3 Sheets—Sheet 1.

J. KRITCH.

MACHINE FOR FORMING COLLARS ON CARRIAGE AXLES.

No. 170,744. Patented Dec. 7, 1875.

FIG. 1.

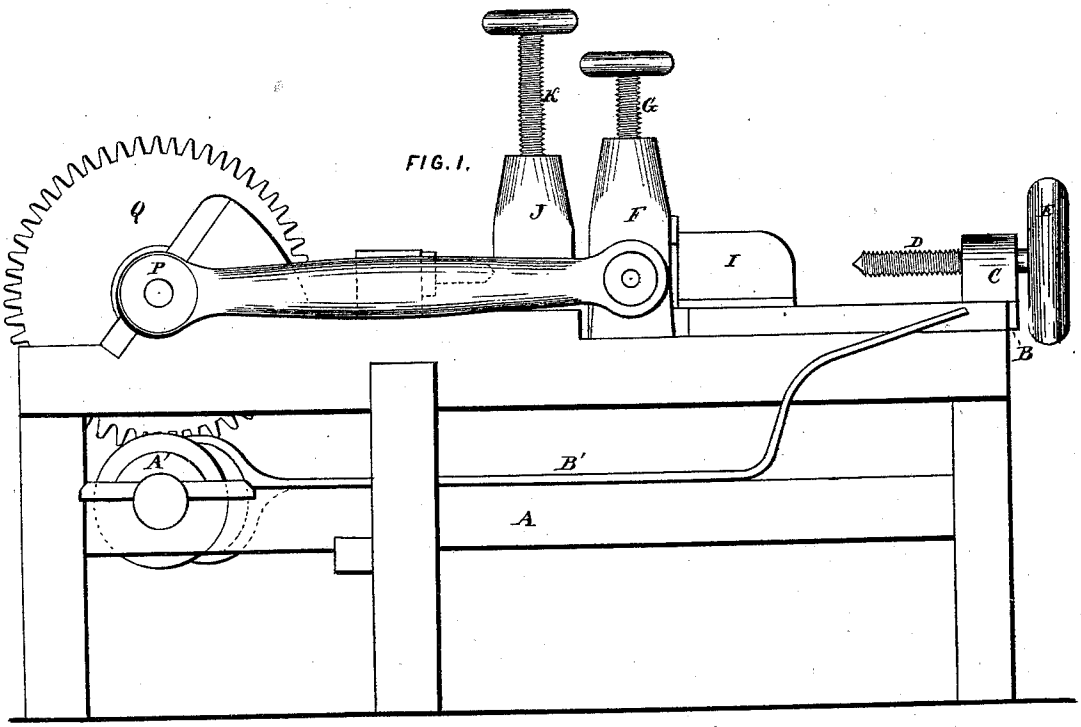

FIG. 2.

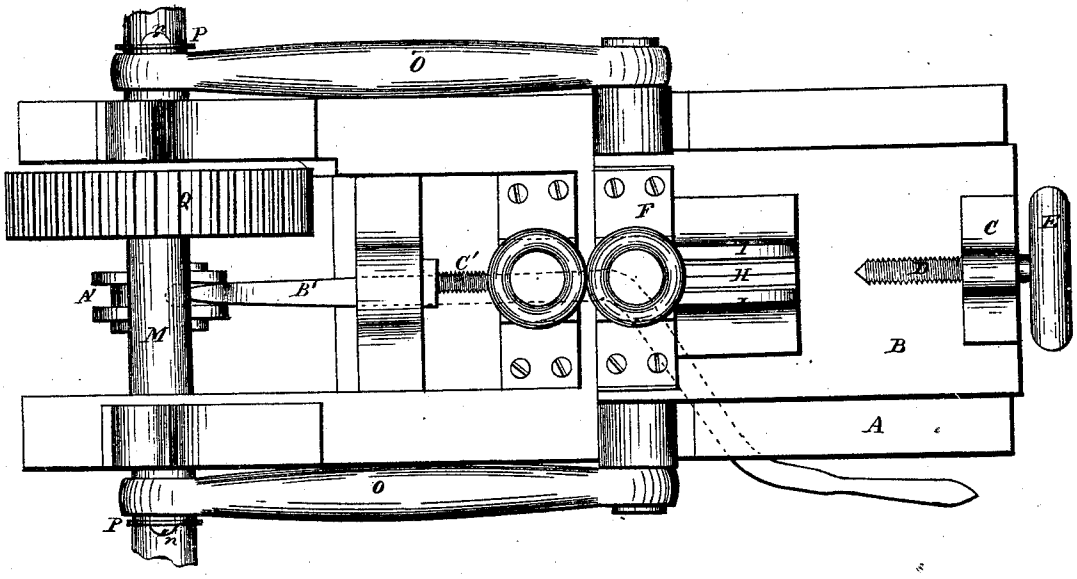

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FIG. 3.

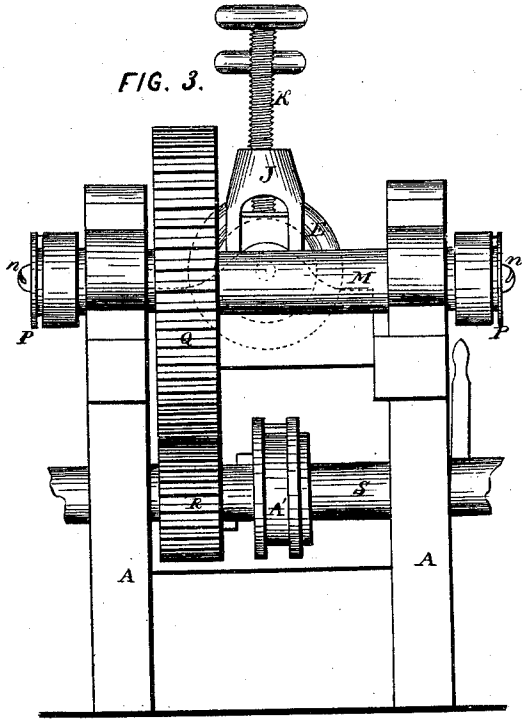


FIG. 4.

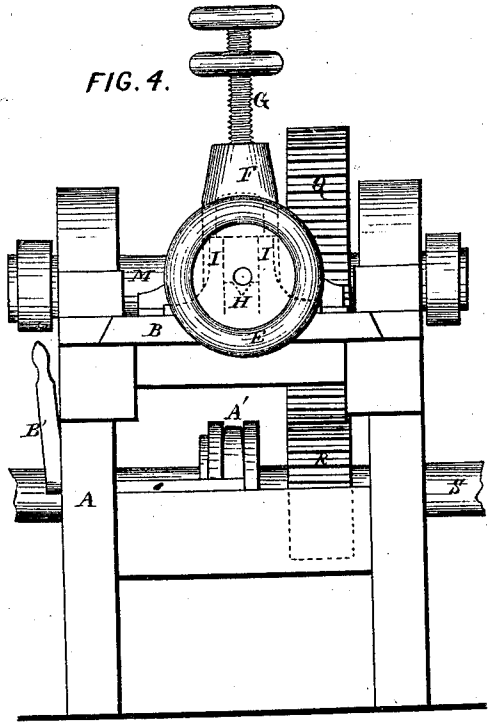
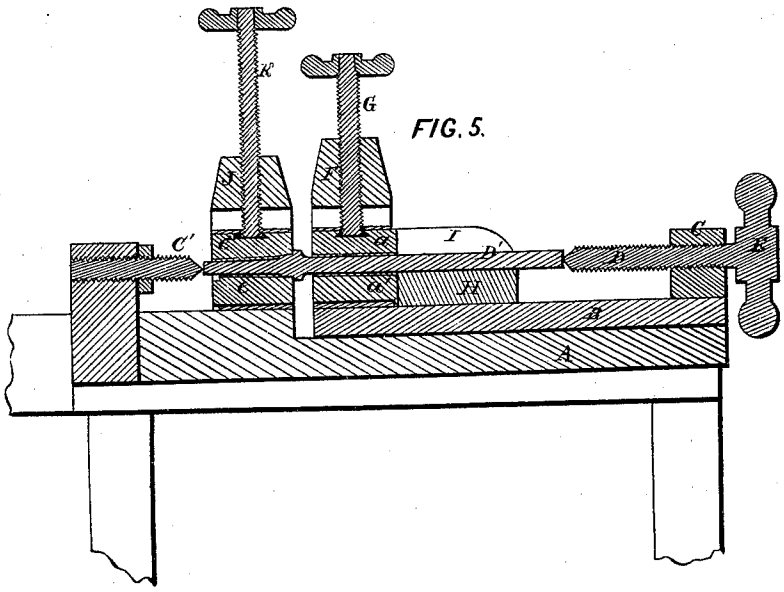


FIG. 5.



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3 Sheets—Sheet 3.

J. KRITCH.

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FIG. 6.

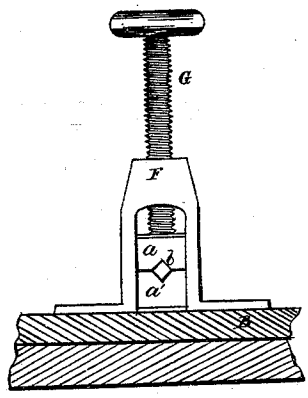


FIG. 7.

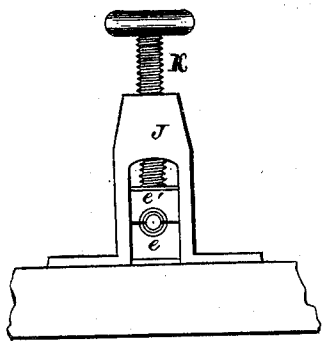


FIG. 8.

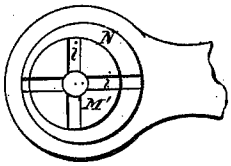


FIG. 9.

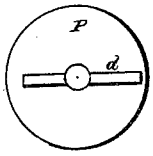


FIG. 10.

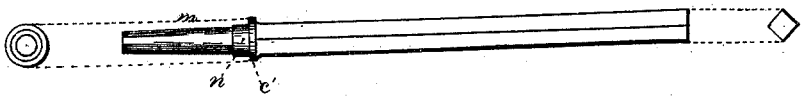
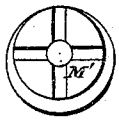


FIG. 11.



WITNESSES.

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UNITED STATES PATENT OFFICE.

JACOB KRITCH, OF CLEVELAND, OHIO.

IMPROVEMENT IN MACHINES FOR FORMING COLLARS ON CARRIAGE-AXLES.

Specification forming part of Letters Patent No. **170,744**, dated December 7, 1875; application filed March 4, 1875.

To all whom it may concern:

Be it known that I, JACOB KRITCH, of Cleveland, in the county of Cuyahoga and State of Ohio, have invented a certain new and Improved Machine for Upsetting Axle-Collars; and I do hereby declare that the following is a full, clear, and complete description thereof, reference being had to the accompanying drawings, making part of the same.

Figure 1 is a side elevation of the machine. Fig. 2 is a plan view. Figs. 3 and 4 are end elevations. Fig. 5 is a vertical longitudinal section. Figs. 6, 7, 8, 9, and 11 are detached sections. Fig. 10 is a view of the axle.

Like letters of reference refer to like parts in the several views.

The nature of this invention relates to a machine for upsetting carriage-axles; and the special object thereof is to form the shoulder of the axle in a die, and the collar between the dies, by upsetting the bar of which the axle is made, the bar being centered and pivoted in a central line between guides upon adjusting-screws. One of said screws is moved forward with the carriage, to which it is attached, and the bar is upset, thereby forming the collar and shoulder, during which operation the bar is prevented from deflection by the guides referred to, through which the bar passes into the die, all of which is more fully described as follows:

In the drawing, A represents a frame, in one end of which is fitted a carriage, B, Figs. 2 and 4. On the outer end of the carriage is a nut, C, in which is fitted a screw, D, provided with a hand-wheel, E. On the opposite end of the carriage is secured a guide-standard, F, wherein is fitted a pair of guide-blocks, *a a'*, Fig. 6. The lower block *a'* is stationary, whereas the upper one is movable by means of the adjusting-screw G, to which the block is attached. In the face of each of the blocks is cut a right-angled groove, so that, when the faces of the blocks are brought together, the two grooves form a square hole, *b*, as shown in Fig. 6, corresponding in shape to a square bar, of which an axle is made. Directly in front of a guide-standard is a grooved block, H. The groove corresponds in size and shape to the groove in the block *a'* referred to, and with which it is placed in a corresponding relation. Each side of the block H is covered by a shoulder or plate, I, Figs. 2 and 5, also indicated by the dotted lines in Fig. 4. Immediately back of the guide-standard F referred to is a similar guide-standard, J, Fig. 3, fixed rigidly to the top of the frame. In said guide-standard is a pair of dies, *e e'*. The die *e* is a fixture, whereas the die *e'* is movable by means of the adjusting-screw K, to which the die is attached. The print or form in the face of each of the dies is of the shape of an axle arm and collar, and which, when the two dies are placed together, form a mold, wherein is received the axle when being upset, as will be seen in Fig. 5, which represents vertical sections of the two dies placed face to face, and having in them an axle, D', in place. The carriage above referred to is moved reciprocally in the frame by the following devices:

The center of the circumference of each end of the shaft M, Fig. 2, is eccentric to the axial line of the shaft, thereby in effect producing an eccentric, M', on each end of the shaft, as will be seen in Fig. 11, which represents an end view of the shaft. On the eccentric ends of the shaft is fitted loosely a ring, N, Fig. 8, the center of the inner periphery of which is eccentric to the center of the outside of the ring, thereby making an eccentric ring, to which is fitted one end of the pitman O, whereas the opposite end of the pitman is attached to the carriage B above referred to. The ring is secured to the shaft, so that it may revolve therewith for operating the pitman and carriage, by a washer, P, a detached view of which is shown in Fig. 9, which represents the inner side of the washer, on which is formed a rib, *d*, of a size to fit snugly the groove *i*, Fig. 8, cut across the end of the shaft M', and in the side of the eccentric ring. When the groove or notch in the eccentric ring is in line with the groove in the shaft, as shown in Fig. 8, the washer is then put on, so that the rib *d* will be received into the groove of the shaft and ring; a screw, *n*, is then screwed into the end of the shaft, thereby holding the washer in its connection with the shaft and ring. It will be obvious that in thus connecting the eccentric ring with the shaft the ring must revolve therewith, and

operate the pitman, which, in turn, will operate the carriage reciprocally in the frame. Motion is given to the shaft M by the cog-wheel Q, made to engage a pinion, R, on the power-shaft S, Fig. 3. Said pinion is loosely fitted to the shaft, but is made to revolve therewith by a shifting-clutch, A′, secured to the shaft by a feather, and which is operated for clutching the pinion by the lever B′ in the ordinary way.

Having described the construction and arrangement of the machine, the practical operation of the same is as follows: A bar of iron (termed an axle-blank) of a proper length for an axle is taken, and one end thereof is rounded and tapered for the arm or spindle, as seen at *m*, Fig. 10. The shoulder *n′* and the collar *c′* are next formed by heating the blank at the place whereon the shoulder and collar are to be raised. The arm or spindle end of the blank is passed through the blocks *a a′*, and inserted in the dies *e e′*. The end of the blank is made to abut against the end of the adjusting-screw C′, whereas the opposite end engages the end of the adjusting-screw D. The bar or blank thus held between the two screws lies along in the pillow or block H, between the sides I, in which position of the bar the block *a* in the guide-standard F is screwed down close upon it, but not tight, so as to hold it fast. The position of the bar, when thus secured in the machine, is shown in Fig. 5, in which D′ indicates the bar or axle-blank. The heated part of the bar, which is that between the two guide-standards J F, is now upset by the movement of the carriage, which is drawn forward by the pitmen and eccentrics above described. The pressure upon the bar is at the end engaged by the screw D, and which is resisted by the screw C′, which, together with the guide-standard J, are stationary. As the metal upsets it fills the larger section of the dies *e e′*, thereby forming the shoulder of the axle in the dies and the collar between the guide-standards J and F. While the bar is being upset for the shoulder and collar, it is prevented from deflection (caused by the end pressure exerted upon it) by means of the blocks *a a′* and the pillow H, which hold the bar steady and straight while it is being operated upon for forming the collar and shoulder.

The distance that the carriage moves may be more or less, according to the size and character of the work, which distance is regulated by the eccentric ring above referred to, which, by changing its relation to the eccentric end M′ of the shaft M, will carry the throw of said ring, and, consequently, the stroke of the pitman and the movement of the carriage. It will be noticed that the area of the guides is larger than that of the square part of the axle. The same is the case with the die, in which the taper end of the axle is inserted; hence there is no clamping of any part of the axle, either by the guide or the dies, in which the taper end of the axle is inserted; the object being not to clamp the metal at these two points, but to prevent deflection of the axle while being upset, the axle being held at its extreme ends only, and upon which ends the pressure for upsetting is applied.

What I claim as my invention, and desire to secure by Letters Patent, is—

1. In machines for the manufacture of axles, the adjusting center-screws C′ D, in combination with the guide-blocks *a a′*, stay I, guide-standards F, dies *e e′*, and carriage B, whereby the axle-blank is held at its extreme ends upon points or centers, and pressure applied thereto, thereby upsetting said blank, as described, and at the same time preventing deflection of the bar, substantially as set forth.

2. The combination of two centers, in line with each other, by and through which to apply the power required to upset the bar, and adjusting-guides or supporting devices intermediate between said centers, to prevent deflection of the bar while being upset, substantially as set forth.

JACOB KRITCH.

Witnesses:
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JOHN RIGG.