(No Model.)

S. FOX.

APPARATUS FOR THE MANUFACTURE OF HORN PLATES.

No. 346,539. Patented Aug. 3, 1886.

Fig. 1.

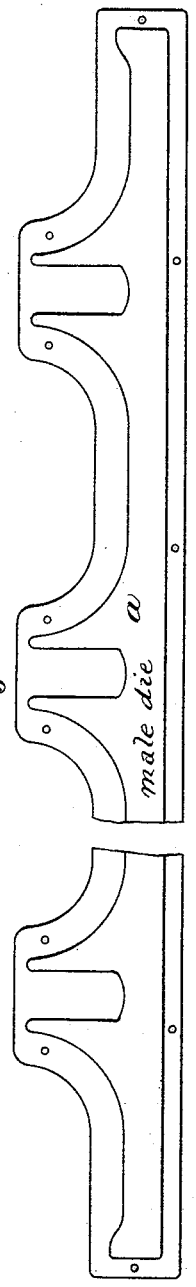


Fig. 2.

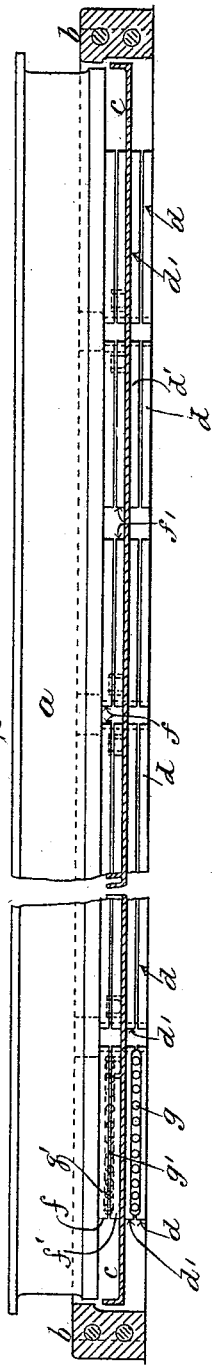
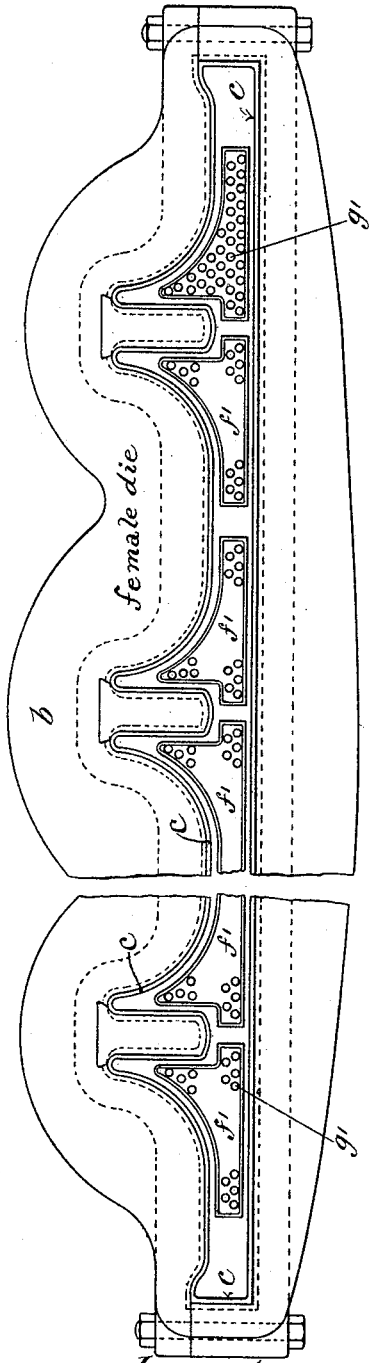


Fig. 3.



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APPARATUS FOR THE MANUFACTURE OF HORN-PLATES.

SPECIFICATION forming part of Letters Patent No. 346,539, dated August 3, 1886.

Application filed January 19, 1886. Serial No. 189,070. (No model.) Patented in Belgium January 5, 1886, No. 71,504; in France January 5, 1886, No. 173,349, and in Canada February 2, 1886, No. 23,318.

To all whom it may concern:

Be it known that I, SAMSON FOX, a subject of the Queen of Great Britain and Ireland, and residing at Harrogate, county of York, Kingdom of Great Britain, have invented a new and useful Improvement in Apparatus for the Manufacture of Frame or Horn Plates, which improvements are fully set forth in the following specification, reference being had to the accompanying drawings, forming a part thereof. The same has been patented in the following countries: Belgium, January 5, 1886, No. 71,504; France, January 5, 1886, No. 173,349, and Canada, February 2, 1886, No. 23,318.

In the drawings annexed, Figure 1 represents a face view of the male die *a*. Fig. 2 is a sectional elevation showing the male and female dies *a* and *b*, the gripping or holding apparatus *d d'* and *f f'*, with anti-friction balls *g* and *g'* between the respective series thereof, also an interposed frame or horn plate, *c*. Fig. 3 is a plan, the male die being removed, showing the horn-plate *c*, the bottom gripping-plate, *f'*, of the upper series, and the balls *g'*.

A frame or horn plate, *c*, of the desired form, with flange or flanges to give it the required strength and rigidity, is made of a single plate of metal by pressing or stamping. For this purpose I use a female die or matrix, *b*, having an internal configuration corresponding to the external form required to be imparted to the frame-plate, and in conjunction with this female die or matrix I use a male die, *a*, of corresponding external form, but smaller to such an extent that when the male die is within the female die or matrix there shall remain between them a space or spaces of a width corresponding to the thickness of plate to be operated upon, such space extending entirely around the male die when the frame or horn plate is to be made with a single flange extending entirely around it. By hydraulic or other power one or both of the dies is or are operated, so that a plate pressed between them has its edges turned up or flanged—for example, as represented in Figs. 2 and 3—and passes into or through a female die onto supports able to move freely in all directions parallel with the face of the flanged plate.

The female die *b* is of annular form—that is to say, it has no bottom, but is open at both sides. The edge of the opening of this die, at its upper side, for imparting the exterior configuration to a frame or horn plate to be produced, is slightly rounded, to admit of a blank plate (which is placed thereon while in a hot state) being easily pressed therein, and is enlarged or backed for a portion of its depth toward its bottom side, so that when a plate has been pressed into it it will be free from contact with the interior thereof. The said die *b* rests upon the fixed bed of a press, or when the lower part of the press is a movable one, then upon it. The bottom gripping-plates, *d*, also rest upon the same part of the press, balls *g* are placed upon the plates *d*, and the plates *d'* placed upon them. These are now ready to receive the frame or horn plate *c* when it has been pressed through the forming part of the die *b* by the action of the male die *a* upon the upper surface of the blank plate. The male die *a* is next caused to recede from the newly-pressed plate, and the plates *f'* of the upper series of gripping-plates are placed in position upon the newly-flanged plate, balls *g'* placed thereon, and the upper series of gripping-plates, *f*, are placed upon the balls. The male die *a* is caused to press upon the upper gripping-plates, *f*, with just sufficient force to clamp the newly-formed frame or horn plate, and to prevent its warping or buckling during cooling. The plates *d* and *f*, which are in immediate contact with the press, (and which may be permanently fixed thereto,) are of course without lateral movement, while the plates *d'* and *f'*, in contact with the frame or horn plate *c*, can, by the rolling action of the anti-friction balls between the two series of gripping-plates, move along with the frame or horn plate *c* during its cooling and contraction.

The space occupied by the thickness of the upper series of gripping-plates, *f f'*, and the balls between them being greater than the depth of the flange formed on the frame or horn plate, it will be obvious that the male die *a* does not re-enter within the flange, and consequently does not interfere with the contraction thereof.

As is evident, the forms, proportions, and dimensions of the dies will depend upon the precise form of frame or horn plate to be produced.

What I claim is—

1. In a machine for the manufacture of frame or horn plates for rolling-stock, the combination of a male die, a female die, means for operating one or both of said dies, so as to force a heated plate into and through the female die in such a manner as to impart the required form to such plate and to flange the same, and means for receiving the flanged plate and holding it with a sufficient grip or squeeze to prevent warping or buckling, while admitting of the contraction due to cooling, substantially as described.

2. The holding or gripping blocks or plates *d d'* and *f f'*, with anti-friction balls between them, substantially as described, and for the purpose specified.

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