J. BRAUN.

MACHINES FOR BENDING METAL-PLATES.

No. 194,409. Patented Aug. 21, 1877.

Fig. 1.

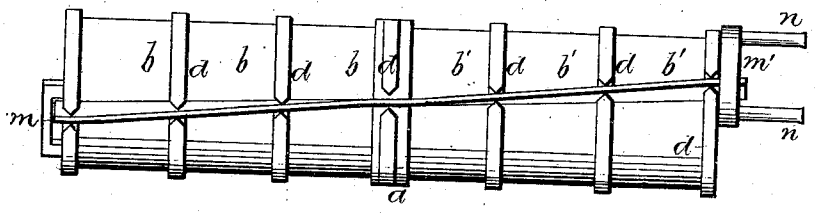


Fig. 2.

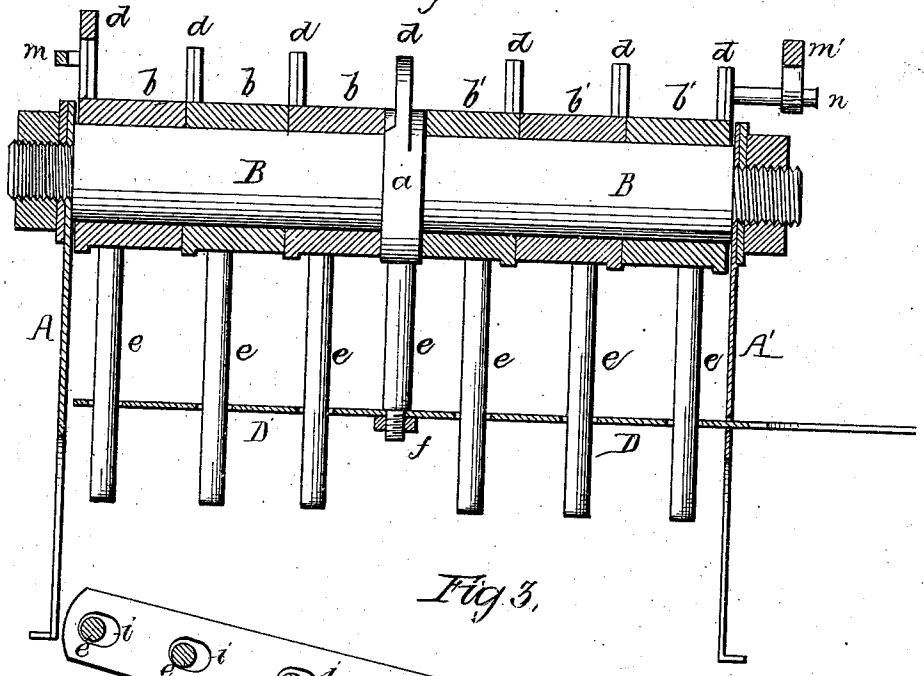


Fig. 3.

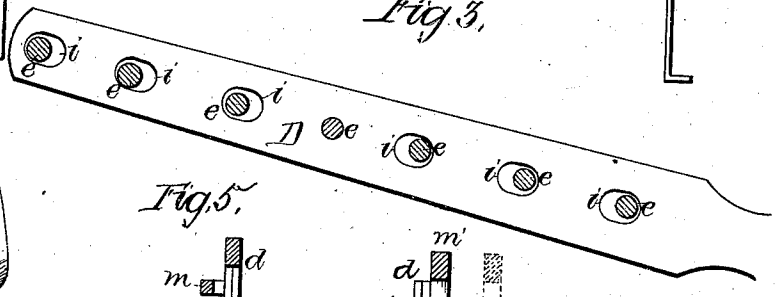


Fig. 4.

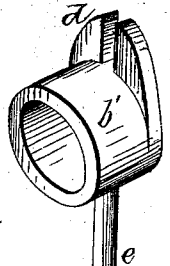
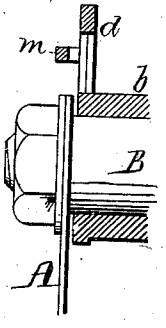


Fig. 5.



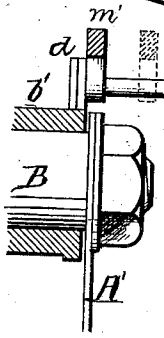


Fig. 6.

Witnesses,
Harry A. Crawford.
Harry Smith

Inventor.
John Braun
by his Attorney
Howson and Sons.

N. PETERS, PHOTO-LITHOGRAPHER, WASHINGTON, D. C.

UNITED STATES PATENT OFFICE.

JOHN BRAUN, OF PHILADELPHIA, PENNSYLVANIA.

IMPROVEMENT IN MACHINES FOR BENDING METAL PLATES.

Specification forming part of Letters Patent No. **194,409**, dated August 21, 1877; application filed July 16, 1877.

To all whom it may concern:

Be it known that I, JOHN BRAUN, of Philadelphia, Pennsylvania, have invented a new and useful Improvement in Machines for Bending Metal Plates, of which the following is a specification:

The object of my invention is to construct a machine for bending thin metal plates, the machine being especially adapted for the manufacture of knives for lawn-mowers, &c. This object I attain in the manner which I will now proceed to describe, reference being had to the accompanying drawing, in which—

Figure 1 is a plan view of the machine; Fig. 2, a vertical section of the same; and Figs. 3, 4, 5, and 6, detached views of parts of the machine.

A A′ is a frame-work, which carries near the top a shaft, B, provided with a central collar, *a*, and carrying, in the present instance, on one side of said collar, three sleeves, *b*, and on the opposite side of the same three similar sleeves, *b′*, each sleeve being hung to the shaft so as to turn freely thereon. Each of these sleeves *b b′* has at one end a lug, *d*, which projects above the top of the sleeve, and is slotted at the center, as shown in the perspective view, Fig. 4, and the collar *a* is furnished with a similar slotted lug.

Both the collar *a* and sleeves *b b′* are provided with downwardly-projecting arms *e*, that of the collar *a* serving as a pivot for a lever, D, secured to the lower end of said arm by a nut, *f*, and having openings *i*, to which are adapted the lower ends of the arms *e* of the sleeves *b b′*. (See Figs. 2 and 3.)

The lug *d*, on the outermost one of the sleeves *b*, has a yoke, *m*, secured to the outside of the same, and extending across the slot in the lug, so as to serve as a stop. The lug on the outermost one of the sleeves *b′* carries a plate, *m′*, which has a slot of a character similar to, and in line with, that in the lug, and is adapted to pins *n* on the said lug, so that it can be moved longitudinally.

The operation of the above machine is as follows: The lever D is first brought into line with the axis of the shaft B, the arms *e* and the slots of the lugs *d* being then also in line therewith. The plate *m′* is now moved outward, and the blade of metal to be bent is inserted vertically into the slots of the lugs, and then moved laterally until its end comes in contact with the stop *m*, when the plate *m′* is moved inward so as to confine its opposite end. The lever D is now operated, thus causing the sleeves *b* to turn on the shaft B in one direction, and the sleeves *b′* in the opposite direction, the effect of this movement on the blade being to twist the same, the extent of the twist gradually increasing from the center of the blade toward each end, owing to the differential movements imparted to the sleeves *b b′*, because of the varying distance between their arms *e* and the pivot of the lever D.

When the blade has been twisted, the plate *m′* is moved out so as to release the end of the same, and it is then lifted out, and the parts restored to their normal position prior to the introduction of a fresh blade.

By this machine the blades may be twisted rapidly and accurately, the extent of twist imparted to the blade being governed by the vertical position of the lever D in respect to the shaft B, and by the extent of movement imparted to said lever. Moreover, owing to the fact that the lower edge of the blade rests directly on the sleeves, the angle assumed by the same when twisted will be such that when the blade is applied to the cylinder of the mower its base will rest solidly on the surface of said cylinder.

It will be evident that a greater or less number of sleeves *b b′* than is shown may be used, if desired.

I claim as my invention—

1. The combination of the shaft B with the collar *a* and vibrating sleeves *b b′*, having slotted lugs *d*, as set forth.

2. The combination of the shaft B, sleeves *b b′*, and their rods *e*, and the operating lever D, as specified.

3. The combination of the outermost sleeve *b* with the stop *m*, as specified.

4. The combination of the outermost sleeve *b′* with a slotted retaining-plate, *m′*, as set forth.

5. The combination of the outermost sleeve b' with a slotted retaining-plate, m', arranged to slide longitudinally, as described.

6. The combination of a series of sleeves, $b\ b'$, each having a lug, d, with a slot extending to the body of the sleeve, whereby a solid support is afforded for the lower edge of the blade during the bending operation, as specified.

In testimony whereof I have signed my name to this specification in the presence of two subscribing witnesses.

JOHN BRAUN.

Witnesses:
HERMANN MOESSNER,
HARRY SMITH.