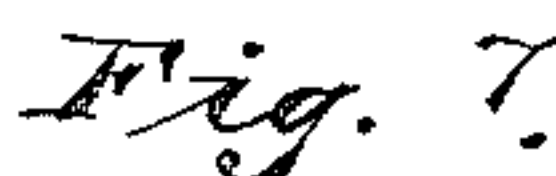


2 Sheets—Sheet 1.

MACHINE FOR MAKING METALLIC ROOFING.

Patented May 26, 1885.



WITNESSES

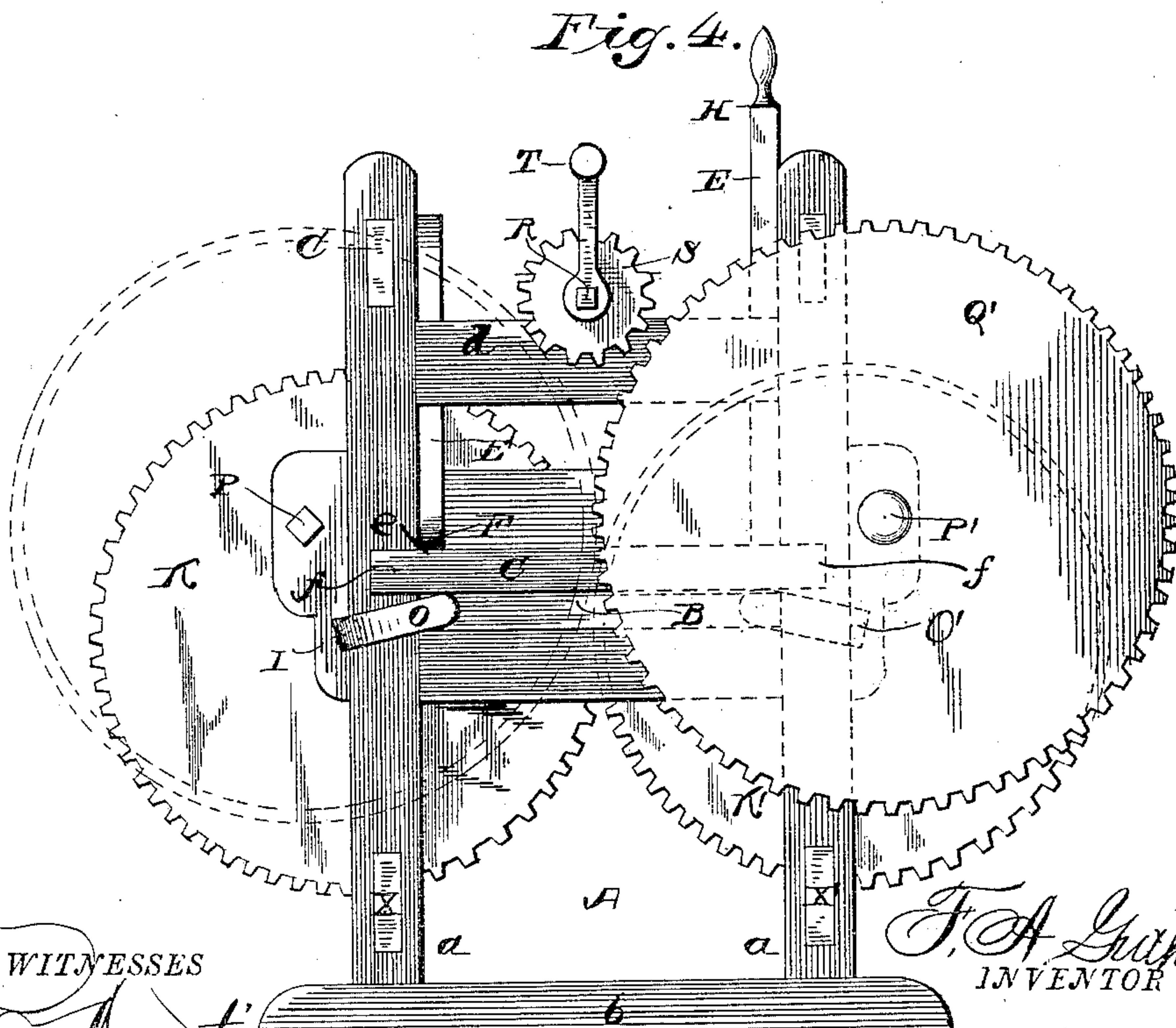
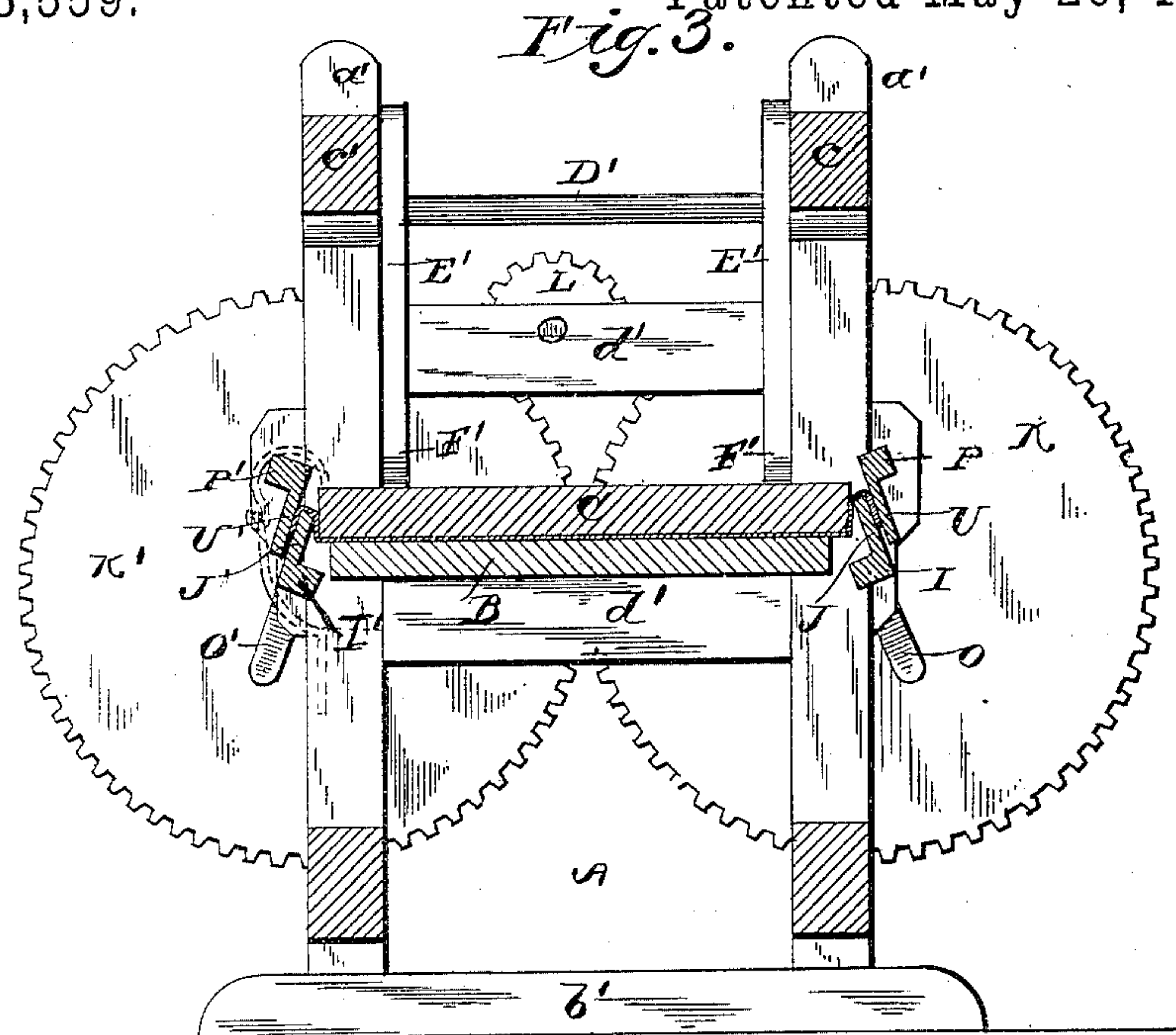
INVENTOR

Attorneys

2 Sheets—Sheet 2.

MACHINE FOR MAKING METALLIC ROOFING.

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WITNESSES

INVENTOR

Attorney

UNITED STATES PATENT OFFICE.

FRANK AUGUSTUS GUTHRIE, OF GALLIPOLIS, OHIO.

MACHINE FOR MAKING METALLIC ROOFING.

SPECIFICATION forming part of Letters Patent No. 318,559, dated May 26, 1885.

Application filed September 20, 1884. (No model.)

To all whom it may concern:

Be it known that I, FRANK A. GUTHRIE, a citizen of the United States, residing at Gallipolis, in the county of Gallia and State of Ohio, have invented a new and useful Machine for Making Metallic Roofing, of which the following is a specification, reference being had to the accompanying drawings.

This invention relates to machines for making metallic roofing; and it has for its object to provide means for this purpose which may be operated with ease and rapidity to bend the sheet metal without breaking it.

A further object of the invention is to provide means for readily introducing the metal into the machine, holding it firmly in position while being acted upon, and withdrawing it therefrom when the proper bend has been made.

With these ends in view the said invention consists in certain details of construction and combination of parts, as hereinafter set forth, and particularly pointed out in the claims.

In the accompanying drawings, Figure 1 is a perspective view showing the machine in position preparatory to introducing the sheet metal, the raised platform being in the elevated position. Fig. 2 is a longitudinal sectional view showing the machine in position after the metal has been introduced and the first bend made by the lower bending tool or knife. Fig. 3 is a longitudinal sectional view showing the second bend made by the upper bending tool or knife. Fig. 4 is a side elevation of the machine in the position shown in Fig. 3, parts being indicated in dotted lines. Fig. 5 is a detached view showing more clearly the arrangement of the interlocking rods. Fig. 6 illustrates the first action of the machine on the sheet metal, and Fig. 7 illustrates the final action.

Like letters are used to indicate corresponding parts in the several figures.

Referring to the drawings, A designates the frame of my improved machine, consisting of upright corner posts or standards, $a a'$, resting upon and secured to base-blocks $b b'$, and connected by longitudinal bars $c c'$ and transverse bars $d d'$.

B designates a stationary table having notches at its corners to fit around and be-

tween the posts $a a'$, and secured to the transverse bars $d d'$, said table providing a rest for the sheet metal while being acted upon.

C designates a movable platform having notches $e e'$ formed in its sides, near the corners, to receive the corner-posts $a a'$, the notches forming flanges $f f'$, which fit over the outer face of said posts and guide the platform in its movements. It will be seen that this platform serves as a means for clamping the sheet metal against the table, and for this purpose it is provided with means for holding it down in position and for raising the same when the machine has completed its operation, as will be hereinafter described.

To the longitudinal bars $c c'$ are pivoted shafts D D', one at each end of the machine, having depending bars E E', two on each shaft, the lower end of the bars carrying shoes F F', which engage with the upper face of the rising platform C. A rod, G, connects the bars E, so as to brace the same, and a lever, H, is pivoted to one of the shafts D, and is arranged to operate the same, and the other shaft to force the bars E E' simultaneously down in position, as seen in Fig. 2. The bars with their operating devices are shown in the elevated position in Fig. 1, so as to permit the raising of the platform.

I I' designate a pair of shafts having their ends journaled in boxes attached to the sides of the corner-posts $a a'$, the body of the shafts being square in cross-section, the flat bending knives or tools J J' being secured to the lower side of the shaft, projecting outwardly therefrom and inclining slightly inward.

Arms O O' are secured on the shaft at each end beyond the frame, and are adapted to engage with the under side of the platform, below the flanges $f f'$, one of the ends of the shafts I I' having gear-wheels K K' mounted thereon and engaging with each other, a pinion, L, attached to a shaft, M, journaled in the transverse bars $d d'$, imparting motion, by means of a crank, T, to the wheel K, which motion is transmitted to the other wheel.

It will be observed that by the operation of the crank-handle motion is communicated to the gear-wheels by the pinion L, causing the turning of the shafts I I', the arms O O' bearing against the under side of the platform at each

of the four corners, the continued turning of the shafts raising the arms to elevate the platform into the position shown in Fig. 1, preparatory to introducing the sheet metal.

5 P P' designate shafts similar to the shafts I I', journaled in boxes secured to the side of the posts *a*, one end of the shafts P P' having gear-wheels Q Q' mounted thereon and engaging with each other. A shaft, R, is mounted in
10 the bars *d d'*, and carries a pinion, S, engaging with one of the gear-wheels, a crank-handle, T, imparting motion to the shaft of the pinion. The shafts P P' are square in cross-section, and have the upper flat bending-
15 knives, U U', secured to the inner side thereof and projecting outwardly therefrom, said knives being employed to make the final bend to the metal.

V V' designate brace-rods, secured to the upper face of the platform at each side, and having hooks *i i'* formed on its ends, which engage with the shafts I I' at the cut-away portion *l*. Corresponding hooked brace-rods W
20 W' are secured to upright bars projecting from the sills X X', the hooks of the rods V W interlocking with each other when the platform is lowered into position for operation. In this manner the platform will be braced and held down, no matter what the pressure may
30 be against the metal in bending. As seen, the hooks meet together at the cut-away or reduced portion *l* of the knives J J', and interlock with each other, the construction being such that the knives will be at liberty to revolve in bending the metal.
35

The operation of my invention will be readily understood from the foregoing description, taken in connection with the annexed drawings.

40 The platform C is raised by the operation of the gear-wheels K K' to revolve the shafts I I' and cause the arms O O' to force the platform upward into the position shown in Fig. 1. Since the arms O O' bear against the under
45 side of the platform at the four corners, at which points it is guided by the corner-posts *a a'*, said platform will be elevated gradually, yet positively, into the proper position, where it will be upheld by the aforesaid arms. The
50 sheet metal is then laid on the table B so that either one or both ends will project sufficiently beyond the edge of the table to provide the necessary bend. The platform is then lowered by the operation of crank T, moving the pin-
55 ion L and driving the gear-wheels K K' to rotate the shafts I I', and when the platform has reached its limit of movement the lever H is operated to turn the shafts D D', causing the bars E E' to be thrown into a vertical position, the shoes F F' bearing against the upper face
60 of the platform and binding it down. As the platform reaches the table B the hooked brace-rods V W interlock and serve as an additional means for holding the platform from upward
65 movement. As seen, the sheet metal is clamped between the table and the platform, its end projecting outward a sufficient distance there-

from to provide the necessary bend. By the continued movement of the shafts I I', through the intermediate gearing aforesaid, the lower
70 knives, J J', are brought up into the position shown in Fig. 2, to bend the projecting end of the metal in an upward direction against the edge of the table and platform. The metal
75 has been bent by this operation into the form shown in Fig. 6. To complete the bend, the gear-wheels Q Q' are operated by the pinion S, through the crank-handle T, to cause the revolution of the shafts P P' and the forcing
80 of the knives U U' against the turned-up edge of the metal, said knives pressing or bending the edge over the lower knives, J J', into the form shown in Fig. 7. The final operation of the machine is illustrated in Fig. 3. When
85 the bend has been completed, the bars E are raised by the lever H to withdraw the shoes F F' from the platform C, the latter being raised by the arms or cams O O' in the manner hereinbefore stated.

It will be seen that by the construction shown
90 I am enabled to bend both sides of the metal in the same direction by the simultaneous action of the two sets of bending-knives. This bending is accomplished in a slow and gradual manner without breaking. For this reason I
95 am enabled to bend cold-blast or stone-coal iron, which hitherto occasioned considerable waste of time and labor in bending, and there is no possibility of breaking it.

It will also be observed that the platform
100 will be held securely down in position by the means shown and described, and will also be provided with means for raising or lowering said platform as desired.

As seen, the boxes in which the shafts I I'
105 are journaled are smaller than the boxes forming the journals of the shafts P P', thereby setting the latter farther out, so that its knives U U' will give the requisite three-sixteenths
110 of an inch bend to the metal. This bend or cap will present a round smooth surface without breaks or abrasions.

The machine is simple in construction, positive in its actions, and may be operated with ease and rapidity to effect the proper bending
115 of the metal. It is inexpensive in construction, and cannot work out of order, and may be operated by hand or steam.

Having described my invention, I claim—

1. In a sheet-metal-bending machine, the
120 combination, with the table, its supporting-frame, and means for clamping the metal against the table, of shafts carrying bending-knives, arranged in an upper and lower series and journaled in boxes, the boxes of the upper
125 series being set out beyond the boxes of the lower series, and means, substantially as described, for operating the knives of each set, as set forth.

2. In a machine for bending sheet metal, the
130 combination, with its supporting-frame, of the clamping-platform cut out or recessed at or near the corners to work between and fit around the posts of the frame, knives for bending the

sheet metal, the shafts on which the knives are mounted, and arms or cams on the ends of the shafts and actuated by the movement thereof to bear against the projecting ends of the platform, as set forth.

5 3. In a sheet-metal-bending machine, the combination, with the table and its supporting-frame, of the platform, means for locking it down against the table, knives for bending
10 the sheet metal, the shafts on which the knives are secured, a set of gearing to operate the shafts, and arms or cams carried by the latter to bear against the under side of the platform and elevate the latter after the knives have
15 completed the successive operations, as set forth.

20 4. In a machine for making metallic roofing, the combination, with the table and its supporting-frame, of the platform carrying hooked rods at the sides, and hooked rods at-

tached to the frame and adapted to interlock with the rods of the platform, as set forth.

5. In a machine for making metallic roofing, the combination, with the table and its supporting-frame, of the platform for clamp- 25 ing the metal against the table, devices for locking the platform down in position, shafts journaled in the supporting-frame at each side, one above the other, bending-knives secured to the shafts, gear-wheels mounted on 30 the shafts, a pinion for imparting motion to the gear-wheels, and a crank-handle for transmitting motion to the pinion, as set forth.

In testimony that I claim the foregoing as my own I have hereto affixed my signature in 35 presence of two witnesses.

FRANK AUGUSTUS GUTHRIE.

Witnesses:

W. S. MATTHEWS,
WM. A. DENNIS.