed oil, and believes that the only cure for it is to substitute some other material for the oil. The value of drying oils for mixing with pigments depends entirely on the property which they have of being converted, by the absorption of oxygen, into a peculiar resin. When entirely dry, this resin is the only bond of union, and to it the oil colors owe their stability. During this oxidation of the oil to a resin and the drying of the paint, especially where there is insufficient air and light, the yellowing takes place.

The author believes that if, instead of waiting for the oil to be gradually converted into a resin, an already formed and colorless resin were employed as binding material, the paint could not change in color. Out of the long list of resins to be chosen from, Luedersdorff selects two, one of which is soluble in alcohol, the other in turpentine; the former is gum sandarac, the latter gum dammar.

When sandarac is employed, it is first carefully picked over, and all pieces of bark or wood thrown out; 7 ozs. of sandarac, 2 ozs. Venice turpentine, and 24 ozs. of alcohol of 90 per cent Tralles, or specific gravity 0.833, are put in a suitable vessel over a slow fire or spirit lamp, and heated with diligent stirring until it is almost but not quite boiling. If the mixture be kept at this temperature, with frequent stirring, for an hour, the resin will all be dissolved, and the varnish is ready for use as soon as it is cool. The Venice turpentine is necessary to prevent too rapid drying, and more dilute alcohol cannot be employed because sandarac does not dissolve easily in weaker alcohol, and furthermore, the alcohol, by evaporation, would soon become so weak that the resin would be precipitated as a powder. When this is to be mixed with white lead, the latter must first be finely ground in water and dried again. It is then rubbed with a little turpentine on a slab, no more turpentine being taken than is absolutely necessary to enable it to be worked with the muller. One pound of the white lead is then mixed with exactly half a pound of varnish and stirred up for use. It must be applied rapidly because it dries so quickly. If, when dry, the color is wanting in luster, it indicates the use of too much varnish. In such cases the article painted should be rubbed, when perfectly dry, with a woolen cloth to give it a gloss.

Dammar varnish is made by heating 8 oz. gum dammar in 16 oz. oil of turpentine to 60° or 70° R. (167° to 190° Fah.), stirring diligently and keeping it at this temperature until all

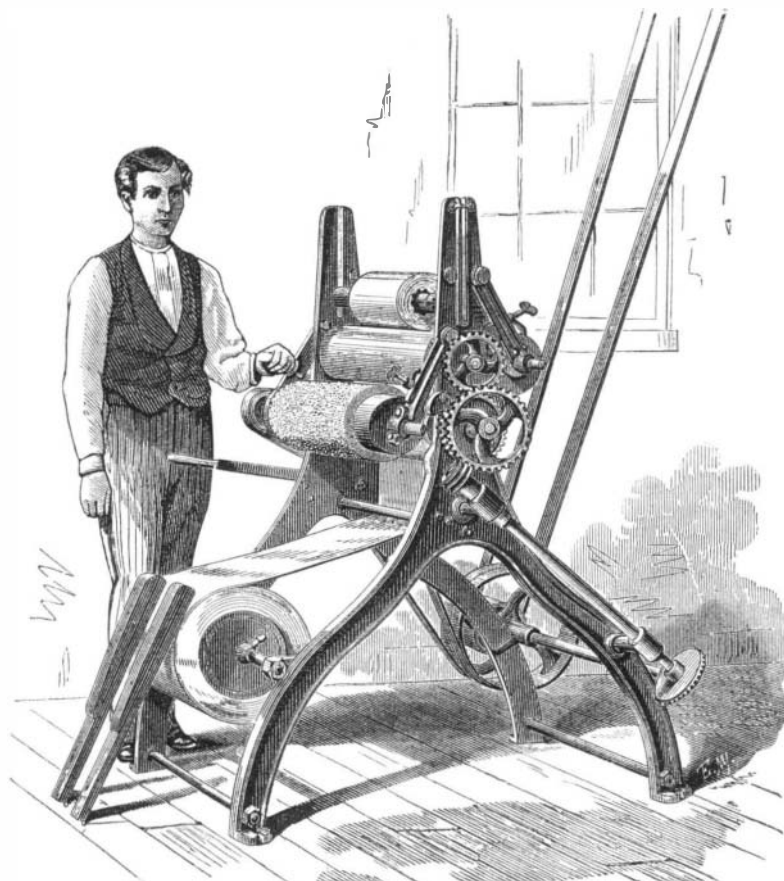
**MELLINGER'S HORSE HAY RAKE.**

old fancy for the brushes. Another party, who has just started one, has new clothing made on purpose for it, and is brushing for eleven sets.

Further particulars may be obtained from the manufacturer, Mr. C. Tompkins, Troy, N. Y.

Death Belts.

Frequently in cases of shipwreck, especially in comparatively smooth water, life belts would furnish a means of temporary safety until boats were got ready on shore. They would have done so in the case of the Northfleet, and in the still more recent instance of the Schiller. But the life belts must be genuine, and not pretexts for the purpose of figur-

**TOMPKINS' NAPPER AND BRUSHER.**

ing in advertisements as proofs of the care taken by the owners for the lives of their passengers. Those found upon the Schiller's victims appear to have been of the latter sort, consisting, as they did, of a few slabs of cork fastened together and to the person by one or two pieces of tape, and were thus worse than useless to a good swimmer; for it is stated that those who recovered the bodies declare that in very many instances they were found with the head under water and the heels in the air, showing that the belts had really drowned,

is dissolved, which requires about an hour. The varnish is decanted from any impurities and preserved for use. The second coat of paint, when dry, is dead white, and does not take a gloss so easily as the alcoholic paint. To give it a luster, a coat of the pure varnish, to which half its weight of oil of turpentine has been added, may be applied. It is still better to apply a coat of sandarac varnish made without alcohol, because dammar varnish alone does not possess the hardness of sandarac, and, when the article covered with it is handled much, does not last so long.

These paints are, of course, inferior in elasticity to freshly applied oil paint; but for window frames and closet doors, which do not require much bending, this is a quality easily dispensed with.

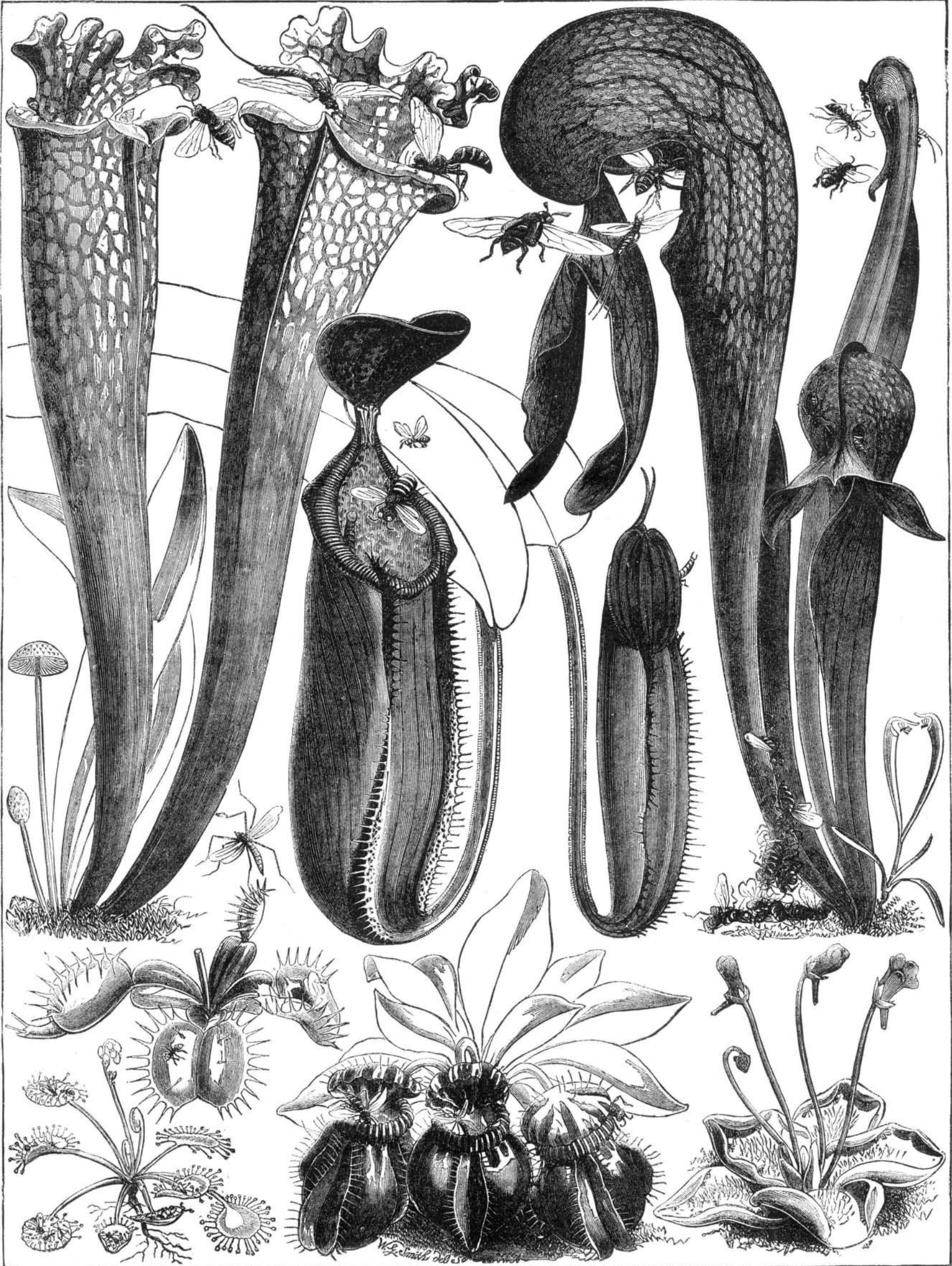
THE ANIMALISM OF PLANTS.

A century ago, Dr. Erasmus Darwin, grandfather of our

contemporary scientist who wrote the "Origin of Species," published a book entitled "The Botanic Garden": the second part of which bore the name of "The Loves of the Plants," and was much laughed at for its strange theories and the fantastic manner in which consciousness and volition were attributed to specimens of the vegetable kingdom. It was reserved for our day to show, beyond question or cavil, that paralysis of a plant can be produced by external injury, and that the existence of a nervous system in a vegetable cannot be denied; that flowers display their gorgeous hues to attract the insects which convey the impregnating pollen gathered from specimens of the other sex of the same plant; that flowers can not only digest and assimilate animal matter, but can crush insects and drop them on the soil for purposes of fertilization.

We publish herewith engravings of some carnivorous plants, which were described by Dr. Hooker, the cele-

brated botanist who has charge of the Royal Botanical Gardens, at Kew, Eng., in an address before the British Association, at its recent meeting at Belfast. Dr. Hooker and Mr. Darwin examined them very closely, and found that, when a fly was caught, it was dissolved in a digestive fluid exactly like ordinary gastric juice, and the same happened with a piece of beef; but when a mineral substance was placed on the leaf, there was no contraction. The fine hair on the leaf closed gently on a piece of wet chalk, but soon opened again, and rejected it. The experiments also proved that the contraction of the leaf was precisely similar to the contraction of a muscle, so that, as Dr. Hooker explained, it is not only proved that the digestion of the plant is like that of animals, but that it has a nervous system, and in fact forms one more link in the continuity of Nature. As our readers will see by reference to the engraving, these plants are furnished with various kinds of traps or snares for the unwary insects upon



CARNIVOROUS PLANTS.