(No Model.)

W. COOKE & D. CARLOUGH.

APPARATUS FOR UPSETTING EYE BARS.

No. 406,501. Patented July 9, 1889.

Fig: 1.

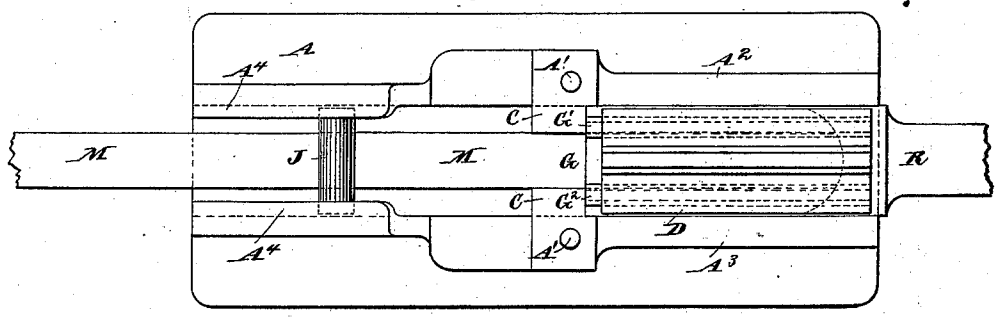


Fig: 2.

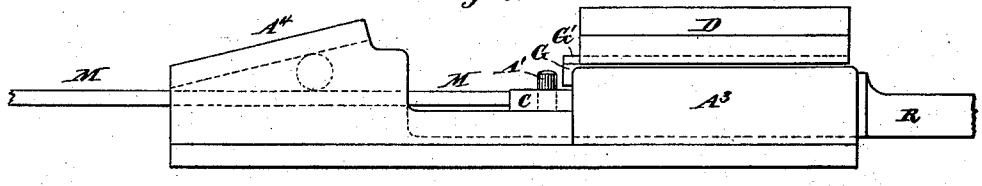


Fig: 3.

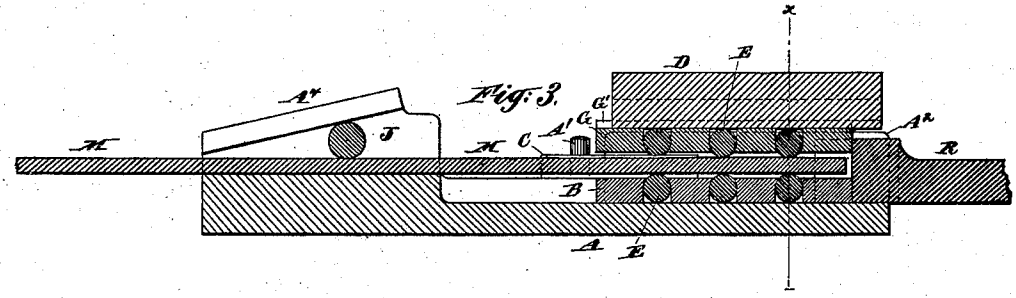


Fig: 4.

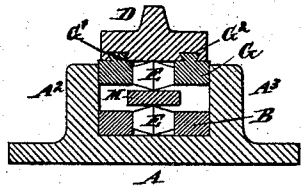
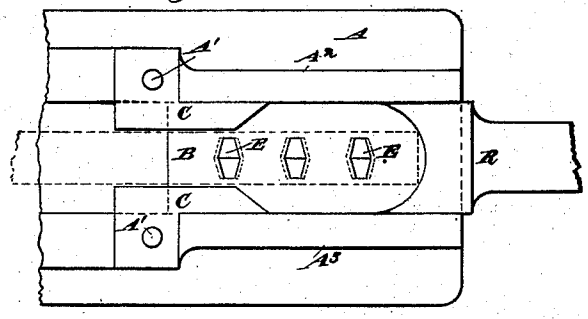


Fig: 5.



Witnesses:
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UNITED STATES PATENT OFFICE.

WATTS COOKE AND DANIEL CARLOUGH, OF PATERSON, NEW JERSEY.

APPARATUS FOR UPSETTING EYE-BARS.

SPECIFICATION forming part of Letters Patent No. 406,501, dated July 9, 1889.

Application filed April 17, 1889. Serial No. 307,548. (No model.)

To all whom it may concern:

Be it known that we, WATTS COOKE and DANIEL CARLOUGH, both of Paterson, Passaic county, in the State of New Jersey, have invented a certain new and useful Improvement in Machines for Upsetting Eye-Bars, of which the following is a specification.

It is common in the production of bars to serve as ties in bridges, roofs, and other engineering structures to produce the necessary enlargement of the ends of the otherwise uniformly-sectioned bar by heating the ends and compressing them endwise—technically, "upsetting." Several patents have been previously issued to ourselves and others for machines for this purpose. The hole required in the eye is produced afterward.

Our present invention contributes to the perfection of the result, and also, and especially, to the ease with which the machine is worked. The tendency to distortion of the metal by its irregular bending or buckling facewise is that which is mainly important to be resisted and prevented. We provide antifriction rollers which are brought into direct contact with the hot metal and receive this pressure and support the metal at a sufficient number of points to keep it properly restrained, while the frictional resistance is greatly reduced.

We will represent our machine as receiving the hot bar in a flat position, although it is obvious that it might be worked lying on the edge or in various other positions. We provide for holding the main body of the bar against end movement by means of a roller dropped upon it and engaged by its projecting ends under an inclined ledge or internal lip on each side.

The accompanying drawings form a part of this specification, and represent what we consider the best means of carrying out the invention.

Figure 1 is a plan view. Fig. 2 is an elevation showing the same parts in side view. Fig. 3 is a longitudinal section. Fig. 4 is a cross-section on the line $x\ x$ in Fig. 3. Fig. 5 is a plan view of a portion with the upper parts removed.

Similar letters of reference indicate corresponding parts in all the figures.

A is a flat bottom portion of the bed-casting.

A^2 and A^3 are side walls or stout ledges. Pins A′ A′ are set in low portions near the end at which the hot bar is received.

R is a ram, reciprocated as required between the ledges A^2 A^3, actuated by a steam-piston or other efficient means. (Not represented.) Its acting face is hollowed, so as to impart a corresponding rounded shape to that portion of the eye which is to be produced.

B is a bottom slide filling loosely the space between the ledges A^2 A^3, and E E E are anti-friction rollers mounted loosely in corresponding apertures, cored or otherwise produced in the slide B. The middle portion of each roller is of greater diameter than the thickness of the slide B.

C C are exchangeable cheeks fitted on the pins A′ and filling a portion of the space between the ledges A^2 A^3. These shape the neck of the eye.

G is a top slide, of equal thickness to the slide B, and similarly equipped with antifriction rollers. The rollers in both situations are marked E.

D is a strong platen or top piece which is raised and lowered by mechanism not shown. This top piece D and the top slide G are engaged together by two longitudinal ridges G′ G^2 of dovetail section on the one engaging in corresponding longitudinal grooves in the other. They are lifted and removed when required to allow the completed eye to be taken out of the machine by a vertical movement. The arrangement leaves the central line of the base of the platen plane, ready to serve as a way for the rollers. When the metal is being upset, the top piece or platen D being controlled by toggle-levers, a hydraulic press, or other efficient means, (not shown,) presses downward and resists the tendency of the top slide G to rise, but allows it to move endwise. Correspondingly the bottom slide B moves endwise, each pressing by its contained rollers against the adjacent face of the hot bar and restraining any tendency to buckle or bend, while allowing a widening to any extent required until the space provided for the eye is completely filled and the eye is nearly complete. It remains simply to hammer, roll,

or otherwise treat the metal of the eye after its removal from the machine to flatten and smooth the eye, and to sufficiently reduce its thickness if it has become too much thickened. The holding of the bar to enable it to maintain its place notwithstanding the strong endwise pressure received from the ram may be in part effected by any ordinary clamps or other means; but we provide specially efficient and easily-operated means for contributing to such holding.

J is a roller of plain cylindrical form, which before the upsetting-ram R commences to act is dropped upon the bar M, so as to lie transversely across such bar near the upsetting parts and engage under inclined wings A^4 A^4, which extend inward from the top of the said ridges. The roll is inserted with a slight force urging it to the left in the figures, and it rolls to the left until it is caught between the lower faces of A^4 and A^4 and the upper face of the hot bar. After it is thus caught it holds the bar M very rigidly. So soon as it is desired to release the bar M the roller J is moved toward the eye. This may be done by driving the main body of the bar in that direction, which may be done with ease after the ram R has been withdrawn, or it may be done by percussive or other force applied directly to the roller J. When the gripping effect of the roll J is thus ended and the platen D, with its connected slide G and its rollers E, is lifted and removed, the eye-bar may be lifted out of its place and removed ready to have its hole punched, and to be finally shaped either at the same or another heat. The form of the several apertures in the top slide G is such as to lift the rollers which are inclosed therein when the slide G is lifted. The rollers take the main force of the upward and downward pressure, and by carrying it with a rolling movement and bearing only on small surfaces greatly facilitate the desired change of condition of the metal and reduce the frictional resistance, while the flat faces of the slides B and G keep the hot metal in position and prevent buckling. The invention allows the hot metal to widen freely.

Modifications may be made by any good mechanic without departing from the principle or sacrificing the advantages of the invention. The hollowed form of the end of the ram R and of the corresponding parts of the top slide G and bottom slide B may be varied. The form of the rollers E may be varied. We prefer the double conical form shown. We can use a greater or less number of the rollers E.

We claim as our invention—

1. In a machine for upsetting eye-bars, the roller J and internal wings A^4, in combination with the top piece or platen D, bed A, and ram R, arranged to serve as herein specified.

2. In a machine for upsetting eye-bars, the bed A, with its side ledges A^2 A^3, the platen D, having two longitudinal grooves provided with two dovetail ridges G' G^2, the top slide G and bottom slide B, exchangeable cheeks C, the reciprocating ram R, and means for holding the bar against the action of the ram, all combined and arranged to serve as herein specified.

3. In a machine for upsetting eye-bars, the ram R, slides B and G, side ledges A^2 A^3, and cheeks C, in combination with each other and with anti-friction rollers E, in contact with the hot metal, arranged to receive directly the facewise-distending pressure of the bar in the act of upsetting, substantially as herein specified.

In testimony whereof we have hereunto set our hands at Paterson, Passaic county, New Jersey, this 11th day of April, 1889, in the presence of two subscribing witnesses.

WATTS COOKE.
DANIEL CARLOUGH.

Witnesses:
WM. M. SMITH,
J. M. R. WILLIAMS.