I. C. CHAPMAN.

Metal-Bending Machine.

No. 160,647. Patented March 9, 1875.

FIG. 2.

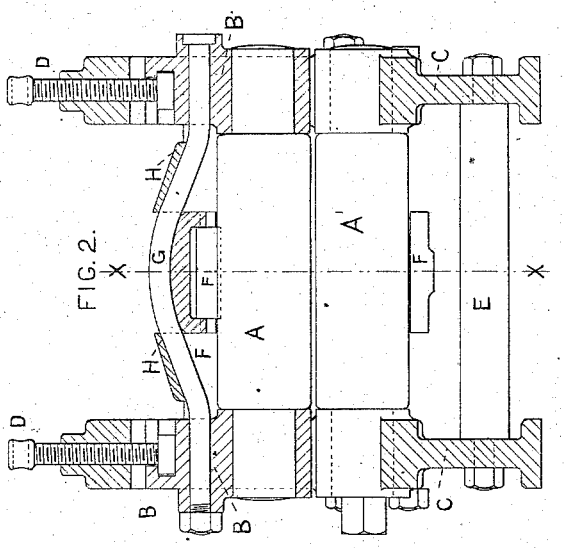


FIG. 5.

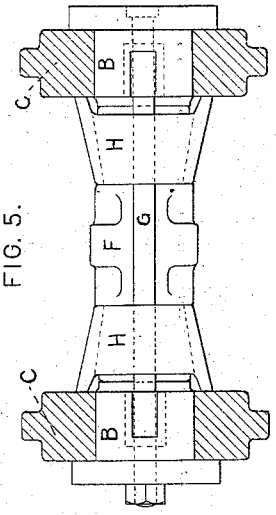


FIG. 1.

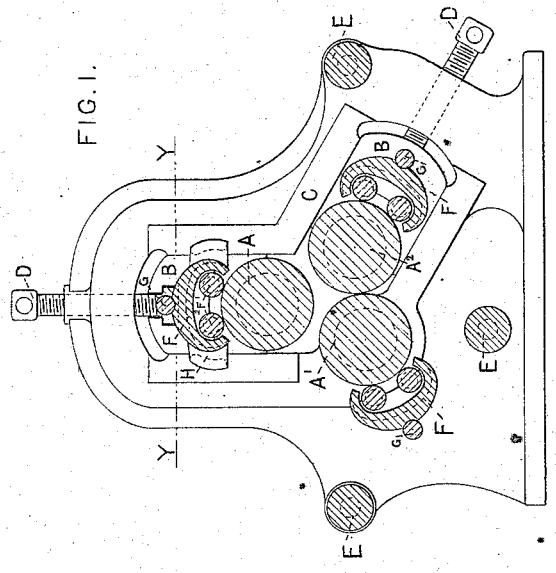


FIG. 4.

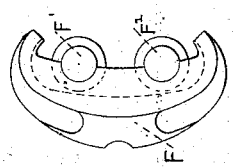
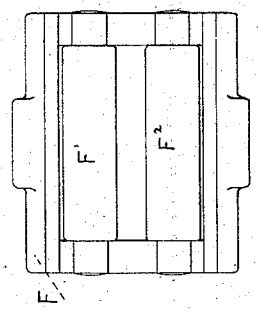


FIG 3.



WITNESSES.

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UNITED STATES PATENT OFFICE.

JOHN C. CHAPMAN, OF PASSAIC, NEW JERSEY.

IMPROVEMENT IN METAL-BENDING MACHINES.

Specification forming part of Letters Patent No. **160,647**, dated March 9, 1875; application filed September 28, 1874.

To all whom it may concern:

Be it known that I, JOHN C. CHAPMAN, of Passaic, in the county of Passaic and State of New Jersey, have invented certain Improvements in Metal-Bending Machines, of which the following is a specification:

This invention pertains to certain improvements in machines for bending plates or sheets of metal; and the invention consists in providing a central support to each of the rolls, at or near their centers, said supports being constructed of a saddle carrying friction-rolls, and a truss-rod bearing on said saddle, whereby the stiffness of the rolls is increased, and they are adapted to the bending of heavy plates of metal.

Figure 1 is a sectional elevation of the machine as would appear when made through the line *x x* in Fig. 2. Fig. 2 is a vertical section through the axis of the upper roll in the direction of its length. Fig. 3 is a plan of the under side of the supporting frame or saddle. Fig. 4 is an end view of the same. Fig. 5 is a view of the upper side of the supporting-frame for the saddle over the top roll, the section at *y y* of Fig. 1.

Bending-machines, as commonly made, answer all the ordinary purposes required; but if plates of unusual thickness or width are to be bent, then the ordinary rolls fail to furnish the required stiffness, and are liable to spring at their centers to such a degree as to fail to perform their work, or, if greatly strained, are often broken. But with my improvements applied to any bending-machine the stiffness of the rolls may be more than doubled, and the efficiency of the machine greatly increased.

The rolls are arranged and mounted as usual in said machines, and are shown at A A^1 A^2. The ends of each roll are supported by and are free to revolve in bearings, as at B, which are mounted in the frames C. The bearings of the top roll, and also one or both of the bottom rolls, are made adjustable, and are regulated by the set-screws D, as seen in Fig. 1. The frames are held in their proper positions apart by the struts or bars E. At the middle of each roll, and in a line to resist the greatest strain or deflection, is placed the supplemental bearing or support to the rolls, as at F, Figs. 1, 2, and 5, and as shown in detail and enlarged in Figs. 3 and 4. Said support is composed of a saddle, as at F, and stay-rod, as at G, which hold in position two friction-rolls, F^1 and F^2, which bear upon the surface of the bending-rolls, and said saddles are held in position by the truss or tension rods G, which extend across from one frame to the other, and are curved over in the form of an arch, as shown in Fig. 2, and are held in tension by a screw-nut at one end, and may be used up to the breaking strain of the rod.

By such an arrangement, when the rod G is under tension, and the saddle F, with its rolls, is held in position over the center of the bending-roll, thereby forming a strut between the truss-rod and the roll, any tendency to deflection in the roll is resisted by the rod G, and therefore the strength of the roll may be increased to a degree equal to the tensile strength of the truss-rod G. Of course the same degree of stiffness might be produced by increasing the size of the rolls; but this will add greatly to the cost of the machine, as well as make it very cumbersome, but it also renders such a machine useless for bending small curves or cylinders.

It may also be observed that in such a machine, where the upper portion of the frame is not provided with the struts or bars E, to hold them apart, a movable strut, or two or more pieces, as at H, may be introduced, with their ends bearing upon the inner sides of the frame above the top roll, and against the ends of the saddle, so as to prevent a pressure upon the shoulders of the roll, as seen in Figs. 2 and 5.

Having thus fully described my invention, I claim—

1. The combination of the support or saddle F, having friction-rolls F^1 and rod G, with the frame of a metal-bending machine, to support the bending-rolls, as described, and for the purposes set forth.

2. The combination, with the supports or saddles F, having friction-rolls, the truss-rod G, and the frame of a metal-bending machine, of the supplemental stays H, substantially as and for the purpose described.

JOHN C. CHAPMAN.

Witnesses:

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