No. 751,663. PATENTED FEB. 9, 1904.

W. LIVINGSTONE.

CASTER HORN.

APPLICATION FILED NOV. 29, 1902.

NO MODEL.

Fig. 1.

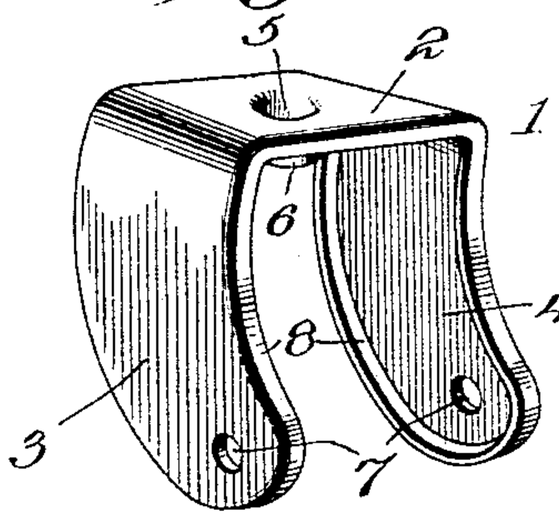


Fig. 2.

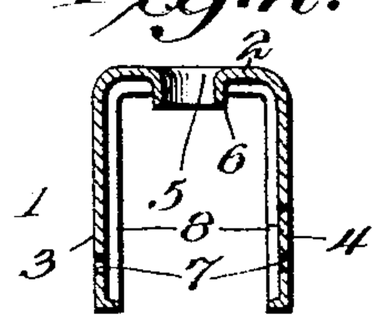


Fig. 3.

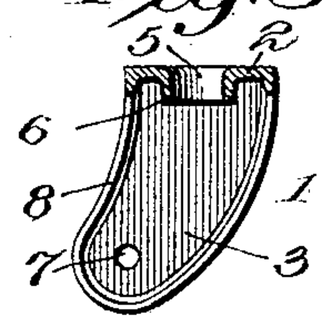


Fig. 4.

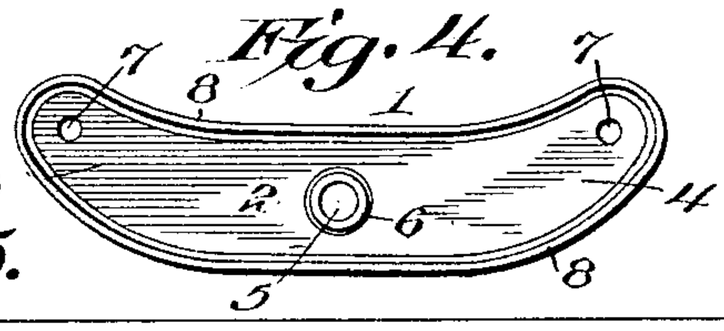
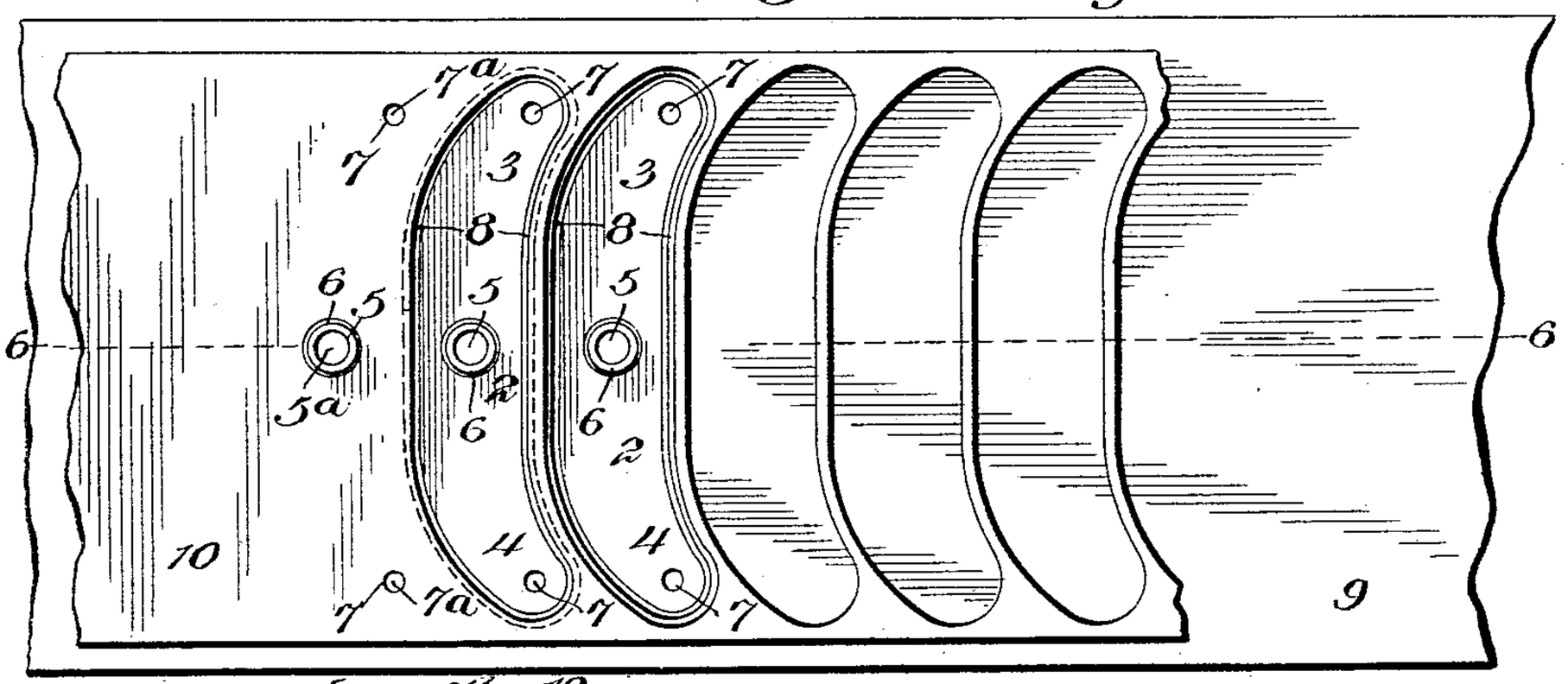


Fig. 5.



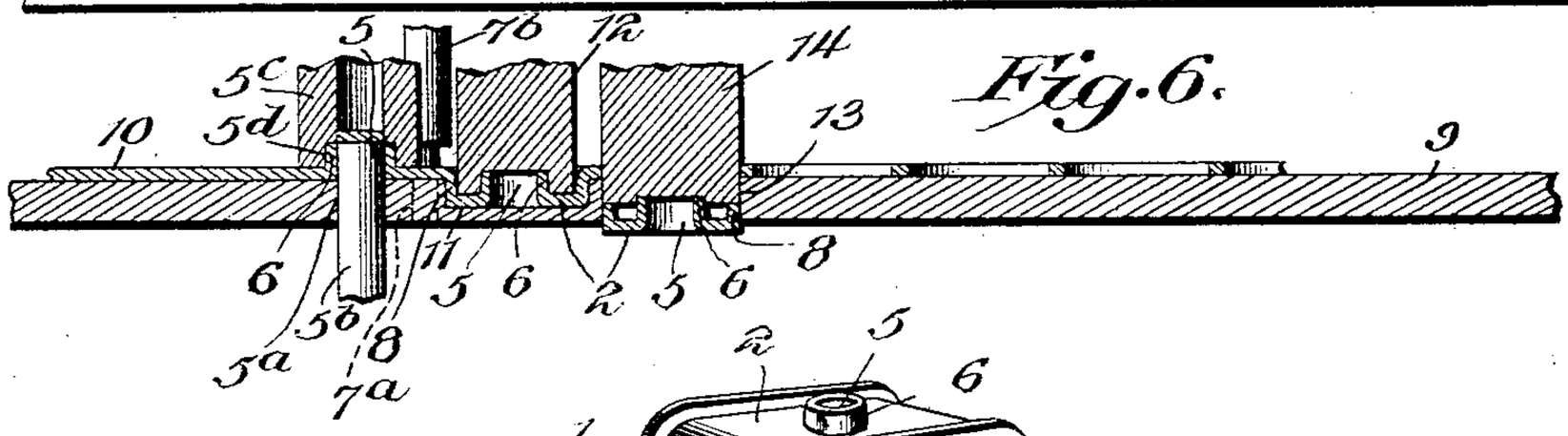
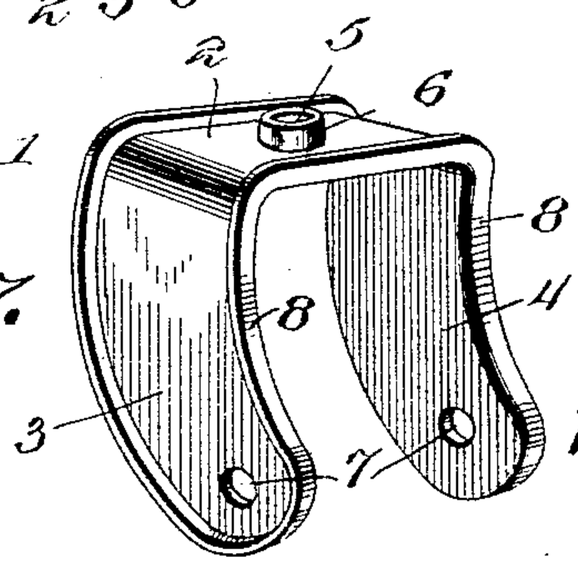


Fig. 6.

Fig. 7.



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No. 751,663. Patented February 9, 1904.

UNITED STATES PATENT OFFICE.

WILLIAM LIVINGSTONE, OF FLUSHING, NEW YORK, ASSIGNOR TO HIMSELF, AND SAMUEL P. PORTER, OF BROOKLYN, NEW YORK.

CASTER-HORN.

SPECIFICATION forming part of Letters Patent No. 751,663, dated February 9, 1904.

Application filed November 29, 1902. Serial No. 133,278. (No model.)

To all whom it may concern:

Be it known that I, WILLIAM LIVINGSTONE, a citizen of the United States, residing at Flushing, in the county of Queens and State of New York, have invented a new and useful Improvement in Caster-Horns, of which the following is a specification.

This invention relates to a novel caster-horn.

The object of the invention is to produce by a simple and economical method a sheet-metal caster-horn stiffened uniformly throughout the shanks and crown by a continuous marginal flange drawn up from the material of the horn-body as distinguished from a stiffening-flange produced by bending up surplus metal provided by forming a blank of greater dimensions than the body of the horn to be made.

Subordinate objects will appear as the nature of the invention is better understood.

In the accompanying drawings, Figure 1 is a perspective view of a caster-horn constructed in accordance with my invention. Fig. 2 is a sectional view thereof. Fig. 3 is a similar view, the section being taken on a line at right angles to the line of section of Fig. 2. Fig. 4 is a detail view of the blank as it is delivered from the press. Fig. 5 is a plan view of the bed or die plate with a stock sheet in position thereon. Fig. 6 is a sectional view on the line 6 6 of Fig. 5 and showing in part the perforating, pressing, and blanking devices capable of being utilized in the practice of the method; and Fig. 7 is a perspective view of a modified form of horn comprehended by my invention.

Like characters of reference are employed to designate corresponding parts throughout the several views.

In order that the relation of my invention to the art may be properly understood, it may be well by way of premise to call attention briefly to the distinguishing characteristics of the horn and the method of its production.

The ends the attainment of which is primarily sought by manufacturers of this class of devices are, first, great durability and stiffness in order that the horn may sustain the weight of a heavy article of furniture for the support of which it may be employed; second, simplicity of construction, whereby the employment of skilled labor may be dispensed with, and, third, economy in the consumption of stock. With a view to the attainment of these ends the old method of molding or casting and subsequently finishing the horn has given place to the more economical methods of producing caster-horns from sheet metal by the process of blanking and forming in the dies of a press. Such of these horns as have come to my attention are inefficient, first, because as ordinarily constructed they lack the requisite stiffness and durability; second, because of the necessity for the employment of heavy and expensive stock; third, because the usual efforts to stiffen the horn have been directed to the reinforcement of the crown by a separate piece of sheet metal or by enlarging the crown part of the horn-blank to permit it to be drawn cup-shaped downward, both of which not only involve a waste of stock, but also additional expense for labor in the manufacture of the horn, and, fourth, because when attempts have been made to secure additional strength by flanging or corrugating the horn-body the requisite stiffness has not been attained without considerable waste of material resulting from the general design of blank required and from the necessity for producing a blank of greater dimensions than the body of the horn in order to secure surplus metal for the stiffening-flanges. Having in mind these various objections to the usual forms of sheet-metal horns, my invention is directed to the production of a horn requiring a blank the general contour of which will serve to minimize the waste of stock, the requisite stiffness of which will be secured by a flange extending continuously around the margin of the horn, including both the shanks and the crown thereof, and the cost of manufacture of which will be minimized by drawing up the marginal flange from the body of the horn instead of producing said flange from surplus metal resulting from the formation of a blank of abnormal size.

The horn 1 comprises the crown-plate 2,

from the opposite ends of which depend the parallel shanks 3 and 4, integral with the crown-plate and slightly curved longitudinally, as shown. The crown-plate is formed with a central opening 5 for the reception of a spindle, (not shown,) and from the margin of this opening extends at right angles to the crown-plate an annular bearing flange or bushing 6, drawn from the plate. The caster-wheel (not shown) is designed to be received between the shanks 3 and 4, and the latter are therefore provided at their lower ends with alined openings 7 for the reception of the wheel-trunnions or for a rigid wheel-pin, as the case may be, it being understood that the particular mounting of the caster-wheel is immaterial, so far as my invention is concerned.

The horn is constructed from comparatively thin sheet metal, and the requisite stiffness both of the crown-plate and shanks and of their connections is secured by a marginal flange, web, or bead 8, extending continuously around the entire margin of the horn and disposed at an angle to the body thereof. This flange 8 is not formed by merely bending up the outer edge of the blank, but is drawn up from the body of the blank, so that the flanged horn is produced in its entirety from a blank having no greater dimensions than the body portion of the horn. In other words, the production of my stiffening-flange is not accompanied by a corresponding consumption of the stock. Obviously it is immaterial whether the flange 8 extends downwardly from the crown-plate and inwardly from the shanks, as shown in Fig. 1, or upwardly from the plate and outwardly from the shanks, as shown in Fig. 7, and it is likewise immaterial whether the bushing extends above or below the plate.

In order that the essence of the invention may be clearly comprehended, I have illustrated in Figs. 5 and 6 of the drawings a portion of one form of mechanism which may be employed in the production of my improved horn. A suitable bed or die plate 9 is provided with an opening 5^a and similar openings 7^a of somewhat smaller size. The opening 5^a is designed to accommodate a punch 5^b, which moves upwardly through the bed 9 and is received within the lower end of a die 5^c, located above the bed. The openings 7^a are disposed to accommodate the descending punches 7^b. A sheet-metal stock plate 10 of the proper thickness and of a width slightly greater than the length of the blank to be produced is placed upon the bed 9 and is fed forward to a position over the openings 7^a and 5^a, which correspond in their relative positions to the openings 5 and 7 of a horn-blank. The plate being in position, the punches 7^b descend to form the openings 7 in the plate and the punch 5^b ascends. As the die 5^c is counterbored at its lower end, as indicated at 5^d, the punch will draw up the annular flange 6, surrounding the opening or perforation 5, produced by the punch. The punches and die having been retracted the stock plate will be advanced to bring the perforated portion thereof opposite a depression 11, formed in the surface of the bed 9 and corresponding in size and form to the body of the horn to be produced. Into this depression the metal for the formation of the blank is dropped or depressed by a presser 12, corresponding in form with the contour of the depression, but of slightly-smaller size, in order to leave a narrow space between its side face and the side walls of the depression. As the metal is forced down into the depression 11 it will be stretched or drawn up to produce the marginal flange 8 by the drawing out of the metal. This peculiarity of the method results in the production of a blank having a marginal flange without necessitating that waste of metal which would be necessary if the flange were turned up from surplus metal secured by cutting out a blank of greater dimensions than the body of the horn to be produced. Obviously this metal drawn up between the opposed side faces of the depression 11 and the presser 12 will not be of uniform thickness, but, on the contrary, will be drawn out to a tapering or wedge-shaped cross-sectional contour, as shown. The presser having been retracted, the stock plate is again moved forward to permit the depressed portion thereof to drop into an opening 13, formed in the bed 9 and corresponding exactly in contour and dimensions with the depression 11. Above the opening 13 is arranged a punch 14 exactly corresponding with the opening 13 and arranged to be brought down, as indicated in Fig. 6, to sever the completed horn-blank from the stock sheet. The blank shown in Fig. 4 will then be bent to produce the parallel shanks and the surmounting and connecting crown-plate 2, as shown in Fig. 1 of the drawings. Of course in practice the punches, the die, and the presser will all operate simultaneously, so that the three operations of perforating the metal, depressing a perforated blank, and severing a depressed blank from the sheet will be effected simultaneously, to the end that each operation of the press will be accompanied by the discharge of a completed blank.

I wish it to be distinctly understood, however, that the invention is not limited to any particular mechanism for punching, pressing, or cutting the blank, since the construction of a caster-horn with a drawn marginal flange may be effected in a variety of ways. It is furthermore immaterial, so far as the broad aspect of the invention is concerned, whether the flange is turned inward or outward or whether the bushing is turned in one direction or the other or entirely omitted. In other words, I wish to be understood as distinctly reserving the right to effect such changes, modifications, and variations of the illustrated structure as may be fairly embraced within the scope of the protection prayed.

What I claim is—

1. A sheet-metal caster-horn constructed from a single piece of metal and having a drawn stiffening-flange extending continuously around its entire margin.

2. A sheet-metal caster-horn having a drawn marginal flange of tapering cross-sectional contour which extends continuously around the entire margin of the horn.

3. A sheet-metal caster-horn constructed from a single piece of metal bent to form a crown-plate and a pair of shanks, and having a continuous drawn flange extending from the edges of the shanks and crown-plate, and an annular flange or bushing extending from the crown-plate.

4. A sheet-metal caster-horn constructed from a single piece of metal bent to form an apertured crown-plate and a pair of apertured shanks, and having an annular bushing extending from the crown-plate, and a drawn flange of tapering cross-sectional contour extending continuously around the edges of the shanks and plate.

5. A sheet-metal caster-horn constructed from a single piece of metal and stiffened uniformly throughout the shanks and crown by a continuous marginal flange drawn up from the material of the horn-body.

In testimony that I claim the foregoing as my own I have hereto affixed my signature in the presence of two witnesses.

WILLIAM LIVINGSTONE.

Witnesses:

A. S. TEN EYCK,

H. F. BRABSON.