2 Sheets—Sheet 1.

E. FISHER.

Dies for Forming Metallic Horse-Collar Frames.

No. 220,594. **Patented Oct. 14, 1879.**

Fig. 1.

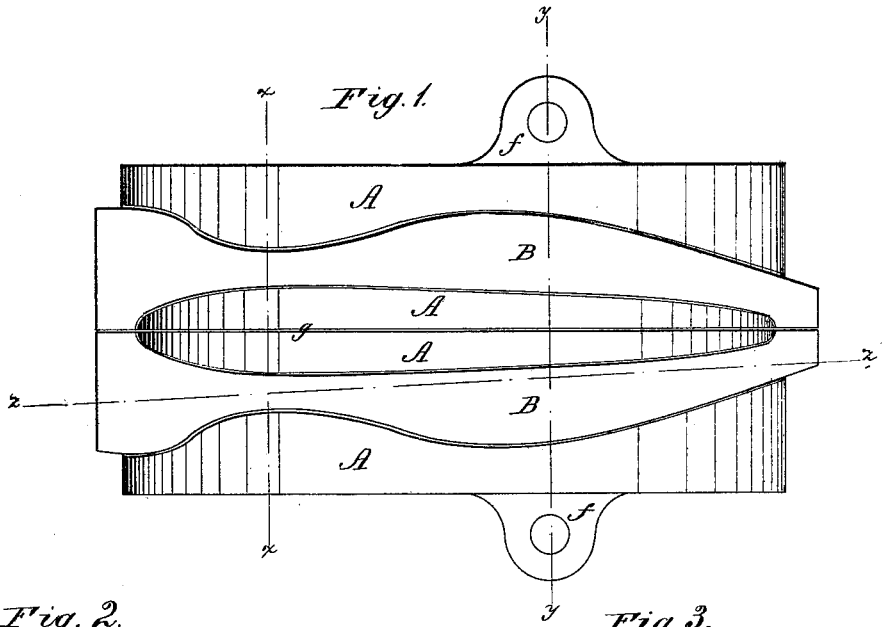

Fig. 2.

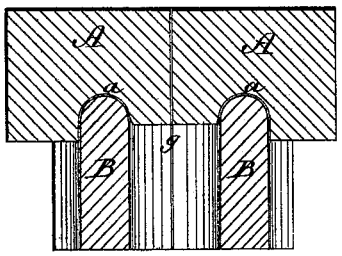

Fig. 3.

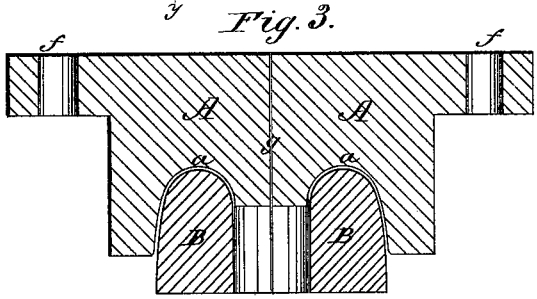

Fig. 4.

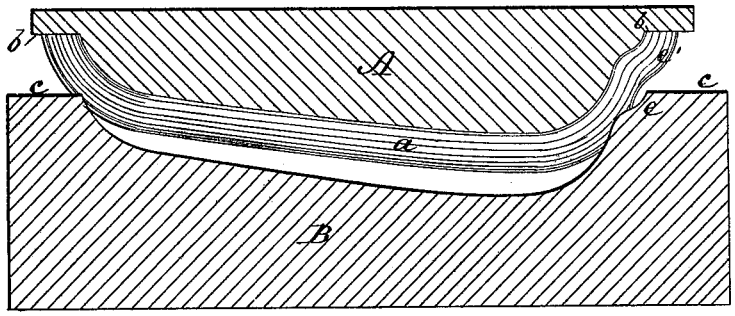

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Fig. 5

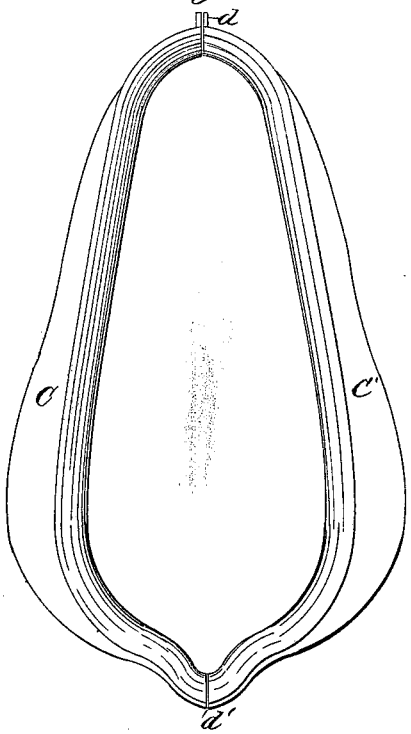


Fig. 6

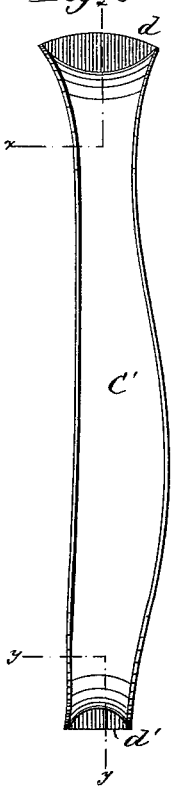


Fig. 7.

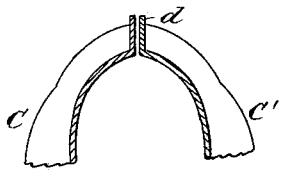
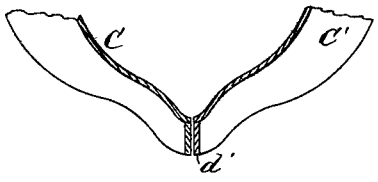


Fig. 8.



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UNITED STATES PATENT OFFICE.

EBENEZER FISHER, OF KINCARDINE, ONTARIO, CANADA.

IMPROVEMENT IN DIES FOR FORMING METALLIC HORSE-COLLAR FRAMES.

Specification forming part of Letters Patent No. **220,594**, dated October 14, 1879; application filed July 16, 1879; patented in Canada, August 19, 1879.

To all whom it may concern:

Be it known that I, EBENEZER FISHER, of Kincardine, Province of Ontario, Canada, have invented a new and useful Improvement in Dies for Pressing Metal Horse-Collars, and in the collar or collar-frame produced by the dies; and I do hereby declare that the following is a full, clear, and exact description of the same.

My invention relates, first, to an improvement in the class of dies for forming metal plates into the shape required to adapt them to form the sides of a horse-collar.

The invention relates, secondly, to the product of the dies—to wit, an improved metal (steel) collar or collar-frame.

The dies are represented in accompanying drawings, in which Figure 1 is a plan view of the dies inverted. Figs. 2 and 3 are vertical cross-sections on lines *x x* and *y y*, respectively, of Fig. 1. Fig. 4 is a longitudinal section on the line *z z* of Fig. 1. Fig. 5 is a front view of the collar whose plates are produced by the dies. Fig. 6 is a side view of the same. Figs. 7 and 8 are detail sections on lines *x x* and *y y*, respectively, of Fig. 6.

A A indicate the upper or receiving dies, into which the steel collar-plates are pressed, and B B are the lower penetrating or entering dies.

The upper dies, A, have each an irregular groove or cavity, *a*, which exactly conforms to the desired contour of one-half of the metal collar-frame shown in Figs. 5 and 6—that is to say, one die A corresponds to one side, C, and the other die A to the other side, C′, of the collar-frame. The upper surface of the lower dies, B, exactly corresponds in shape to these cavities *a* of the receiving-dies A A, so that when the respective upper and lower dies, A B, are brought together by the action of the press (not shown) the steel plates (not shown) which are placed between them will necessarily be pressed into the same shape as the two opposing acting surfaces of the dies. Thus the product of the operation of the press will be the complete metal collar-frame C C′, Fig. 5.

My improvement relates more particularly to the construction of the ends of the dies A B, whereby they are adapted to form the two longitudinal parts of a collar having the flanges or parallel end portions formed in one piece with the body of such parts. The dies A terminate at each end in a plane surface or horizontal portion, *b*. The entering or lower dies, B, have like flat surfaces *c* formed on their raised ends. When the two sets of dies are brought together these plane surfaces *b c* will press the ends of the collar-plates out flat. These flat ends *d d′* of said plates form what may be termed flanges, which, when the halves or two sides C C′ of the collar-frame are put together, project from each end of the collar-frame and lie in contact, as shown in Figs. 5, 7, 8. The flanges being thus formed in one piece with the body or main portion of the parts C C′, the collar-frame thereby produced has minimum strength at the points where metal collars are usually weakest. Yet the weight of the collar-frame is reduced to a minimum, since the thickness of the metal is not increased by reason of the flanges being formed solid with the parts C C′.

In my Patent No. 216,168, dated June 3, 1879, I describe a metal horse-collar having vertical flanges on the ends of its longitudinal parts; but in such collar the said flanges are made separate from the sides of the collar and attached thereto. That collar is hence defective in strength at the points where strength is most requisite, and is, besides, of undue weight, in consequence of the required thickness of the flanges and the ends of the sides.

My present improvement or collar-frame has proven very superior in practical use, and is produced entire from a thin steel plate or plates at one operation of the dies, so that its cost is small.

Said flanges will in practice be provided with suitable perforations to receive screw-bolts, which, being inserted through them, will hold the two parts of the collar firmly together.

It will be observed that a depression, *e*, is formed in the entering-dies, B B, at a point contiguous to the flat surfaces *c*, and that the bed of the cavity *a* of the receiving-dies A has a like or corresponding projection, *e′*. The object of this construction is to form a bend or enlargement in the collar-frame C C′ to accommodate the wind-pipe of the horse or other draft-animal to which the collar may be applied.

For convenience and rapidity of operation,