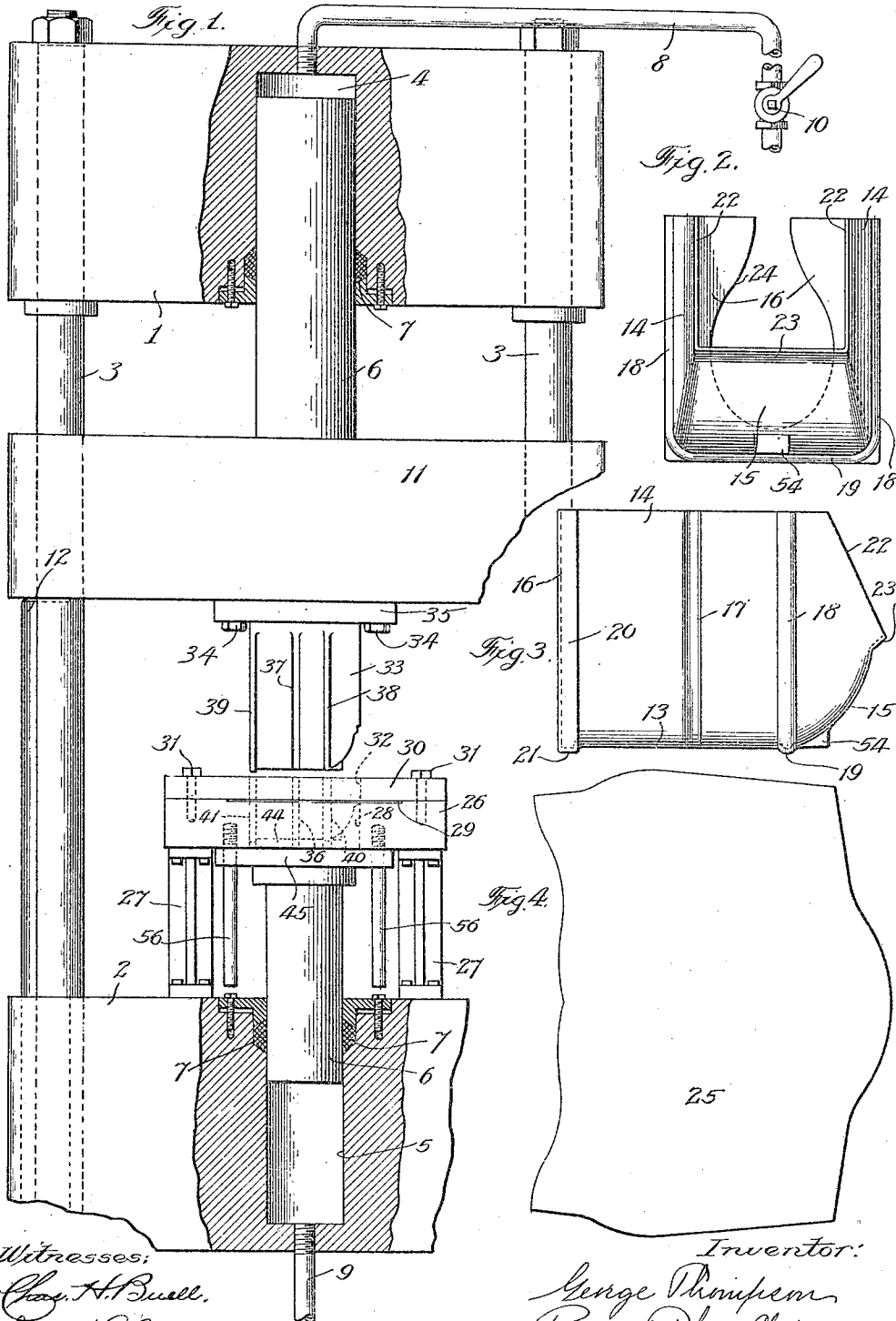


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DIE PRESS FOR FORMING RAILWAY CAR JOURNAL BOXES.
APPLICATION FILED AUG. 9, 1913.

1,106,902.

Patented Aug. 11, 1914.

2 SHEETS—SHEET 1.



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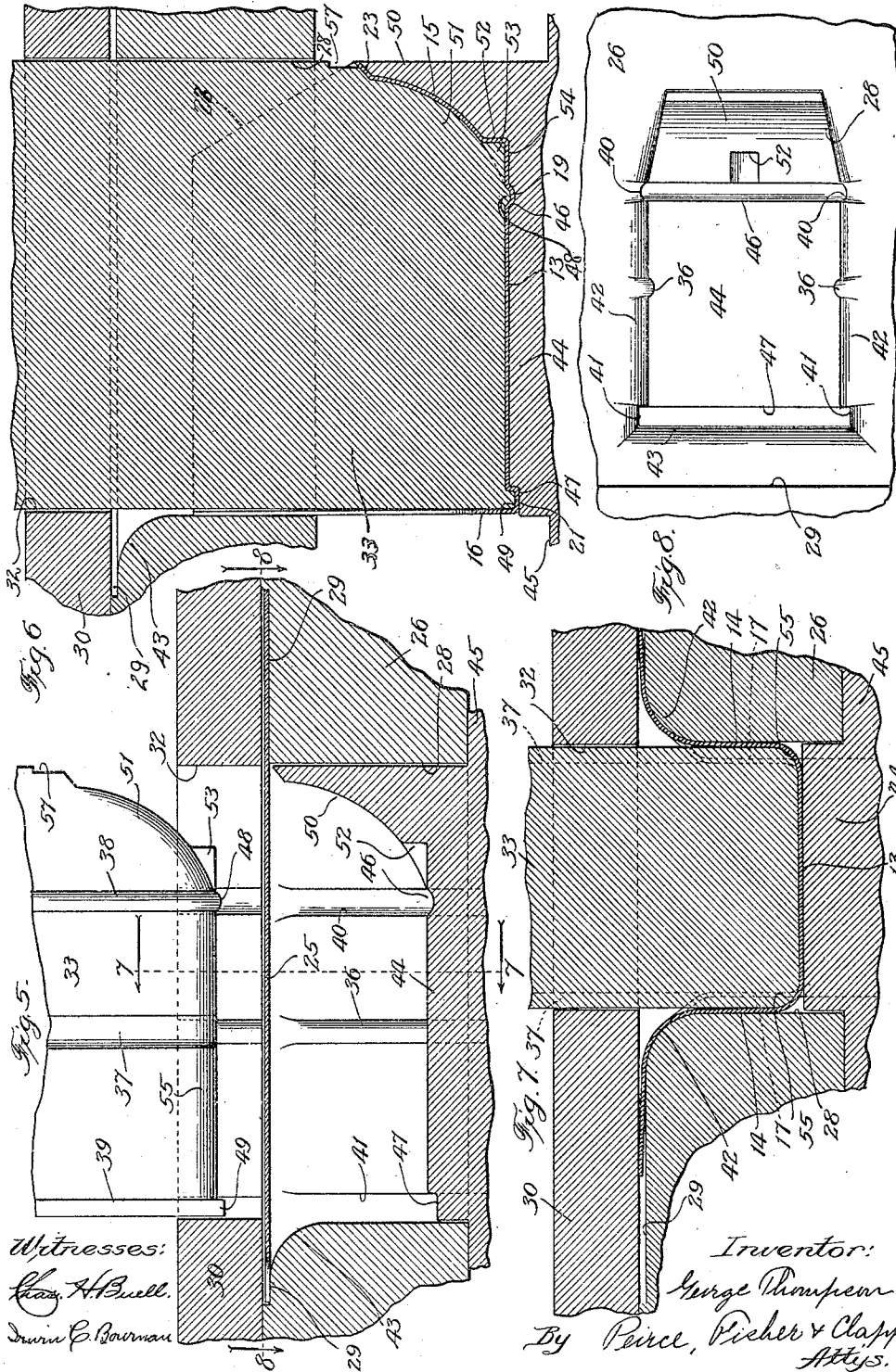
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2 SHEETS-SHEET 2.



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UNITED STATES PATENT OFFICE.

GEORGE THOMPSON, OF CHICAGO, ILLINOIS.

DIE-PRESS FOR FORMING RAILWAY-CAR JOURNAL-BOXES.

1,106,902.

Specification of Letters Patent.

Patented Aug. 11, 1914.

Application filed August 9, 1913. Serial No. 784,002.

To all whom it may concern:

Be it known that I, GEORGE THOMPSON, a citizen of the United States, and a resident of Chicago, county of Cook, and State of Illinois, have invented certain new and useful Improvements in Die-Presses for Forming Railway-Car Journal-Boxes and the like, of which the following is a full, clear, and exact description.

The improvement relates to die presses for forming railway car journal boxes and seeks to provide a simple and effective construction with an improved arrangement of dies whereby the body portion of the journal box can be formed at a single operation.

The invention consists in the features of improvement hereinafter set forth, illustrated in the preferred form in the accompanying drawings and more particularly pointed out in the appended claims.

In the drawings, Figure 1 is a side elevation of the improved die press with parts shown in section. Figs. 2 and 3 are front and side views of the journal box body formed by the improved machine. Fig. 4 is a plan view of the blank from which the journal box is formed. Fig. 5 is an enlarged detail view showing the female and supporting dies in section and the male die in side elevation and with the flat blank in position in the female die. Fig. 6 is a similar view with the supporting and male dies in the position assumed in completing the formation of the journal box. Fig. 7 is a cross-section on the line 7-7 of Fig. 5 with the male die at the end of its initial movement. Fig. 8 is a plan view of the female die looking in the direction of the arrows 8-8 of Fig. 5.

The die press, as usual, comprises upper and lower heads 1 and 2 connected by upright posts or guide rods 3. The heads are bored out to form hydraulic cylinders 4 and 5 which are provided with suitable plungers 6 and stuffing boxes 7. Pipes 8 and 9 connect the cylinders to a suitable source of supply of oil or water under pressure and the supply pipe 8 of the upper cylinder is provided with a suitable controlling valve 10. A cross-head 11 is fixed to the lower end of the plunger 6 of the upper cylinder and its movement is guided by the rods 3. The cross-head 11 is forced downwardly by admitting liquid under pressure to the upper cylinder. The return movement of the head 11 is effected in the usual manner by hydrau-

lic plungers, such as indicated at 12, that extend upwardly from the lower head 2 and engage the under face of the cross-head. The parts thus far described may be of any usual or suitable construction.

The present improvement is designed to form the body of a railway car journal box from a flat blank of sheet metal. The box body constructed by the improved machine is similar in form to the standard journal boxes now in use and comprises a bottom wall 13, side walls 14, a short, lower front end wall 15 and a back end wall 16. The side walls are provided near the center of the box with vertical grooves or recesses 17 which engage the fastening bolts by which the journal box is held in position upon the truck. Near the front of the box, the side walls are provided with vertical strengthening ribs 18 which merge into a transverse strengthening rib 19 at the lower front portion of the bottom wall 13. At the rear edge of the box, the side walls 14 are provided with outwardly projecting, vertical ribs 20 which are substantially rectangular in section and which merge into a corresponding horizontal rib 21 that extends across the rear edge of the bottom wall 13. The ribs 20 and 21 serve to strengthen the box and also form a seat for the usual dust guard. The forward portions of the side walls of the box are contracted, as most clearly shown in Fig. 2 and the upper portions thereof are provided with inclined edges 22. The lower front end wall 15 is curved, as shown, and terminates in an inclined flange 23. The rear wall of the box is provided with an opening 24 for receiving the journal of the car axle. The box, after it has been pressed in the improved machine, is completed by casting a top thereon. Figs. 2 and 3 illustrate the box after it has been formed in the improved machine. It is then necessary to machine the edges of the opening 24 and the edges of the upper front portion of the box which form the seat for the journal box lid. Fig. 4, as stated, shows a blank 25 from which the journal box is formed.

A female die block 26 is mounted in central position upon the lower head 2 of the die press. It is held in raised position above the face of the lower head by suitable standards or brackets 27. The opening 28 of the female die member 26, as most clearly shown in Fig. 8, conforms to the horizontal sectional outline of the journal box. The die

block or member 26 is provided with a transverse seat 29 which extends about the die opening and is adapted to receive the flat blank 25 from which the journal box is formed. The die member 26 is also provided with a part which extends over the seat 29 and is arranged to engage the edges of the blank. Preferably, this part which extends over the blank receiving seat comprises a separate plate 30 secured to the block or die member by bolts 31 and having an opening 32 therein above the die opening.

A male die 33 for cooperating with the female die block 26 is secured to the under face of the cross-head 11 by bolts 34 which extend through a flange 35 on the upper portion of the male die. The projecting face of the male die corresponds to the interior surface of the journal box. Its vertical side walls and the vertical side walls of the die block 26 are provided with cooperating vertical projections or ribs and recesses for forming the ribs and projections upon the side walls of the journal box. That is to say, the side walls of the die opening 28 are provided with vertical ribs 36 and the sides of the male die 33 are provided with cooperating vertical recesses 37 to thereby form the bolt receiving grooves 17 in the side walls 14 of the journal box. The side walls of the male die are also provided with vertical projections or ribs 38 and 39 and the side walls of the die block are provided with corresponding recesses 40 and 41 to thereby form the ribs 18 and 20 of the box.

The opening 32 in the plate 30 corresponds in outline to the horizontal sectional outline of the male die and is slightly larger than the same to give a slight clearance. The opening 28 in the female die block, except at its front edge, it still larger so that the thickness of metal forming the journal box can be properly received between its walls and those of the male die member. In this way, the portions of the plate 30 overlap to a slight extent the side and rear edges of the opening 28 in the die block 26. The side and back edges of the opening in the die block are also preferably rounded, as indicated at 42 and 43 in Figs. 6 and 7. It is not necessary to round the front edge of the die opening 28.

A supporting die 44 is adapted to extend within the lower portion of the opening of the die block 26. This supporting die is carried upon a suitable head 45 which in turn is fixed to the upper end of the plunger 6. The die block 44 is shaped to conform to the surface of the bottom of the journal box and is provided with transverse grooves 46 and 47 which cooperate with the pair of transverse ribs 48 and 49 upon the lower face of the male die to form the transverse ribs

19 and 21 on the bottom of the journal box. Except at its front end, the working faces of the supporting die extend in horizontal direction. At the front end, the die is provided with an upwardly projecting curved part 50 which cooperates with a correspondingly curved portion 51 on the lower front portion of the male die 33 to form the curved front wall 15 and its flange 23 at the lower front portion of the box. The supporting die 44 is also provided with a recess 52 and the male die is provided with a cooperating projection 53 which is adapted to form a projecting lug 54 upon the journal box. This lug serves as an abutment for engaging a jack. The side edges of the supporting die are square, as shown, but the edges between the bottom and side faces of the male die 33 are rounded, as indicated at 55 in Fig. 7.

In operation, the movable male and supporting dies 33 and 44 are raised and a blank is placed in position in the seat 29 of the female die block 26. This seat or slot preferably opens on one side of the block, so that the blank can be slid into position. The other edges of the seat form gages for properly positioning the blank. In the raised position of the supporting die, the head 45 contacts with the lower face of the die block 26 and the supporting die extends within the opening 28 of the female die with the projections 50 thereon extending upwardly to the plane of the seat 29. To properly position the supporting die 44, the block 26 is preferably provided with a series of depending guide rods 56 which extend through the flange of the head 45. The supporting die is held in raised position by fluid under pressure within the lower cylinder 5. With the parts in the position shown in Figs. 1 and 5, oil or water under pressure is admitted to the upper cylinder 4 to depress the cross-head 11 and upper die 33. The male die is then forced downwardly through the opening of the female die to press the central portion of the blank against the supporting die 44. During this initial shift of the male die, the supporting die is held stationary by the oil or water under pressure within the cylinder 5, so that this initial shift of the male die completes the formation of the lower portion of the journal box. When the blank is firmly pressed against the lower supporting die, the continued movement of the male die shifts the supporting die against the pressure of the oil or water in the cylinder 5. To permit this operation, the cylinder 5 may be smaller than the cylinder 4 or the pressure in the cylinder 5 may be somewhat lower than the pressure of the liquid supply to the upper cylinder. During this continued movement of the shiftable male and supporting dies, the lower formed portion

of the journal box is gripped between them and the formation of the side and back end walls of the journal box is completed between the vertical faces of the male and female dies. During the movement of the male die, the edges of the blank are arranged in the seat 29 against the surfaces of the die block 26 and plate 30. The engagement of the edges of the blank with these surfaces arrests, to some extent, the movement of the body of the blank as the male die is advanced. In this way, the metal of the blank is drawn smoothly to form around the curved edges 42 and 43 of the female die. The shift of the male die is sufficient, not only to completely form the journal box body, but also to project the same below the lower face of the die block 26. Then, by withdrawing the male die the completed box can be removed from the machine in lateral direction. The supporting die is then returned to the position shown in Figs. 1 and 5 for the succeeding operation.

It should be noted that during the initial movement of the male die, the supporting die, as stated, is held stationary and the bottom part of the box and the lower front end wall are completely formed and the side and back end walls are partially formed. The continued shift of the male and supporting dies, as described, completes the formation of the side and back end walls of the box, the entire box being formed by a single operation of the dies. To prevent the binding of excess metal between the front edges of the male and female dies, the front edge of the male die is provided with a recess, as clearly indicated at 57 in Figs. 5 and 6.

It is obvious that numerous changes may be made in the details set forth without departure from the essentials of the invention as defined in the claims.

I claim as my invention:—

1. In a die press for forming journal boxes and the like, the combination of a female die member having a seat about the opening therein for receiving a flat blank and provided with a part extending over said seat for engaging the edge portions of the blank, a supporting die movable through said female die, a cooperating male die, means for initially moving said male die through said female die to form the lower portion of the journal box against said supporting die and for thereafter moving said male and said supporting dies together to complete the formation of the walls of the box and means for holding said supporting die stationary during the initial movement of said male die, substantially as described.

2. In a die press for forming journal boxes and the like, the combination of a female die member having a seat about the opening therein for receiving a flat blank

and provided with a part extending over said seat for engaging the edge portions of the blank, a supporting die movable through said female die, a cooperating male die, and means for initially moving said male die through said female die to form the lower portions of the journal box and for thereafter shifting said movable dies together with the lower portion of the box gripped between them to complete the formation of the box and means for holding said supporting die stationary during the initial movement of said male die, substantially as described.

3. In a die press for forming journal boxes, the combination of a female die having an opening extending therethrough and provided with a transverse slot about said opening for receiving and engaging the edge portions of a flat blank, a supporting die movable through said opening, a cooperating male die, means for initially moving the latter through said opening to form the lower portion of the journal box against said supporting die, and for then shifting said movable dies together with the bottom of the box held between them to complete the formation of the box walls and pressure means for holding said supporting die stationary during the initial movement of said male die, substantially as described.

4. In a die press for forming journal boxes and the like, the combination of a female die member having a seat for receiving a flat blank and provided with a part extending over said seat for engaging the edge portions of the blank, the opening through said part being slightly smaller than said die opening, a supporting die movable through said die opening, a cooperating male die, means for initially moving said male die through said female die and against said supporting die to form the lower portion of the journal box and for then shifting said movable dies together with the bottom of the box gripped between them to complete the formation of the side and end walls of the box and pressure means for holding said supporting die against movement during the initial movement of said male die, substantially as described.

5. In a die press for forming journal boxes, the combination of a female die member having a substantially rectangular opening extending therethrough and conforming to the horizontal sectional outline of the journal box, a supporting die conforming to the lower surface of the box, a cooperating male die conforming to the interior of the box and arranged, during the initial part of its movement, to form the lower portion of the journal box against said supporting die, and upon its continued movement, to advance said supporting die and complete the

formation of the side and end walls against the working faces of said female die, means for shifting said male die and means for yieldingly holding said supporting die
5 against movement during the initial movement of said male die, substantially as described.

6. In a die press for forming journal boxes, the combination of a female die having a substantially rectangular opening extending therethrough and conforming to the horizontal sectional outline of the journal box, a supporting die conforming to the lower surface of the box, and having a
10 projecting portion conforming to the lower front end wall of the box, a cooperating male die conforming to the interior of the box, and means for initially shifting said male die relatively to said female
15 and said supporting die, to form the lower portion of the box within said female die and against said supporting die, and for subsequently shifting said male and said supporting dies relatively to said female die to form the side and back end
20 walls of the box between the working faces of said male and female dies, substantially as described.

7. In a die press for forming journal boxes, the combination of a female die having a substantially rectangular opening extending therethrough and having vertical walls conforming in outline to the horizontal sectional outline of the journal box, a
30 vertically movable male die conforming to the interior of the box, said dies having cooperating, vertically disposed projections and recesses for forming ribs and grooves in the side walls of the box, a supporting
35 die, means for initially moving said male die

through said female die to form the lower portion of the journal box against said supporting die and then advance the latter and complete the formation of the walls of the box against the working faces of said female die and means for yieldingly holding
45 said supporting die in position in said female die during the initial movement of said male die, substantially as described.

8. In a die press for forming journal boxes, the combination of a female die having a substantially rectangular opening extending therethrough and having vertical walls conforming in outline to the horizontal sectional outline of the journal box, a
50 vertically movable male die conforming to the interior of the box, said dies having cooperating, vertically disposed projections and recesses for forming ribs and grooves in the side walls of the box, a supporting die
55 yieldingly held in position in said female die, and having a projection at one end conforming to the front end wall of the box, said female die having a transverse seat extending about the opening therein and a
60 holding plate extending over said seat and arranged to engage the edge portions of the blank, and means for moving said male die through said female die to first form the lower portion of the journal box against said
65 supporting die and then shift the latter and complete the formation of the side and back end walls of the box against the working faces of said female die, substantially as described.

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