

**MUNTZ'S TANNIN-TESTING APPARATUS.**

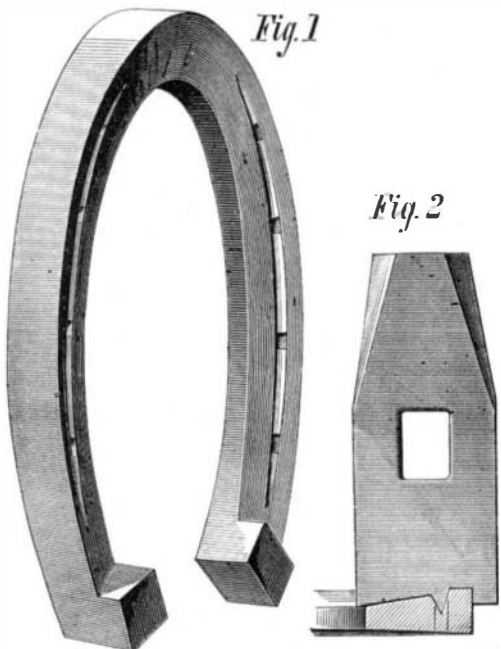
The accompanying engravings, which we extract from *The Engineer*, represent a new and simple apparatus for testing the efficiency of any tanning solution or material. The principle involved consists in forcing a solution containing tannin through a piece of hide. The density of the solution is taken before and after the operation, and a comparison of the densities enables the value of the solution to be readily determined.

Fig. 1 is a perspective view, and Fig. 2 is a section showing the internal arrangement. Having taken a small piece of raw hide, and placed it inside, on the base of the apparatus, the india rubber cover is closed down over it, and secured by the screws in the claws. The liquid to be tested is then poured in on the top of the piece of hide through the small opening, which is fitted with a screw stopper, B. This done, pressure is brought to bear by turning the perpendicular main screw, V, at the bottom of which is attached a brass disk, which gradually compresses the india rubber cover, and forces the liquid to filter through the hide. The screw must be tightened up occasionally so as to maintain the pressure. A glass is placed beneath the machine to receive the liquid, which percolates drop by drop. When sufficient has been obtained to fill a small test glass, the density is taken. To do this the glass should be filled with the first liquid kept in reserve, and the tannometer inserted. In a few minutes it will become steady, and the degree is then noted. The same process must be repeated with the filtered liquid. The difference of degrees between the two densities shows the percentage of tannin in the analyzed substance. This difference is multiplied by 40 if 2½ per cent of stuff is put into water; by 20, if 5 per cent; by 10, if 10 per cent; and by 5, if 20 per cent. For instance, if the tannometer marks for the first liquid 2.8, and for the second 1.3, the difference, 1.5, or 1½ degrees, must be multiplied by 40 if we have taken 2½ per cent, which gives 60 per cent of tannin; by 20 if we have taken 5 per cent, which gives 30 per cent of tannin; by 10 if we have taken 10 per cent, which gives 15 per cent of tannin.

The tannometer referred to is practically a hydrometer, which is supplied with the instrument. With it were detected the valuable properties of *balsamo carpon*, which, when gathered ripe and the gum taken off free from the fiber of the pod, contains 80 per cent of tannic acid. It is this gum which weights the leather. Gallnuts are liked by the tanners, but it is now found that the property of gallic acid is to open the pores and allow the other weighting materials to enter the hide. With this small machine, tanners and chemists can test the bark from different trees, some of which are known to yield tannic acid, and are employed for the manufacture of ink and dye, but have never been used for tanning leather. The hide takes from the solution all the properties it requires when the substance is filtered.

**STEPHENSON'S HORSESHOE AND SWAGE.**

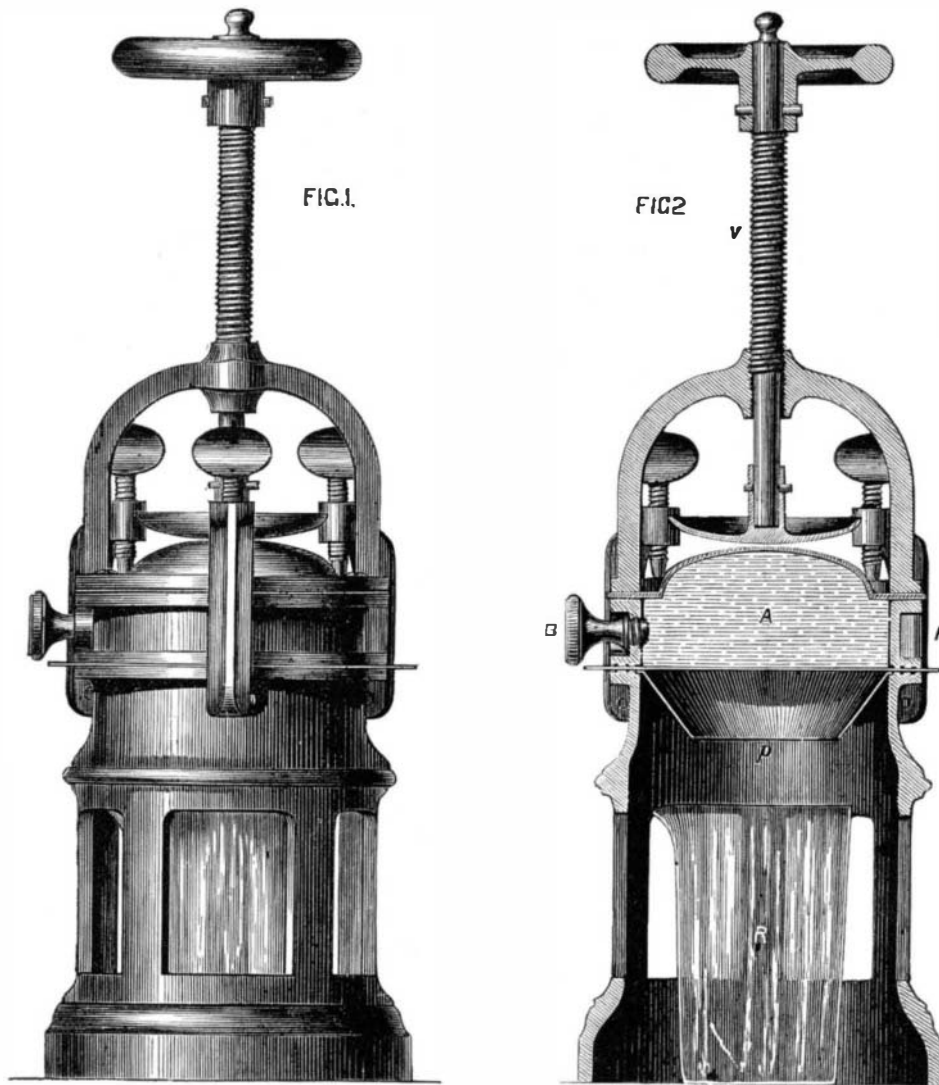
In the annexed engraving is represented a new horseshoe, so formed that the weight of the animal is thrown on its outer edge, which portion offers the principal support to the



hoof. This peculiar construction is obtained by means of a specially devised swage, the use of which will be understood from the following description.

The calks of the shoe are located as usual. The holes for the nails are much further back from the edge than in the ordinary shoe. The portion between the nail holes and edges is flat. The remainder slopes inward, as shown in Fig. 1. The swage is represented in Fig. 2, and has a groove corresponding to the outer part of the shoe, which is here exhibited in section, a ridge for forming the nail hole indentation, and an inclined part corresponding to the like portion of the shoe. The swage is placed on the blank, and on moving it around the outer edge it raises the same, cuts the groove, and forms the concave all at once.

The inventor points out that there is fully three times as much iron on the outside of the nail groove as there is in the



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ordinary shoe. This gives more room for opening, and enables the smith to make the shoe extend out full around the edge of the hoof. The location of the nail holes allows of the nails being driven straight through the hoof instead of in a bowing condition, and thus the clinch can be driven down more solidly.

Patented December 28, 1875. For further particulars address the inventor, Mr. Squire N. Stephenson, Richmond, Bedford county, Tenn., or William T. Frohock, 639 Arch street, Philadelphia, Pa.,

**COLLINS' DOUGH CUTTER.**

Mr. James Collins, the inventor of the improved door check; illustrated elsewhere on this page, has also devised a new doughcutter, the patent for which is now pending through the Scientific American Patent Agency. The implement consists in an outer ring, A, which supports a central tube in which is a spring plunger. The lower end of said plunger is screw-threaded to receive either a solid disk, B, or short hollow cylinder. By means of the outer ring, A, alone, cakes or biscuits of circular form may be cut. When the hollow interior cutter is applied, the device may be employed for forming doughnuts or other articles from which a central circular piece is removed, the implement cutting the outer circumference and removing the inner piece at a single opera-



tion. The solid disk is employed to make the depression in tarts, for the reception of fruit or preserves.

Further particulars may be obtained by addressing the inventor, P. O. box 63, Central City, Colorado Territory.

To make rivets for joining leather hose, use 64 parts copper to 1 part tin.

**A New Method of Swimming.**

A lecture on swimming was lately given at the Marylebone Baths, London, by R. H. Wallace-Dunlop, C.B. The feature of the lecture was the introduction of what was termed plate swimming.

Plate swimming is the fastening of round paddles on to the hands, in size and shape resembling plates; and by this means Mr. Dunlop maintains that great extra power is given to the swimmer. This was abundantly proved by a man swimming across the bath assisted by the plates when he had a heavy weight attached to his neck, when it would undoubtedly have been impossible to have swum without such assistance. Plates or paddles are also attached to the feet, and, the lecturer maintained, are also of great assistance in keeping afloat. Mr. Dunlop spoke in very high terms of Captain Webb's book on swimming, and read several extracts from it—in particular, one that dwells on the importance of learning a style of swimming adapted to keep the swimmer afloat for a long period, rather than to enable him to swim very fast for a short distance, and then succumb. Captain Webb's portrait, when thrown on the sheet, was, of course, well received, and after the lecture the practical working of the plates was shown in the water. Mr. Dunlop will probably lecture again, and we would rather defer till then any detailed criticism on his invention. We feel confident, however, that the plates give increased power in the water in the way of enabling the swimmer to carry, say a rifle and ammunition, but we do not at present feel sure that they will increase speed.

Among the exhibitors in the water was Ainsworth, of the Serpentine Swimming Club, whose peculiar leg stroke was admirably adapted to exhibit the fins or feet plates, or paddles, that were used. There is one point we may mention in connection with this most interesting invention, which is that it is indispensable that ordinary swimming be first learned. We consider this, upon the whole, to be in its favor, as we should be sorry to see artificial means of floating resorted to, which would tend to check persons learning to swim in the ordinary manner.—*Land and Water.*

**COLLINS' DOOR CHECK.**

The annexed illustration represents a novel door check designed for holding doors in any desired position without

the use of blocks, chains, or any attachments which might injure the carpet or floor. It consists of a rubber-headed bolt, A, sliding in a casing and acted upon by a spiral spring which forces it downward. To the upper end of the bolt is pivoted a lever rod connected to a crank. When the latter is carried below its pivot, the spring is free to act and so to cause the bolt to hold the door. When it is desired to throw the device out of action, the crank is raised above the pivot, and is carried by the spring against the stop pin, B, when it holds the bolt securely in elevated position. The invention is easily applied; and in case of the spring becoming weakened by use, a new one is readily inserted.



Patented through the Scientific American Patent Agency, April 25, 1876. For further information address the inventor, Mr. James Collins, P. O. box 63, Central City, Colorado Territory.