(No Model.)

J. BAUM.

METAL BENDING MACHINE.

No. 492,858. Patented Mar. 7, 1893.

FIG. 1.

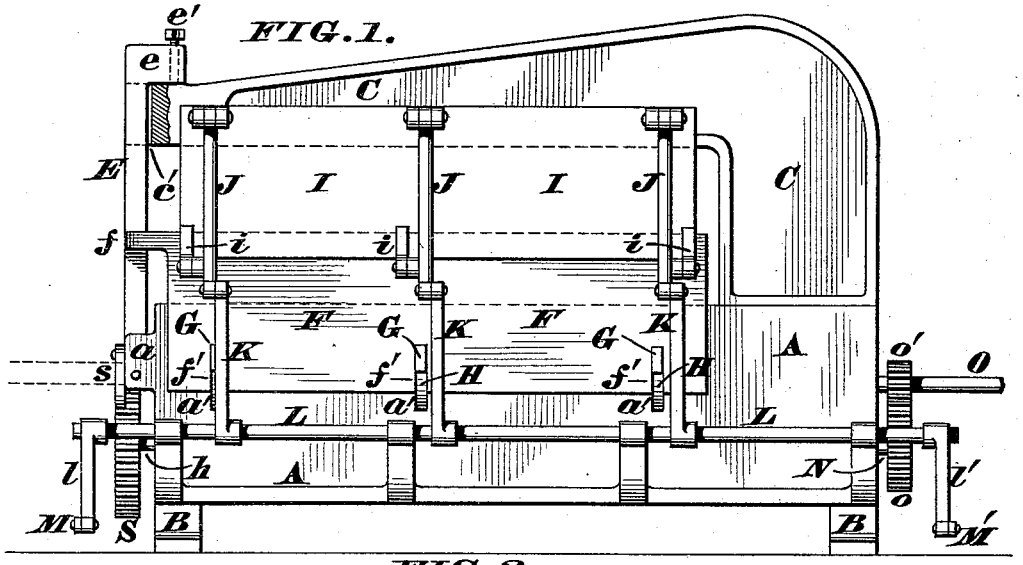

FIG. 2.

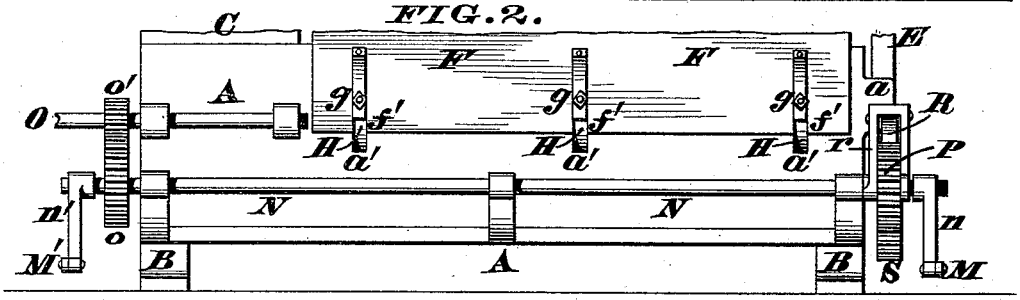

FIG. 3.

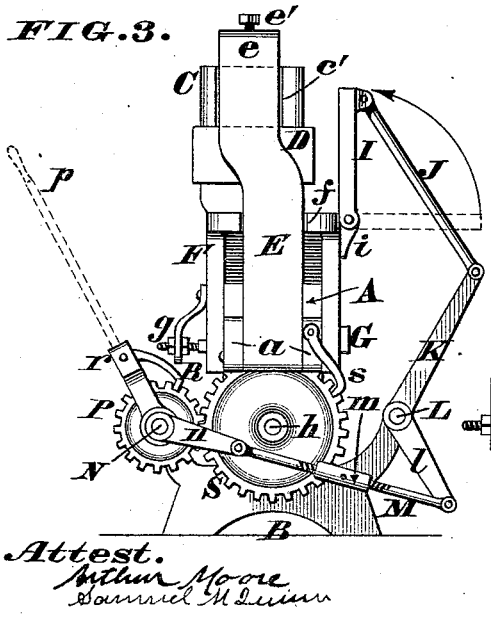

FIG. 4.

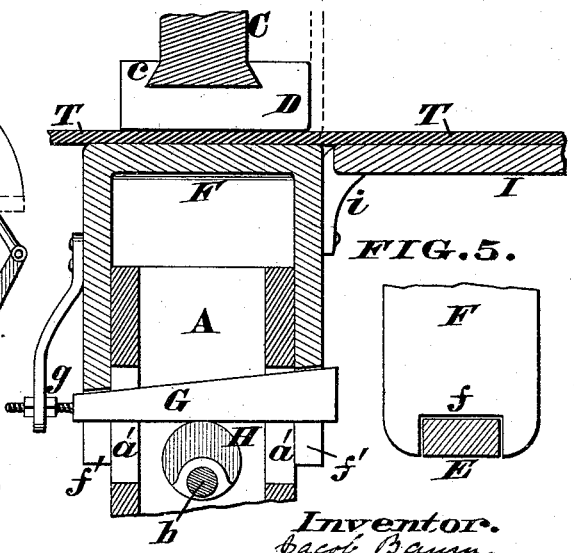

FIG. 5.

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UNITED STATES PATENT OFFICE.

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METAL-BENDING MACHINE.

SPECIFICATION forming part of Letters Patent No. 492,858, dated March 7, 1893.

Application filed October 31, 1892. Serial No. 450,493. (No model.)

To all whom it may concern.

Be it known that I, JACOB BAUM, a citizen of the United States, residing at Cincinnati, in the county of Hamilton and State of Ohio, have invented certain new and useful Improvements in Metal-Bending Machines; and I do hereby declare the following to be a full, clear, and exact description of the invention, reference being had to the annexed drawings, which form part of this specification.

My invention comprises a powerful machine designed more especially for bending plates and angle-irons to be subsequently used in the manufacture of safes and similar metallic structures, the details of said machine and the method of operating it being hereinafter more fully described.

In the annexed drawings,—Figure 1 is a side elevation of my improved bending-machine. Fig. 2 is an elevation of a portion of the opposite side thereof. Fig. 3 is an end elevation. Figs. 4 and 5 are enlarged views of details.

The principal member of the machine is a hollow base A, supported upon feet B, and having secured to one end a heavy arm C, whose lower edge has a flaring flange *c*, as represented in Fig. 4 for the ready attachment of one or more shiftable die-blocks D. Base A has a pair of end lugs *a*, *a*, to which a stout tie-bar E is pivoted, the top of this bar being provided with a lug *e*, within which latter a clamp screw *e'* is tapped. *c'* is a notch in the end of arm C, to admit this bar when swung up to the position shown in Figs. 1 and 3.

Adapted to be adjusted vertically on the base A is a table F, the shape of which is more clearly seen in Fig. 4, the end of this table being notched at *f* to admit the bar E. Furthermore, the sides of this table are slotted at *f'*, to receive wedges G, that traverse corresponding slots *a'*, in the base A, the wedges, of which two or more may be used, being supported upon cams or other lifters H, of a shaft *h* running longitudinally of said base. *g* are screws for adjusting these wedges, so as to impart a proper lift to the table F. Hinged to this table, near its upper edge at *i*, is a folding-plate I, whose free edge has one or more links J coupled to it, the opposite ends of these links being connected to arms K, projecting rigidly from a longitudinal rock-shaft L. This shaft is journaled in bearings projecting from the base, and has at its ends cranks *l*, *l'*. M, M', are rods connecting these cranks with similar devices *n*, *n'*, secured to the ends of a longitudinal counter-shaft N, each connecting rod being made of two pieces united by right and left hand screws to a common nut *m*, as seen in Fig. 3. By this arrangement the proper throw of cranks *l*, *l'*, can be readily secured, for the purpose of effecting a correct movement of the folder I. Shaft N has secured to it near one end a wheel *o*, gearing with a pinion *o'* on the main shaft O, which latter may have a fast and loose pulley, or be provided with a clutch mechanism for starting and stopping the bender. Revolving loosely on said shaft is a pinion P, capable of being turned by a pawl R, carried by a stirrup *r*. This stirrup is also fitted loosely on shaft N, and can be operated at any time, by inserting a lever in it, as indicated by the dotted line *p*. Pinion P gears with a wheel S secured to the end of shaft *h*, said wheel being locked by a pawl *s*, pivoted to one of the lugs *a*.

My machine is operated in the following manner. Normally the upper surface of folder I is flush with the top of table F, and being hinged to the latter, it will maintain this position when said table is both raised and lowered. Furthermore, in this normal condition of the machine, the tie-bar E is swung down to the horizontal position indicated by dotted lines in Fig. 1, thereby affording convenient access to the table and permitting the introduction of special forms of plates or bars. A sufficient number of die-blocks D are applied to the flanged portion *c* of arm C, and the table F is adjusted approximately to the required height, which adjustment is readily effected by inserting a lever *p*, within the stirrup *r*, and so operating said lever as to turn the pinion P, wheel S, shaft *h*, and its attached cams G. These adjustments having been effected, the plate T, seen only in Fig. 4, is placed upon the table F, and folder I, and then the tie-bar E is swung up until its lug *e*, rests upon the arm C, after

which act, said bar is retained in place by tightening the screw *e'*. A few more turns are then given to pinion P, for the purpose of finally raising the table F, and thereby clamping the plate T immovably between it and the die-blocks D. The machine is now set in motion, the turning of shaft N causing a rocking of the other shaft L, which gradually, but irresistibly brings the folder I up to the position seen in Figs. 1 and 3. Consequently, the plate T is bent at a right angle against the die-block D, as indicated by dotted lines in Fig. 4. A reverse rocking of shaft L, brings the folder I back to its normal position, and then the table is slightly lowered, the plate T shifted forward and another bend made in it. By this procedure, a single plate can be readily bent to form the top, bottom and sides of a safe, and after being bent to this box shape, the tie-bar E is liberated and swung down, and then the box is readily removed from the machine. It will thus be seen that said bar performs the twofold purpose of a tie that binds the arm to the base, so as to prevent said arm being sprung or broken, and it also facilitates the ready removal of the bent article, no matter whether it is a plate, angle-iron or other piece of metal.

I claim as my invention—

1. The combination, in a metal-bending machine, of a stationary base, an immovable arm rigidly secured at one end to said base and having its other end coupled thereto by a shiftable tie-rod, a folding plate that bends the metal upwardly, and means for operating said plate, substantially as herein described.

2. The combination, in a metal-bending machine, of a stationary base, an immovable arm rigidly secured at one end to said base and having its other end coupled thereto by a shiftable tie-rod, a vertically-adjustable table applied to said base, devices for raising and lowering said table, a folding plate coupled to the latter and means for operating said plate, substantially as herein described.

3. A metal-bending machine, including a base, a vertically-adjustable table applied to it, a folding plate coupled to said table, and a set of cams carried by a common shaft and adapted to elevate said table, in the manner described.

4. The combination, in a metal-bending machine, of a vertically-adjustable table, wedges upon which said table rests, and cams that operate said wedges, in the manner described.

5. The combination, in a metal-bending machine, of a stationary base, an arm rigidly secured to it at one end, and a swinging tie-rod that couples the other end of said arm to said base, for the purpose herein described.

6. The combination, in a metal-bending machine, of the stationary base A, an arm C rigidly secured at one end to said base, and having a notch *c'* at its other end, and the tie-rod E, pivoted to said base, the upper end of said rod being adapted to enter said notch, and having a lug *e*, that rests upon said arm, for the purpose described.

In testimony whereof I affix my signature in presence of two witnesses.

JACOB BAUM.

Witnesses:
JAMES H. LAYMAN,
FRANCIS M. BIDDLE.