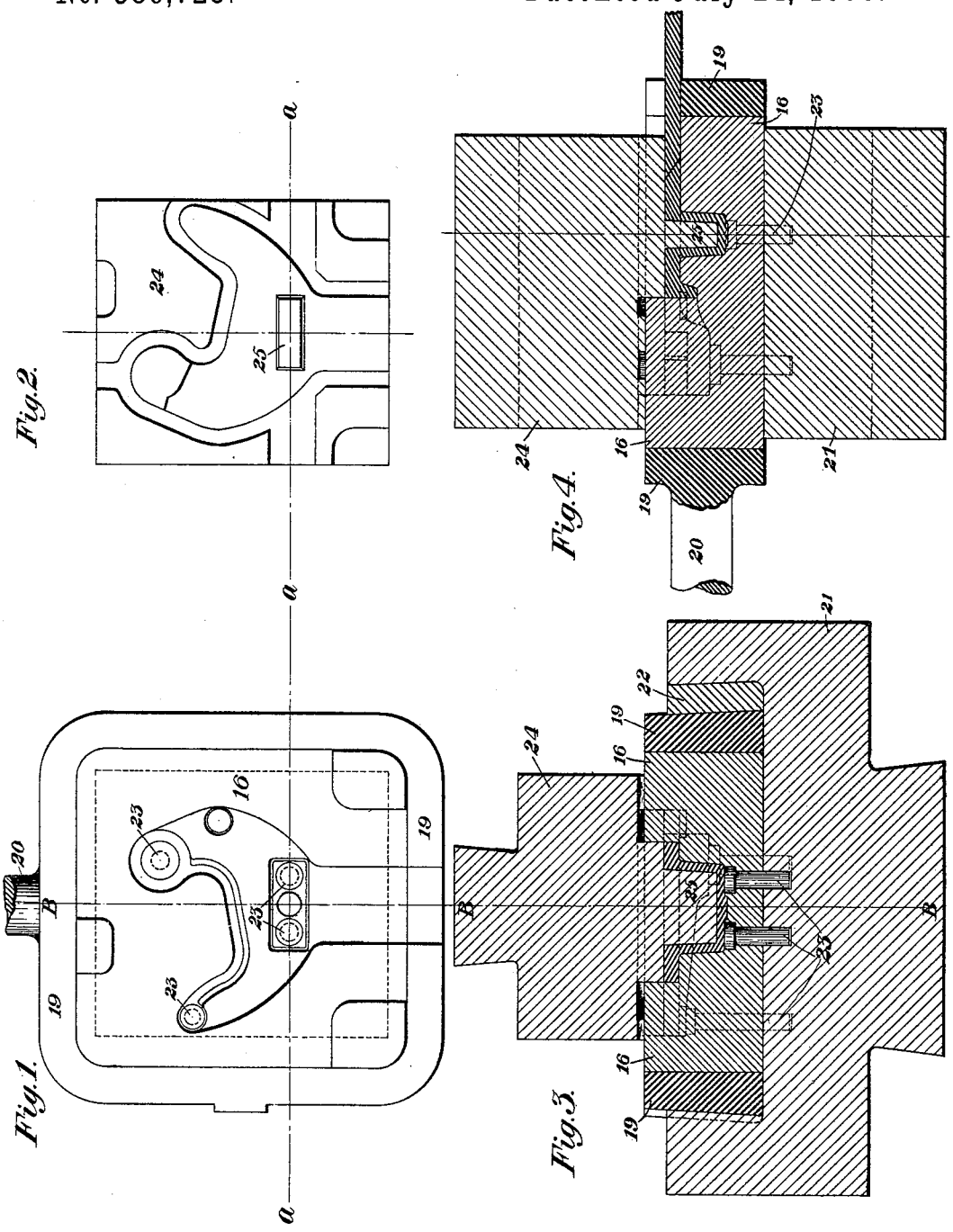
(No Model.) 4 Sheets—Sheet 1.

J. H. SIMPSON.

MANUFACTURE OF COUPLERS.

No. 386,725. Patented July 24, 1888.



WITNESSES.

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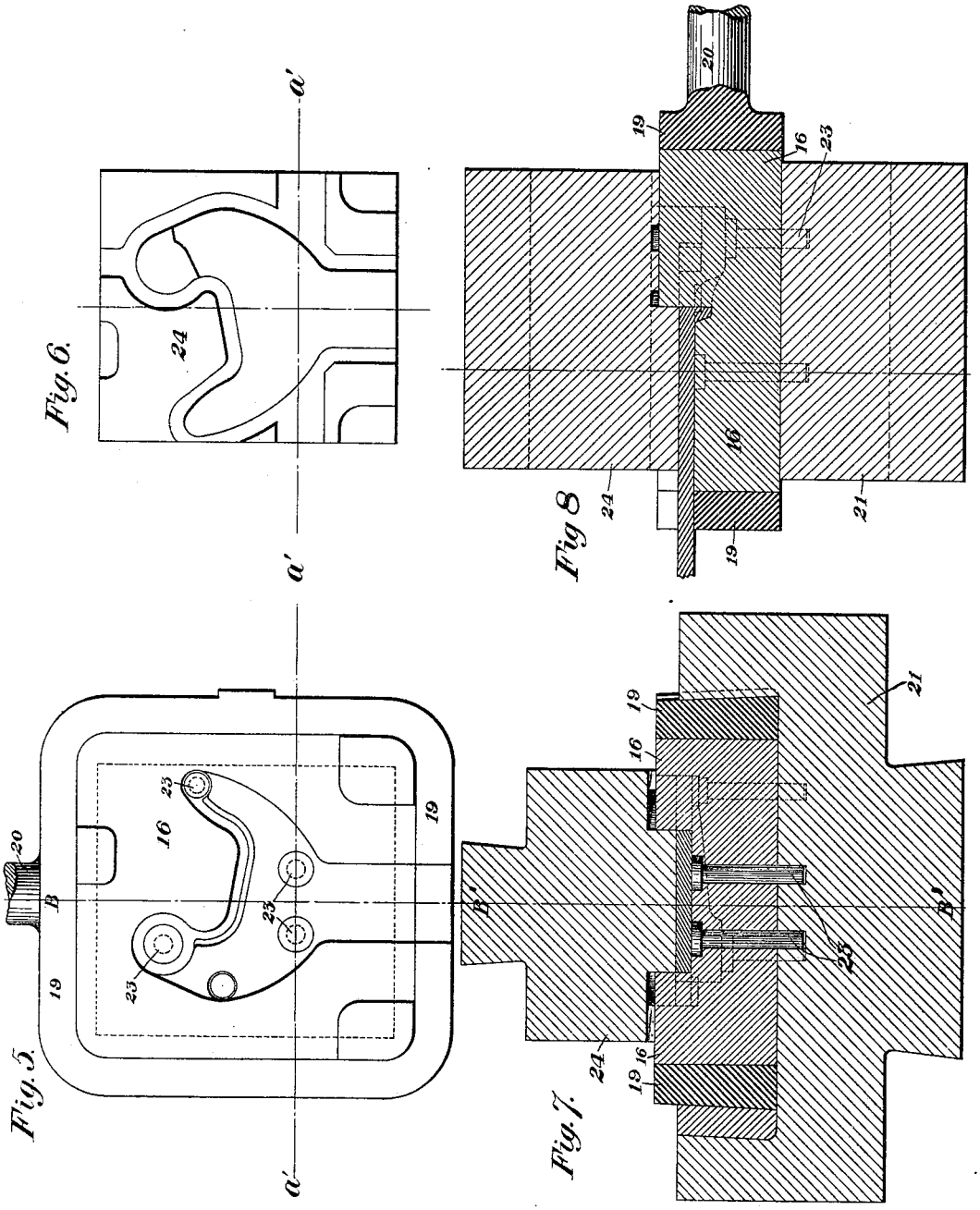

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MANUFACTURE OF COUPLERS.

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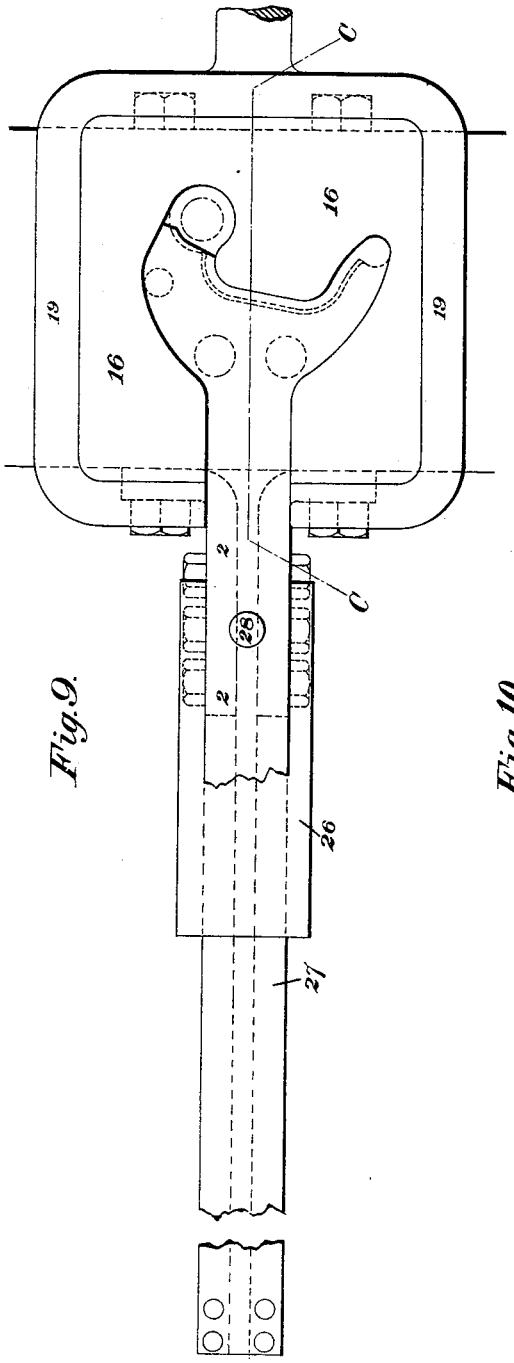

Fig. 9.

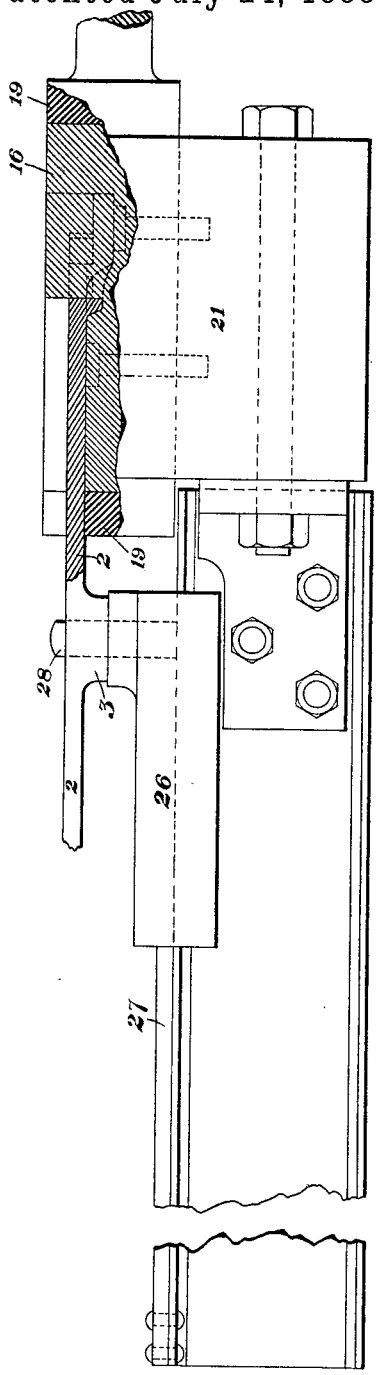

Fig. 10.

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MANUFACTURE OF COUPLERS.

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Fig. 11.

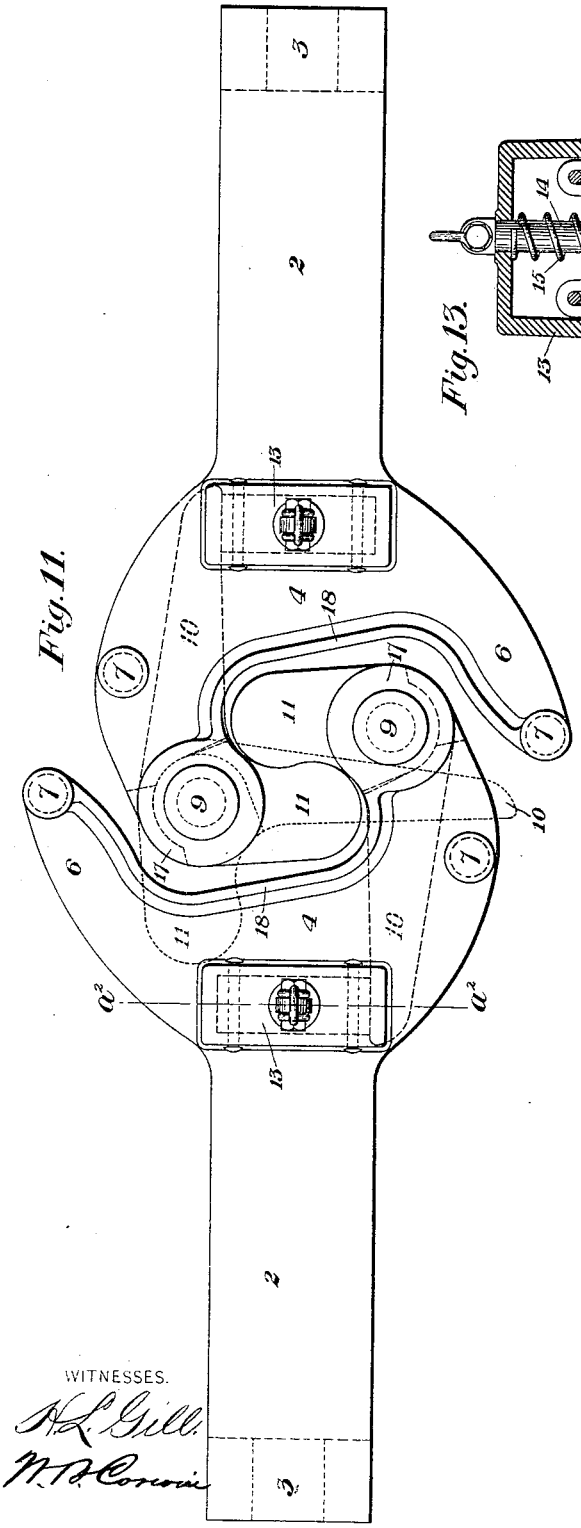


Fig. 13.

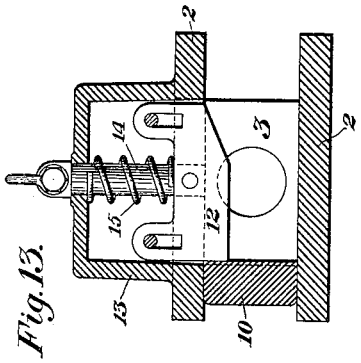
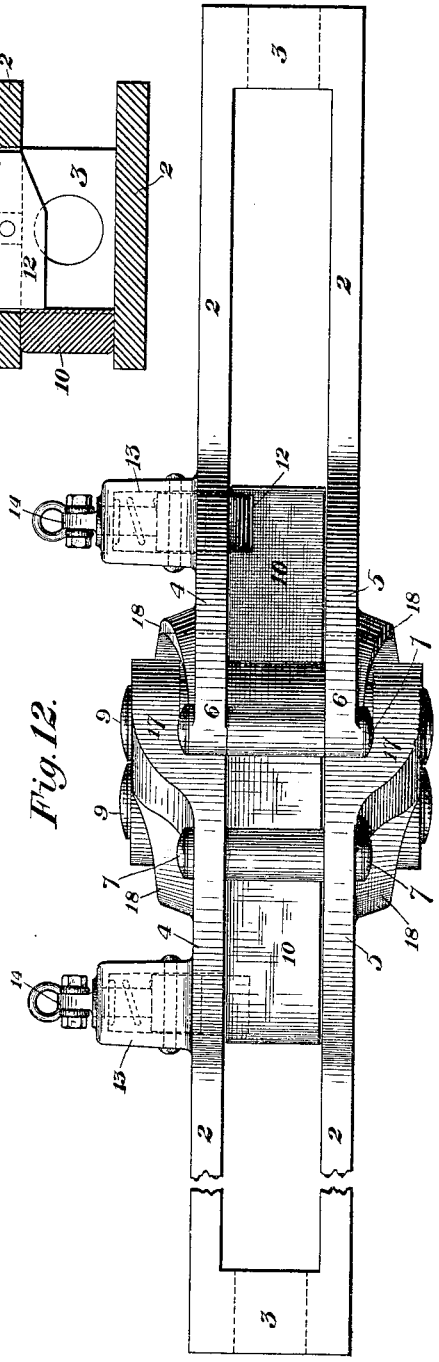


Fig. 12.



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UNITED STATES PATENT OFFICE.

JAMES H. SIMPSON, OF PITTSBURG, PENNSYLVANIA, ASSIGNOR TO CARNEGIE, PHIPPS & CO., (LIMITED,) OF SAME PLACE.

MANUFACTURE OF COUPLERS.

SPECIFICATION forming part of Letters Patent No. 386,725, dated July 24, 1888.

Application filed April 7, 1888. Serial No. 269,946. (No model.)

To all whom it may concern:

Be it known that I, JAMES H. SIMPSON, of Pittsburg, in the county of Allegheny and State of Pennsylvania, have invented a new and useful Improvement in the Manufacture of Couplers; and I do hereby declare the following to be a full, clear, and exact description thereof, reference being had to the accompanying drawings, forming part of this specification, in which—

Figure 1 is a plan view of one of the bottom dies which I use in the manufacture of the coupler. Fig. 2 is a bottom plan view of the upper die. Fig. 3 is a vertical cross-section on the line *a a* of Fig. 1, showing the bottom and top die in conjunction. Fig. 4 is a vertical cross-section on the line B B of Fig. 3. Fig. 5 is a plan view of the other bottom die which I employ. Fig. 6 is a bottom plan view of the top die, which works in conjunction with the bottom die of Fig. 5. Fig. 7 is a vertical cross-section on the line *a' a'* of Fig. 5, showing the top die, also in vertical section, in connection with the bottom die. Fig. 8 is a vertical cross-section on the line B' B' of Fig. 7. Fig. 9 is a plan view of one of the bottom dies, shown in connection with the holder and gage which I employ for adjusting the length of the coupler-bar. Fig. 10 is a side elevation, shown partly in section on the line C C of Fig. 9. Fig. 11 is a plan view of the automatic coupler for the manufacture of which I have designed the dies. Fig. 12 is a side view thereof. Fig. 13 is a vertical cross-section on the line *a² a²* of Fig. 11.

Like symbols of reference indicate like parts in each.

I shall first describe the construction of the couplers which I make in my improved dies, referring especially to Figs. 11, 12, and 13 of the drawings. The two couplers which are shown in Figs. 11 and 12 are identical in construction. Each has a shank composed of two side bars, 2, united at the end by a solid or integral heel-piece, 3, through which is made a hole for the draft-pole, whereby the coupler is fastened to the car. The side bars, 2, are parallel, and are somewhat separated, as shown in Fig. 12, and at their ends they are provided with enlarged heads 4 5, of the shape shown in Fig. 11, the heads being forked or provided with projections 6. The heads of the two side bars are united by welding or by rivets 7. Each coupler has a tongue pivoted on a pin, 9, between the separated heads of the coupler, and constructed in angular shape—that is, with a long locking-arm, 10, and a shorter arm, 11. When the opposite couplers of two cars come together, they are coupled by engagement of the short parts 11 of the tongues, as shown in Fig. 11, and when they are thus coupled the longer arms, 10, of the tongues extend back in line with the shanks of the couplers. They are held automatically in this position by means of latches 12, which are arranged to slide vertically in boxes 13, made on the upper parts of the coupler-heads. These latches are provided with stems 14, which project upwardly through the box, and are provided with springs 15, which tend to force them downward. The under side of the forward end of each latch is beveled, as shown in Fig. 13, and when the long arm of the coupler-tongue is swung back by the act of coupling the car it engages and automatically forces up the latch 12 until it has passed this latch and come into the position shown in Fig. 13, when the latch springs down, and by preventing the return of the tongue keeps the cars coupled. The cars are uncoupled by raising the stem 14 in either coupler-head, and thus allowing the coupling-tongues to swing back, as shown by dotted lines in Fig. 11.

The form of coupler which I have just described is one of great utility. Hitherto couplers of this class have been made of cast-iron, no adequate means or method having been known for making them of wrought-iron. They have therefore been objectionable on many accounts, and have not possessed the compactness of structure and the strength which appertain to the coupler as made by me of wrought-iron or steel.

In making the couplers which I have described it is necessary to employ two sets of dies—one set for making the upper part of the coupler-head, which is provided with the spring-latch box 13, and the other set for making the other part of the head, which is flat and has not this box. I shall first describe

the dies used for making the head 4, on which is the box. The bottom die, 16, is made with recesses which are the counterparts in shape of the parts of the coupler-head. Thus the die has a recess of the shape of the box 13, another recess of the shape of the enlargement 17, which is formed on the head around the pivot-pin 9, and a recess of the shape of a strengthening-rib, 18, which extends along the front edge of the coupler-head. The general outline of the cavity of the die is of the same form as the coupler-head which is shaped therein. The die is surrounded by a band, 19, to which is fixed a porter-bar, 20, by means of which the die may be moved from place to place. The die with its inclosing-band is set in a cavity in an anvil-block, 21, and is held therein by a key, 22. In the cavity of the die, just below the recesses for the formation of the box 13 and the enlargement 17, are holes which extend through the body of the die. Pins 23 are fitted in these holes, so that normally their heads shall be flush with the bottoms of the recesses in the die-cavity, while their lower ends shall project below the bottom of the die into recesses provided for them in the anvil-block 21. The top die, 24, is adapted to be fixed to the end of a reciprocating plunger or hammer, and its bottom face is made the counterpart of the under side of the upper head, 4, of the coupler. It has a tongue, 25, adapted to work within the corresponding recess in the bottom die to form the interior of the box 13, and a cavity which extends around the die for receiving the surplus stock during the forging operation, and thus saving the die from being bruised.

The operation of these dies is as follows: A blank of wrought-iron or steel is forged or stamped into approximately the shape of the coupler-head. Then I lay pieces of wrought-iron or steel on the surface of the blank in places, so as to make up for the difference in stock required for the box, the projection 17, and the flange 18. These, being then heated to a welding heat, are placed in the cavity of the bottom die, 16, and a wrought-iron strap made of nearly twice the length of the shank of the coupler, and provided at the middle with an enlargement which ultimately forms the heel-piece 3, is scarfed at the ends to correspond with a scarf formed on the end of the head-blank, and, having been heated to a welding heat, is set in the bottom die so that it shall project through a slot made in the band 19 and that its scarfed end shall overlap or rest upon the scarfed end of the head-blank. The upper die is then caused to reciprocate and to strike upon the metal in the lower die, and the effect of this is to forge out a coupler-head into the desired shape, forming the box 13, the enlargement 17, and the strengthening-rib 18, and simultaneously welding the head onto the strap of the shank. The action of the moving die forces the pieces of wrought-iron or steel which are on top of the blank down through the blank into the cavities of the lower die, thus forming the desired projections on the coupler-head and causing a perfect weld or union with these added parts. When this operation is finished, the top die being raised out of the cavity of the lower die, the coupler-head may be ejected from the lower die by raising this die by means of the porter-bar, thus lifting the projecting ends of the pins 23 out of their recesses in the anvil-block 21 and causing them to rest upon its surface. The weight of the bottom die, then acting on these pins, presses them upward and causes them to eject the finished coupler-head from the cavity of the die without in any way disturbing the shape of the article. If this weight is not sufficient, I place blocks on the sides of the bottom die, and by causing the moving die to press thereon the forging is easily forced out. In order now to form the other part of the head, which is not provided with the box 13, I employ the dies shown in Figs. 5, 6, 7, and 8, which are identical in all respects with the dies which I have just described, except that they are not provided with recesses and tongues adapted to the formation of a box 13.

In practice I first form and weld a number of head-blanks on the ends of strap-blanks by means of the dies shown in Figs. 2, 3, and 4, and then, having removed these dies from the anvil-block and hammer, I set in place the other dies of Figs. 5, 6, 7, and 8, and by their means I form heads on the other end of the strap-blanks. In order to insure exact uniformity in the positions of the heads, I employ in connection with the dies the device shown in Figs. 9 and 10. This consists of a holder, 26, arranged to slide on a bed-piece, 27, and provided with a pin, 28, which fits through the hole in the enlargement 3 at the middle of the strap-blank. The strap-blanks are adjusted on this pin when they are set in the dies, and they are thus held in place and uniformity in the product of the dies is obtained. The bed-piece 27 is bolted to the anvil-block, and the holder or gage is movable back and forth thereon, and is held in the desired position by suitable keys and gibs. Having thus formed the blank with heads at both ends, as I have described, I heat the middle part of the strap-blank and bend the side bars, 2, up into position parallel with each other. The rivet-holes are then drilled, the heads of the coupler are united by means of the rivets 7 or by welding, the tongue is set in place, and its pin 9 is adjusted. The coupler-head is then completed and ready for the adjustment of the latch 12, its stem 14, and actuating-spring 15. By use of the method and apparatus which I have indicated I am enabled to make couplers of this form very rapidly at minimum labor and cost and to produce a much better and stronger article than has heretofore been possible. The advantages of my invention in this regard will be appreciated by those skilled in the art.

I do not desire to limit myself strictly to the

precise forms of my invention which I have illustrated and described, since it is susceptible of some mechanical modifications.

I do not claim herein the method hereinbefore described, since I have made it the subject of a separate application, Serial No. 271,974, filed April 28, 1888.

I claim herein as my invention—

1. As an improvement in dies for the manufacture of coupler-heads, a bottom die having its cavity shaped to be the counterpart of the coupler-head, and a recess in the die for the reception of the strap of the coupler which is placed therein on the coupler-head, said recess extending to the outside of the die, substantially as and for the purposes described.

2. As an improvement in dies for the manufacture of coupler-heads, a bottom die having a cavity shaped to be the counterpart of the coupler-head, and a recess in the die adapted to form a box on the coupler-head, in combination with a moving die which operates upon the metal in the cavity of the lower die to forge it into shape, and which is provided with a tongue adapted to enter the box-recess, substantially as and for the purposes described.

3. As an improvement in dies, a bed-die having a cavity shaped to be the counterpart of the article to be forged therein, and a pin or pins arranged in the bottom of the die with their heads bearing against the article and their ends projecting from the die, substantially as and for the purposes described.

4. As an improvement in dies for the manufacture of coupler-heads, a bottom die for shaping the coupler-head and welding the strap thereto and a movable holder or gage for the strap-blank, said holder or gage being movable and adjustable to and from the die, substantially as and for the purposes described.

5. As an improvement in dies for the manufacture of coupler-heads, a bottom die for shaping the coupler-head and welding the strap thereto and a movable holder or gage for the strap-blank, having a pin which fits through a hole in the strap blank, substantially as and for the purposes described.

In testimony whereof I have hereunto set my hand this 31st day of March, A. D. 1888.

JAMES H. SIMPSON.

Witnesses:
W. B. CORWIN,
J. K. SMITH.