

J. T. KIMBALL.
EMBOSSING PRESS.
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1,268,360.

Patented June 4, 1918.

Fig. 1

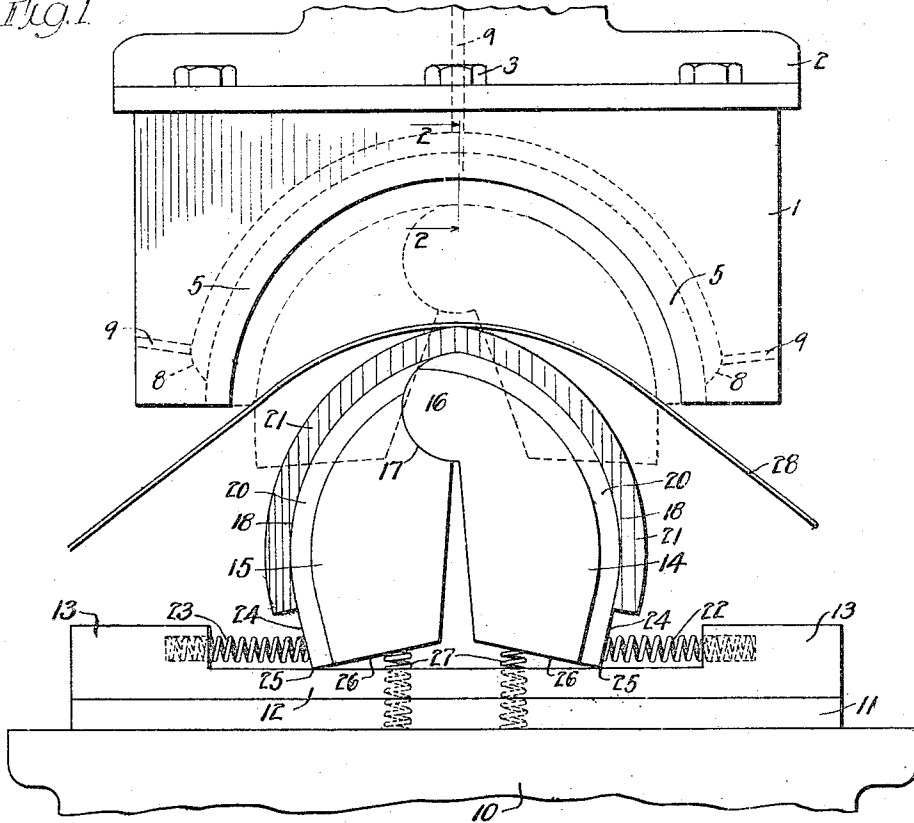


Fig. 2

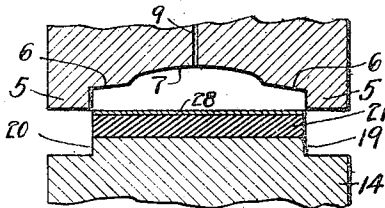
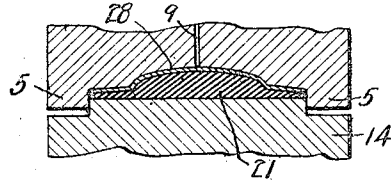
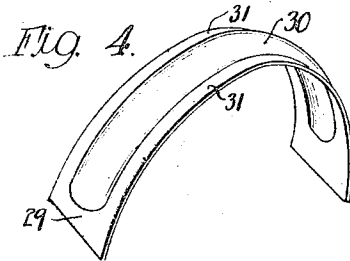


Fig. 3



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EMBOSSING-PRESS.

1,268,360.

Specification of Letters Patent.

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To all whom it may concern:

Be it known that I, JOHN T. KIMBALL, a citizen of the United States, and a resident of Detroit, in the county of Wayne and State of Michigan, have invented a new and Improved Embossing-Press, of which the following is a specification.

This invention relates to a press for embossing sheet metal members of substantially semi-circular form, particularly mud-guards for the wheels of motor vehicles; but it is to be understood that presses embodying the operative principles of my invention may be designed for embossing various other shapes.

Generally speaking, the invention comprises a female die and a collapsible male die that is adapted to be received by the female die; and it consists in the details of construction shown, described and particularly pointed out in the claims.

In the drawings, Figure 1 is a side elevation showing the dies of the press separated and a sheet of stock in place. Fig. 2 is a fragmentary section on the line 2—2 when the dies are almost in engagement with one another. Fig. 3 is a similar section showing the dies fully in engagement. Fig. 4 is a perspective view of a sheet of metal (a mud-guard) curved and embossed by this press.

In the embodiment shown, 1 indicates a female die secured to a fixed frame 2 by the bolts 3, or in any other manner. This die is of rectangular shape and has extending transversely across its lower face an opening, substantially semi-cylindrical in longitudinal cross-section, provided on each edge with a downwardly and inwardly extending rib 5 between which are formed the surfaces 6 that may be slightly inclined in respect to the axis of the semi-cylindrical opening. Between the surfaces 6, the die is concave in transverse cross-section; as indicated at 7, to form a somewhat shallow groove, said concavity terminating at each side at about the curved lines 8 (Fig. 1) and corresponding to the embossed upper surface of the proposed mud-guard. The concavity is preferably connected by the small vent passages 9 with the outer surfaces of the die.

Below the female die is a vertically reciprocable support comprising a base 10

having secured thereto the intermediate plate 11 and the face plate 12, the latter being provided with the upstanding abutments 13. It will be understood, however, that any other form of support may be used. Mounted upon the face plate is a male die comprising the members 14 and 15, the former having at its upper end the substantially semi-cylindrical projection 16 that is received in the correspondingly curved bearing 17 in the member 15, the arrangement being such that the lower ends of the dies may swing outwardly about the center of the projection 16. The outer face 18 of each of the die members 14 and 15 is curved to form substantially a quadrant of a cylinder, the radius of which is equal to the radius of curvature of the curved opening in the female die. In some cases the faces 18 may each be of an angular length greater than ninety degrees, as it is found that the device will operate to emboss plates of more than one hundred and eighty degrees curvature. The faces 18 have portions of their edges removed to form shoulders 19 and 20 to receive the ribs 5 on the female die, the purpose of this construction being to confine the thick sheet of rubber 21 as the male die approaches the female die. This rubber sheet extends angularly throughout the whole surface of contact of the dies, and laterally for some distance on each side of the edge of the concavity in the female die, preferably to the shoulders 19 and 20.

While the male members 14 and 15 have working faces 18 of substantially quarter-cylindrical shape, as stated, their adjacent sides are cut away to allow the lower ends of the members to approach each other, that is, so that they may collapse until the distance between them is considerably less than the length of the diameter of the cylinder to which they conform; and they are normally held in this collapsed relation by the compression springs 22 and 23 that are seated in openings in the abutments 13. The opposite ends of these springs contact with the extensions 24 of the surfaces 18, which extensions may be continuations of the cylindrical surfaces or of any other desired shape. The extensions terminate in the edges 25 that rest upon the plate 12; and from each of these edges the lower surface

26 of the respective male member extends inwardly and upwardly when in normal position, as shown in full lines in Fig. 1. It is preferred to cushion these surfaces upon
5 compression springs 27 that are seated in the plates 11 and 12.

As shown, the outer surface of the projection 16 and the bearing 17 in which it is received are formed on a relatively large
10 radius, and merge into the surfaces 18 substantially tangentially therewith at the point where the latter are joined to each other, thereby largely avoiding wear to which the sheet or pad 21 would otherwise
15 be subjected because of the swinging movement of the male members.

Operation.

When the male die is at the lower limit of
20 its movement, the parts assume the positions shown in full lines in Fig. 1. A piece of sheet metal stock 28 of proper length is placed upon the surface of the rubber 21, and the support 10 is elevated. As it approaches the upper limit of its movement,
25 the sheet 28 comes into contact with the uppermost portion of the surfaces 6 of the female die, the shoulders 19 and 20 having come into registering engagement with the
30 ribs 5 to confine the rubber and prevent it from flowing laterally. As the support rises still farther, the upper portion of the rubber is compressed and the members 14 and 15 of the male die are thereupon spread
35 apart laterally, turning about the center of the cylindrical projection 16 to compress the rubber throughout its angular length. In this operation the cross-section of the rubber assumes the form indicated in Fig. 3,
40 and the central portion of the metal sheet is distended to correspond to the concavity in the female die.

The parts are so proportioned that when the support substantially reaches the upper
45 limit of its movement the lower ends of the members of the male die are spread apart far enough to bring the surfaces 26 into contact throughout with the upper surface of the face plate 12. This arrangement overcomes any tendency of the mem-
50 bers to spread apart farther and effectually prevents wedging or jamming of the male die in the female die. As the support is backed away from the female die, the resiliency of the rubber together with that of the
55 springs causes the male members to collapse and free themselves from the female die, and the stock is thereafter removed in the form of the mud-guard 29 having the embossed or crowned central portion 30 (Fig. 4) and the flat or inclined edges 31.

It is obvious that many changes may be made in the details of construction without departing from the spirit of my invention;
65 for example, it is obviously merely a matter

of choice which one of the dies is movable and which stationary. I do not, therefore, desire to be limited otherwise than as indicated by the subjoined claims.

I claim:—

1. A press comprising a female die hav-
70 ing an opening therein curved in longitudinal cross-section and also curved in transverse cross-section, a support, one of said members being movable toward and from
75 the other, an inwardly extending rib on the female die along each edge of the curved opening, a collapsible male die carried by the support and adapted to be received in the opening in the female die, said male die
80 comprising two members having cooperating bearing surfaces at the end nearest the female die whereby they are operatively joined, and having outer surfaces curved to correspond to the longitudinal curvature of
85 the boundary of the opening in the female die, said male members also having shoulders adapted to form a close joint with the ribs on the female die, a sheet of resilient material upon the surface of the male die
90 between the shoulders, each of the members of the male die being provided with an edge along which it normally contacts with the support, said edges being so positioned as to cause the ends of the members of the
95 male die opposite the ends on which the bearing surfaces are formed to separate when pressure is applied to the last mentioned end of the male die by the female die, and each of said members being also pro-
100 vided with a surface that comes into engagement with the support and limits the distance the ends of the members may separate, whereby wedging of the male die in the female die is avoided.

2. A press comprising a female die hav-
ing an opening therein curved in longitudinal cross-section and also curved in transverse cross-section, a support, one of said
110 members being movable toward and from the other, an inwardly extending rib on the female die along each edge of the curved opening, a collapsible male die carried by the support and adapted to be received in the opening in the female die, said male die
115 comprising two members having cooperating bearing surfaces at the end nearest the female die whereby they are operatively joined, and having outer surfaces curved to correspond to the longitudinal curvature of
120 the boundary of the opening in the female die, said male members also having shoulders adapted to form a close joint with the ribs on the female die, a sheet of resilient material upon the surface of the male die
125 between the shoulders, each of the members of the male die being provided with an edge along which it normally contacts with the support, said edges being so positioned as to cause the ends of the members of the
130

male die opposite the ends on which the bearing surfaces are formed to separate when pressure is applied to the last mentioned end of the male die by the female die, each of said members being also provided with a surface that comes into engagement with the support and limits the distance the ends of the members may separate, whereby wedging of the male die in the female die is avoided, and resilient members carried by the support and upon which the last mentioned surfaces of the members of the male die rest.

3. A press comprising a female die having an opening therein curved in longitudinal cross-section and also curved in transverse cross-section, a collapsible male die adapted to be received in the opening in the female die, one of said dies being movable toward and from the other, said male die comprising two members having cooperating bearing surfaces at the end nearest the female die whereby they are operatively

joined, and having outer surfaces curved to correspond to the longitudinal curvature of the boundary of the opening in the female die, a sheet of resilient material upon the surface of the male die, means for causing the other ends of the members of the male die to spread apart as the movable die approaches the other die, and means for limiting the spreading of said other ends of the members of the male die whereby wedging of the male die in the female die is avoided, said female die having passages therein for allowing the escape of air from between it and the sheet of resilient material as the movable die approaches the other die.

In testimony whereof I have signed this specification in the presence of two subscribing witnesses.

JOHN T. KIMBALL.

Witnesses:

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L. M. SPENCER.

Copies of this patent may be obtained for five cents each, by addressing the "Commissioner of Patents, Washington, D. C."