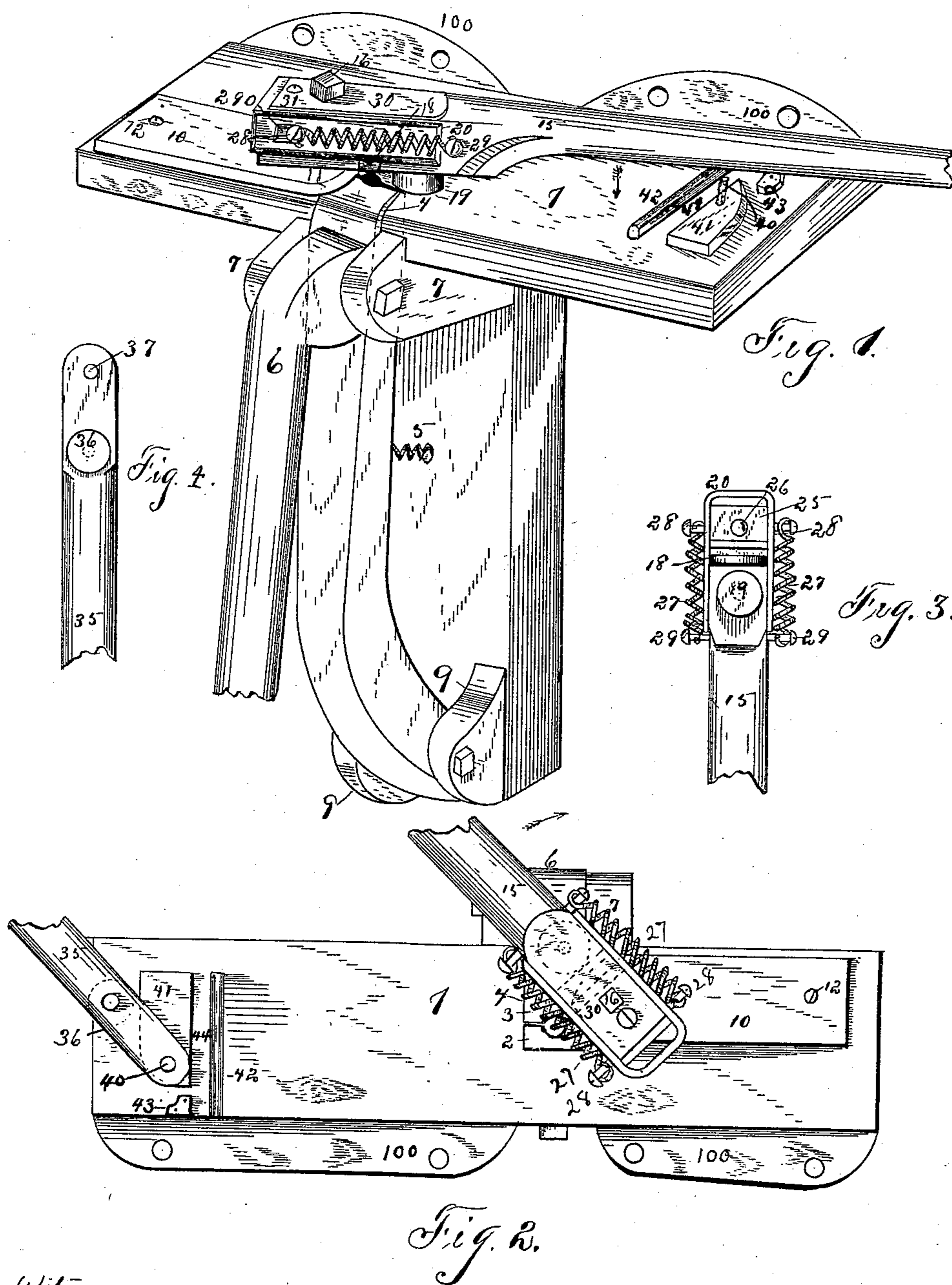


(No Model.)

A. M. TIBBITS.  
METAL BENDING MACHINE.

No. 453,172.

Patented May 26, 1891.



Witnesses  
O. W. Johnson.  
J. R. Nottingham

Austin M. Tibbits  
Inventor  
By W. A. Bartlett  
Atty.

# UNITED STATES PATENT OFFICE.

AUSTIN M. TIBBITS, OF CORTLAND, NEW YORK.

## METAL-BENDING MACHINE.

SPECIFICATION forming part of Letters Patent No. 453,172, dated May 26, 1891.

Application filed June 9, 1890. Serial No. 354,713. (No model.)

*To all whom it may concern:*

Be it known that I, AUSTIN M. TIBBITS, of Cortland, in the county of Cortland and State of New York, have invented certain new and useful Improvements in Metal-Bending Machines, of which the following is a specification, reference being had therein to the accompanying drawings.

This invention relates to machines for bending metal rods, especially such as are used in carriage-making.

The object of the invention is to produce a machine in which a rod may be clamped and held and bent in one or more directions by lever-power and with a minimum of friction and resistance.

Figure 1 is a perspective view of a machine embodying the invention. Fig. 2 is a top plan of the same. Fig. 3 is a broken detail view of the under side of the bending-lever. Fig. 4 is a similar view of a second or finishing lever used on some kinds of work.

The numeral 1 indicates the bed or table of the bending-machine. This bed or table is firmly attached to the fixed jaw 2 of a vise. The table may have extensions 100 where desirable. The movable jaw 3 of the vise works in a slot 4 in the table and is pressed open by a spring 5. A cam-lever 6, pivoted between lugs 7, (on the table or fixed jaw,) serves to close the jaw 3 against jaw 2, as is common in bench-vises. A former 10 is firmly attached to the table of the machine. The end 11 of this former is of the shape to which it is desired to bend the rod. The former may be secured to the table by a screw or bolt 12, passing through it or in other suitable manner. A hand-lever 15 is pivoted to the table at a little distance from the end of the former and the jaws by a bolt or rod 16, which passes through the lever and former into or through a perforation in the table. The lever 15 has a roller 18 supported on a horizontal axis in position to ride centrally over or across the jaws 2 3 when the lever 15 is swung on its pivot. A roller 19 on a vertical axis swings past the central position of the jaws 2 3. Thus roll 18 will tend to bear on the side of a rod clasped in the jaw until the rod is bent down, when roll 18 will ride on top of the rod, and roll 19 will bear against the side of the rod and bend it sidewise around former 11, when

the lever 18 is swung on its pivot. The lever 15 has a strap or band 20 extending for some distance along the sides and round the end thereof. The part 25 of the lever is inclosed within this strap 20, and has a hole 26 for the passage of bolt 16. The block 25 is connected to the main part 15 of the lever by springs 27, which springs have one end secured to pins or bars 28 on lever-section 25 and at the other end to pins or supports 29 on the lever proper. Pins 28 pass through slots 290 in the strap 20. Thus the lever is slightly extensible or yielding in length, the two sections being held together by springs 27. A top plate 30 extends over the joint between the two sections of the lever, and is attached to the pivotal section by a screw 31. This top plate strengthens the joint between the lever-sections. Assuming now that the machine be in the position shown in Fig. 1 and the end of a rod be clamped between jaws 2 and 3, the upper end of the rod will extend upward from the jaws alongside the lever 15. When the lever 15 is swung in the direction of the arrow, the roller 18 will press on one side of the rod and roller 19 on a side at a right angle therefrom, and the rod will be bent both down and sidewise around the end 11 of the former 10. The pivoted end of the lever will turn on its pivot; but the long end or sweep 15 will yield slightly against the pressure of springs 27, so as to carry roller 19 a little farther away from its pivot if the pressure be too great, as when the rod is of excessive diameter. When the lever is in the position shown in Fig. 2, the rod will have been bent down by roll 18 and the roll 19 will be bending the rod around the former. The bending will be completed, or nearly so, when the lever 15 is about at a right angle to the edge of the table. The rod may be heated before being clamped in the vise; but will usually be bent cold. The pivot 16 holds the lever 15 in a position about parallel with the face of the table against an upward pressure. Consequently a straight rod held in the jaws must be bent down against the table by the pressure of roll 18, and will be bent sidewise between roll 19 and the former 10 when the lever is swung on its pivot. The lever 35, omitted in Fig. 1, is pivoted on a suitable pivot 40 near the edge of the former 41, the pivot passing through hole 37 in

the lever. The abutments 42 and 43 serve to clamp a rod, so that it may be bent between the roll 36 and the former 41. The arrangements of abutments 42 and 43 and the lever 35 permits the bending of the stem of a T-shaped rod or bar, the cross of the T being placed in groove 44, and the stem placed against the former to be curved by the lever 35 and its roller. It is not always essential that the rollers 19 36, &c., should rotate. A rounded surface will approximate the same results. The rod may be held in the vise and brought nearly to form by the yielding roll or abutment 19 of the lever 15, and the bending finished by lever 35, having the unyielding abutment. In fact, with the machine described a great variety of work may be done.

What I claim is—

1. In a metal-bending machine, the combination of a clamping-vise, a former near the jaws thereof, and a lever pivoted near the former and having a roller or similar bearing-surface with its edge toward the former, and a second roller at right angles thereto for giving the first bend, co-operating with the jaws of the vise, acting as a first former, substantially as described.

2. In a metal-bending machine, the combi-

nation of a table, a former thereon, a lever in sections, having one section pivoted to the table near the former and having operating-rolls, one on a vertical and one on a horizontal shaft on the other section of said lever, the lever-sections being connected by springs and straps, substantially as described.

3. The combination, with the table secured to the fixed jaw of a vise and having the other vise-jaw movable in a slot therein, of a former in proximity to the vise, an extensible or yielding lever pivoted near the former, and rollers at right angles to each other, mounted on the yielding lever, substantially as described.

4. In a metal-bending machine, the combination of the bed or table, a holding-vise, and a lever sweep having one unyielding abutment facing the vise-jaws, with a former and a yielding abutment in the lever sweep, placed at right angles to the first abutment, substantially as described.

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

AUSTIN M. TIBBITS.

Witnesses:

JOHN W. SUGGETT,

GEORGE J. MAYCUMBER.