2 Sheets—Sheet 1.

J. A. HODEL.

Apparatus for Forming Valve-Yokes.

No. 208,600. **Patented Oct. 1, 1878.**

Fig. 1.

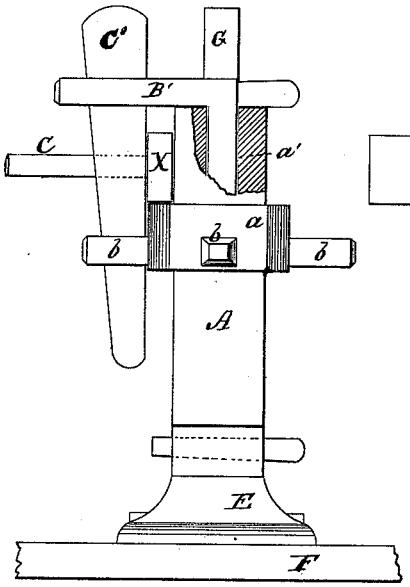


Fig. 2.

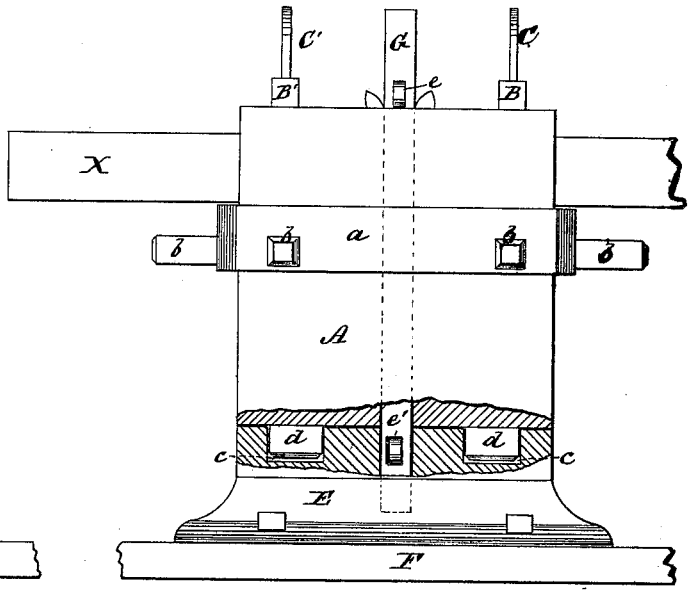
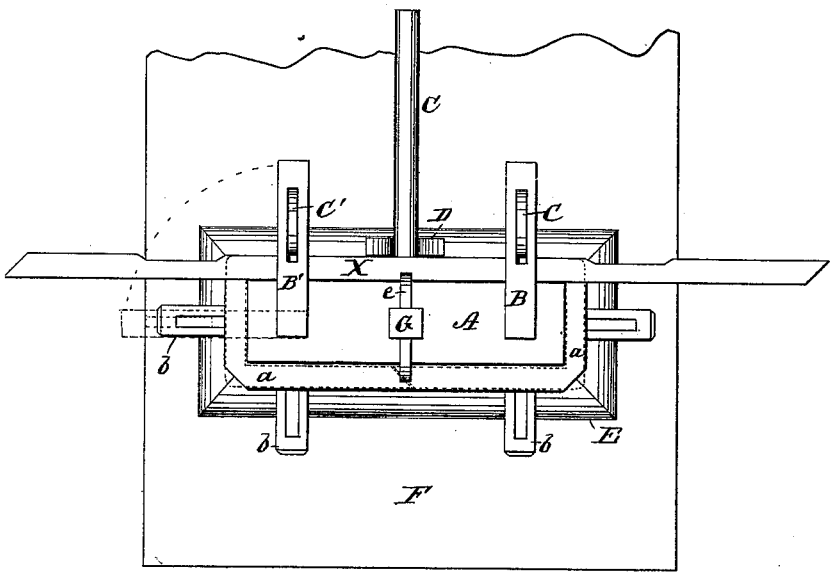


Fig. 3.



WITNESSES:

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Solon C. Kemon

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2 Sheets—Sheet 2.

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Apparatus for Forming Valve-Yokes.

No. 208,600. **Patented Oct. 1, 1878.**

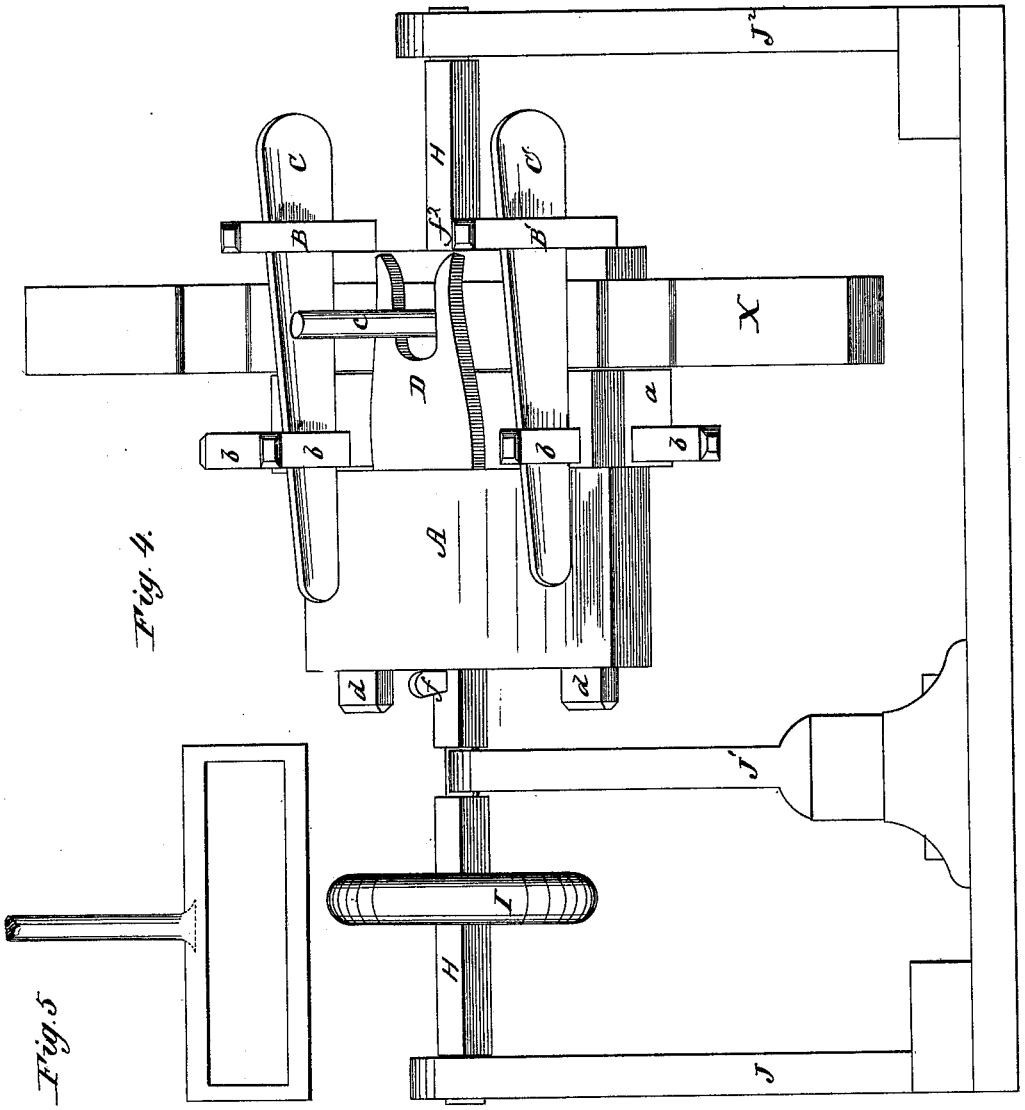

Fig. 4.

Fig. 5.

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UNITED STATES PATENT OFFICE.

JOSEPH A. HODEL, OF CUMBERLAND, MARYLAND.

IMPROVEMENT IN APPARATUS FOR FORMING VALVE-YOKES.

Specification forming part of Letters Patent No. **208,600**, dated October 1, 1878; application filed August 26, 1878.

To all whom it may concern:

Be it known that I, JOSEPH A. HODEL, of Cumberland, in the county of Alleghany and State of Maryland, have invented a new and Improved Device for Forming Valve-Yokes for Steam-Engines; and I do hereby declare that the following is a full, clear, and exact description of the same, reference being had to the accompanying drawings, forming part of this specification, in which—

Figure 1 is an end elevation, partly broken away; Fig. 2, a side elevation, partly broken away; Fig. 3, a plan view. Fig. 4 is a view of the device when mounted upon a horizontal axis. Fig. 5 is a detail of a valve-yoke.

The object of my invention is to provide a device for forming valve-yokes for steam-engines. These valve-yokes are in the nature of rectangular iron frames, which fit over the top of the slide-valve of a steam-engine, and are provided with an offsetting-stem, which connects with the eccentric-rod, the said yokes serving to transmit a reciprocating motion to the valve.

In manufacturing these yokes heretofore the weight of the device had to be sustained by the workman while manipulating the same into its perfect form, and as the valve-yoke of the locomotive-engine ordinarily used weighs about eighty pounds, the operations of forging and welding involved much hard labor. As the yokes have to be formed also by hand and without any definite guide, but little accuracy could be obtained, and the labor of dressing them down and truing them up was also great.

My invention consists in the construction and arrangement of a device for forming these yokes accurately and without the laborious handling of the same, as hereinafter more fully described.

In the drawings, A represents a heavy rectangular casting, conforming in cross-section to the interior area of a complete yoke. (Shown in Fig. 5.) Upon all four sides of this body portion A there projects an offsetting ledge or shoulder, *a*, and extending at right angles from this ledge upon all four sides are keepers *b*, or lugs having closed slots. In the upper end of the body portion are formed square holes *a'*, Fig. 1, in which are detachably arranged the vertical stems of the right-angular arms B B', the horizontal portions of which arms are provided with elongated holes or slots, which slots, for the several adjustments of the arms hereinafter described, are in vertical line with the holes of the projecting keepers *b*, so that the keys C C' may pass through both.

Now, in bending and forming the yoke, the blank *x*, which is made T-shaped, as shown in Fig. 3, is placed upon the ledge or shoulder *a*, with the stem *c* projecting through a fork, D, which extends upwardly from one side of the shoulder *a*. This fork serves to center the stem with respect to the yoke that is to be formed, and also holds the yoke portion of the blank on the shoulder, with the recessed portions of the blank in proper relation to the corners of the casting A, about which the yoke is to be formed. After the blank is placed upon the shoulder, with the stem projecting through the fork, the keys C C' are inserted through the slots in the right-angular arms B B', and the slots in the keepers *b* below. A series of blows are now delivered upon the projecting end of the blank, and said end is bent thereby around one corner at right angles. The key C' is then withdrawn and the right-angular arm removed from its socket, and, after being turned a quarter of a revolution, is readjusted to its socket, so as to project endwise from the casting A, in line with the end keeper, *b*. (See Fig. 3.) The key C' is then inserted in the slotted arm and the keeper, as before, to hold the first bend, as shown in dotted lines, while the end of said dotted portion is bent around parallel with the first section. This end is then secured by a further adjustment of the arm B' a quarter-revolution, after which the other end of the blank is served in the same way. After the two ends of the blank have been bent around into close proximity near the middle, the partially-formed yoke is removed from the former, and the ends are connected together by welding upon an anvil, after which the yoke is replaced upon the former, and is trued up ready to be dressed by the planer.

This method of manufacturing the yoke requires but one weld, and is not only much more economical, but makes a stronger and

better yoke than that manufactured by the old method, in which the yoke is made in two pieces and two welds are required.

For making yokes of larger or smaller size the casting A may be so constructed as to receive one or more "liners" or exterior bushings, which are slipped over the former, and are removed or applied, according as it is desired to increase or diminish the size of the former.

During the operation of bending the yoke about the former the latter may be arranged either in an upright stationary position, as in Figs. 1, 2, 3, in which the workman passes around it as the blank is bent, or it may be disposed in a horizontal position and arranged to revolve, as in Fig. 4, so that the workman remains upon one side and turns the former upon its axis as the bending progresses. For arranging it in a vertical position a pedestal, E, is bolted or pinned to a base, F, which pedestal has two mortises or recesses, *e*, which receive tenons *d*, Figs. 2 and 4, upon the bottom of the casting A, and hold the casting true upon the pedestal. Now, in securing the casting firmly a vertical tie-bar, G, extends through a longitudinal hole in the casting and enters a recess in the pedestal, which tie-bar is slotted at its end to receive keys *e e'*, one of which is driven through the tie-bar at the top of the former, and the other of which is driven through a lateral slot in the pedestal, and then through the slot at the lower end of the tie-bar to hold the casting firmly to the pedestal, as shown in Figs. 1 and 2.

To arrange the former upon a horizontal axis the keys *e e'* are removed and the tie-bar G taken out. A removable shaft, H, with hand-wheel I, is then inserted through the longitudinal hole in the casting, and held in place by wedges *f f'*. Detachable posts J J^1 J^2, with bearings for the shaft, are then arranged in seats on the base, and the shaft H, with the former, inserted in said bearings, in which position the former may be turned around to the workman by the hand-wheel, and the blank is brought in such relation to the workman that the blows can be delivered vertically and to much greater advantage.

Having thus described my invention, what I claim as new is—

1. The casting A, having offsetting-ledge *a*, extending around the same, right-angular and slotted lugs *b*, and sockets *a'*, in combination with one or more removable slotted and right-angular arms, B B', and keys C C', substantially as and for the purpose described.

2. The former herein described, having the fork D, for the purpose of centering the stem upon the yoke, as set forth.

3. The casting A, having a longitudinal hole through the same, in combination with a removable bar, secured by keys, and a suitable support, for the purpose of securing the device in either vertical or horizontal position, as described.

JOSEPH A. HODEL.

Witnesses:
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