

No. 711,404.

Patented Oct. 14, 1902.

P. A. KUNOLD.
TIN FOLDING MACHINE.

(Application filed Aug. 24, 1901.)

(No Model.)

3 Sheets—Sheet I.

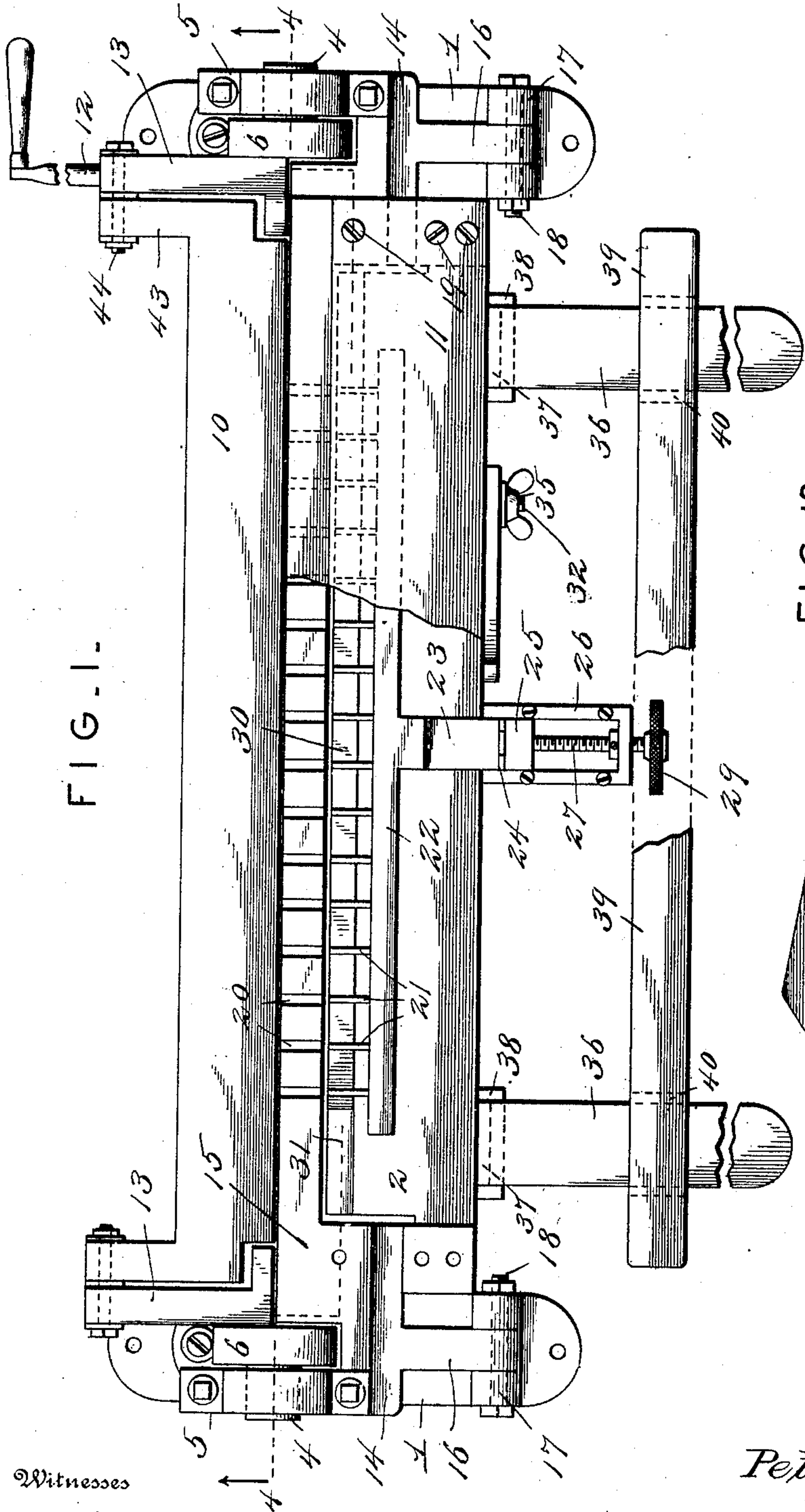


FIG. 1.

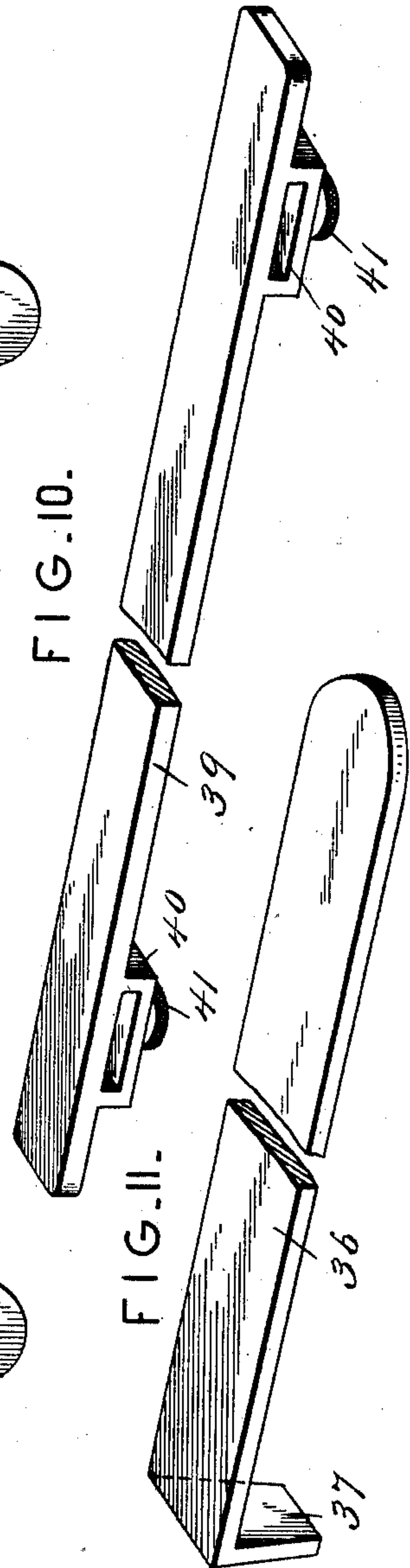


FIG. 10.

FIG. 11.

Witnesses

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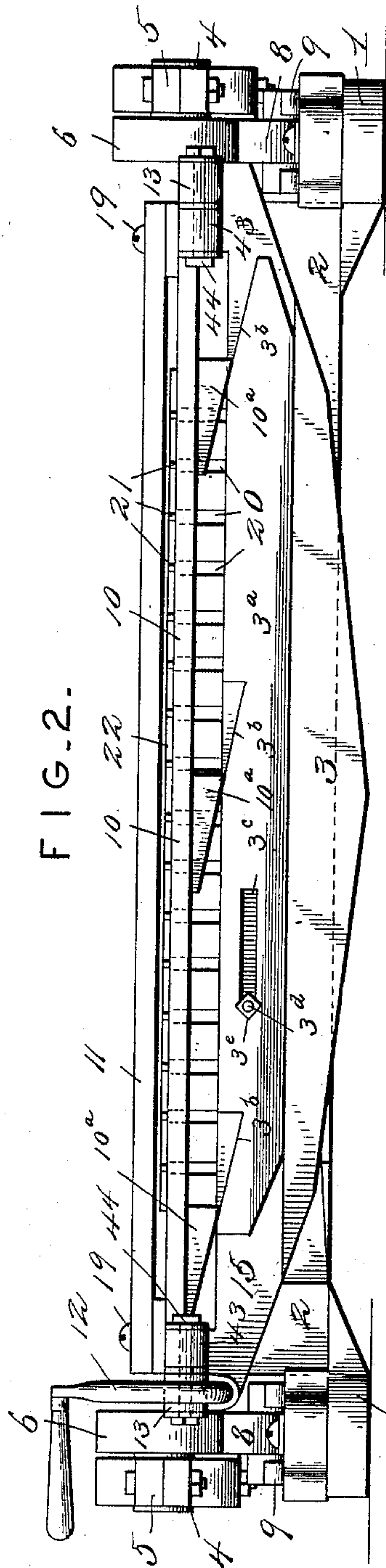
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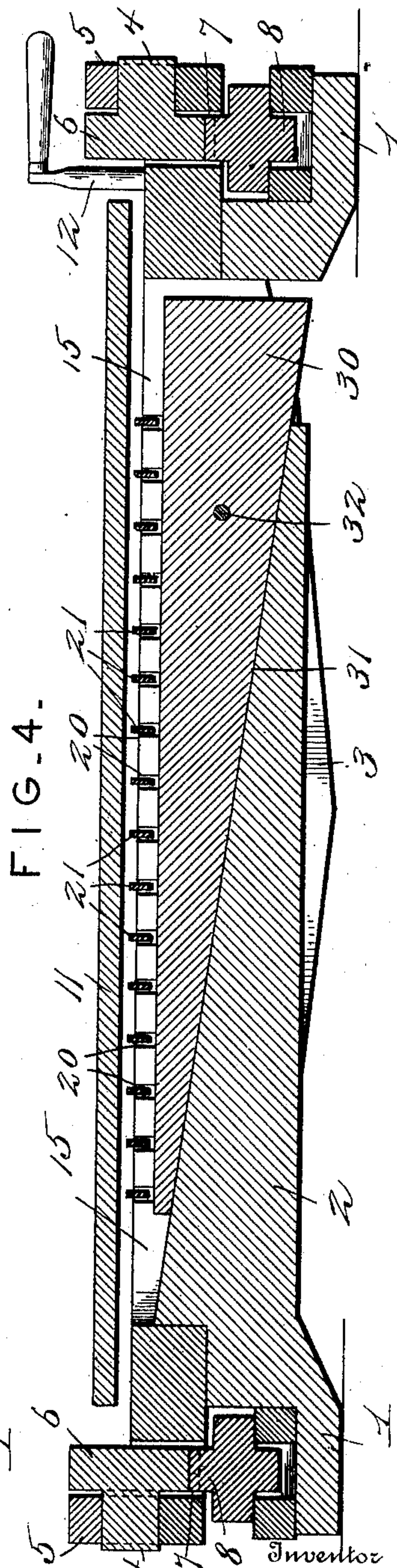
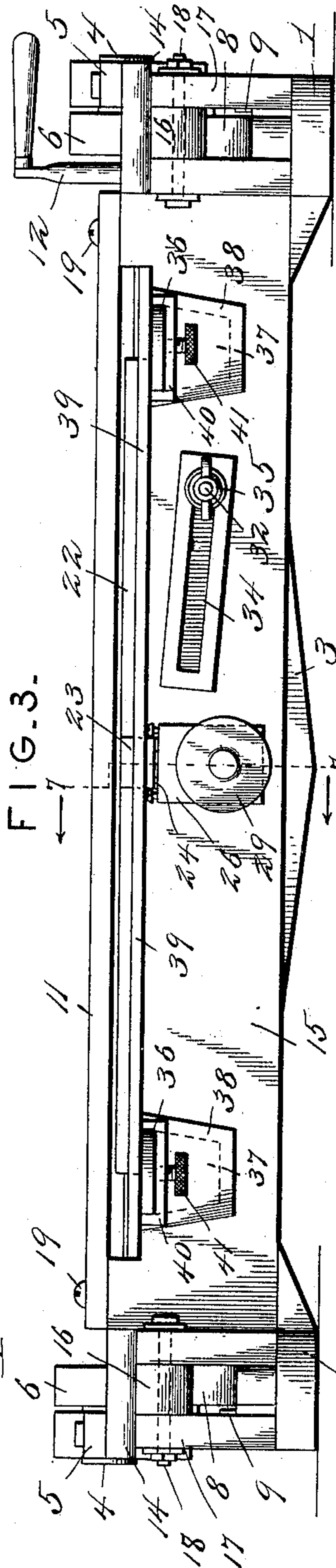
(No Model.)

3 Sheets—Sheet 2.



Witnesses

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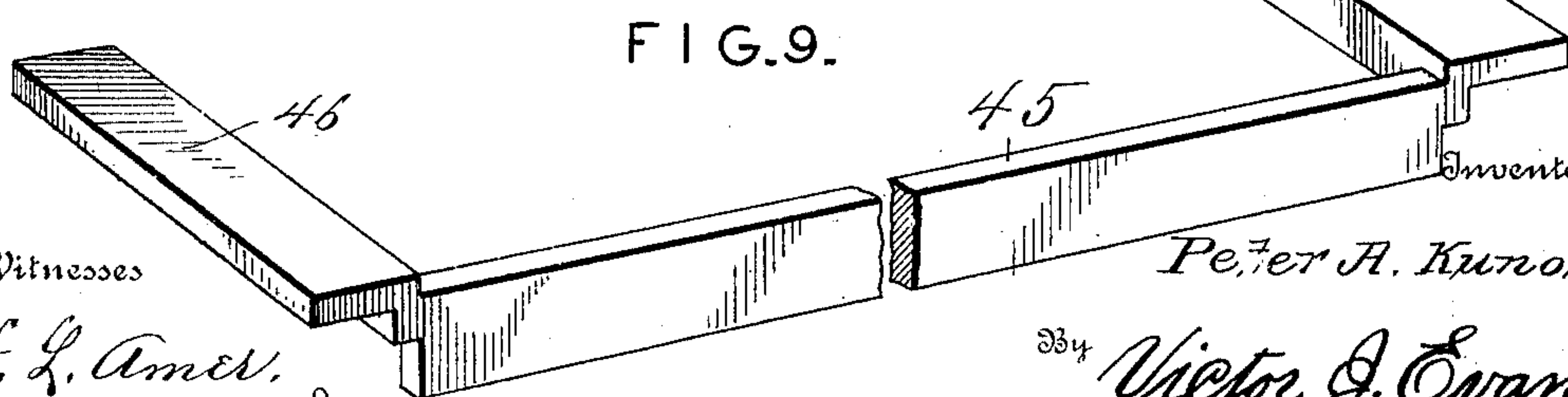
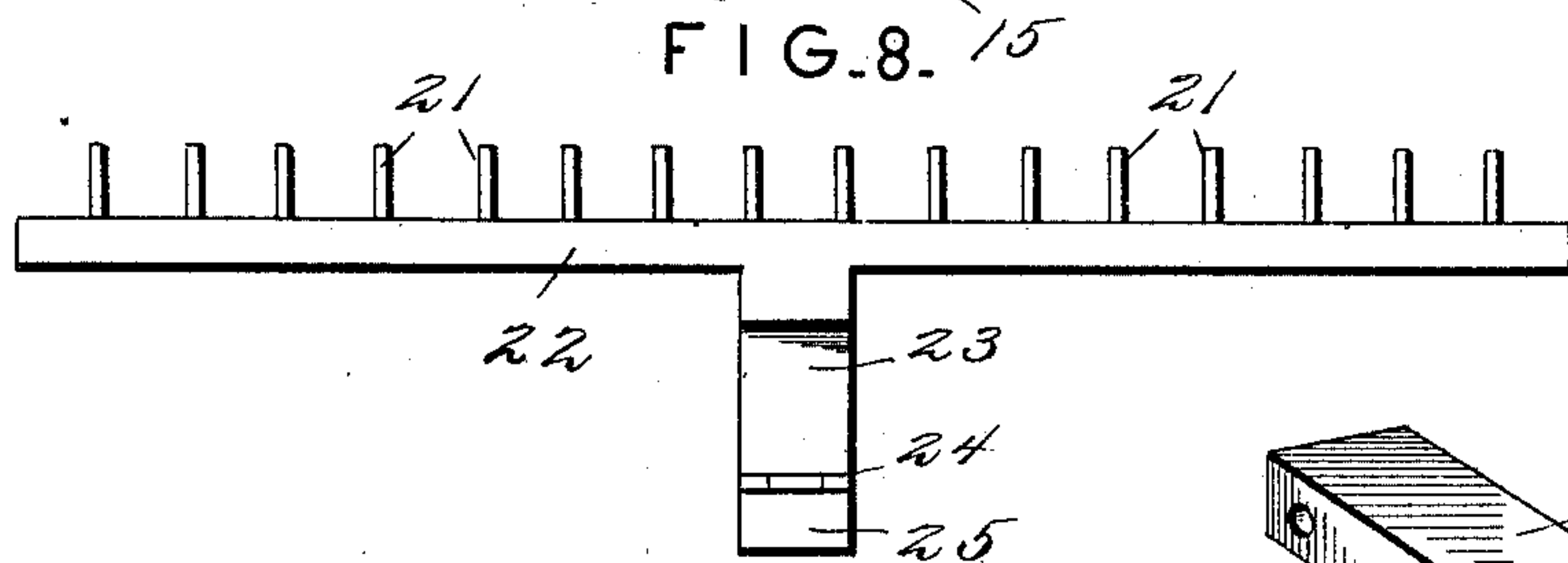
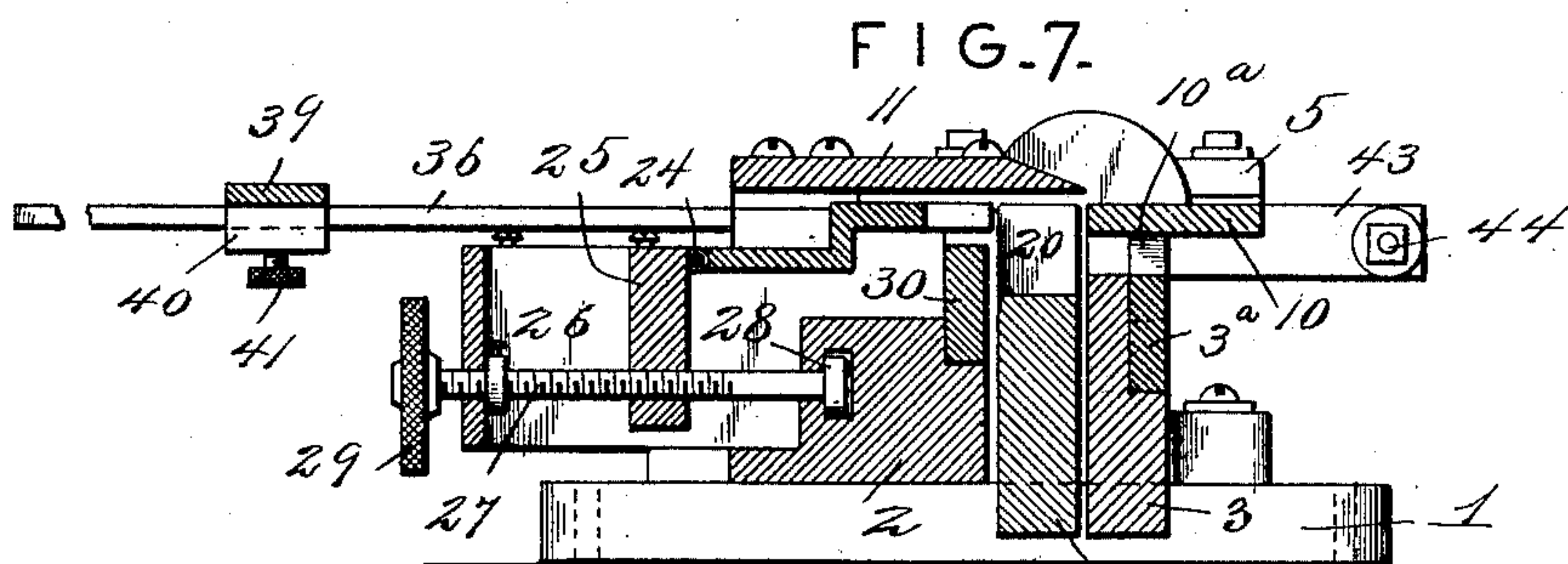
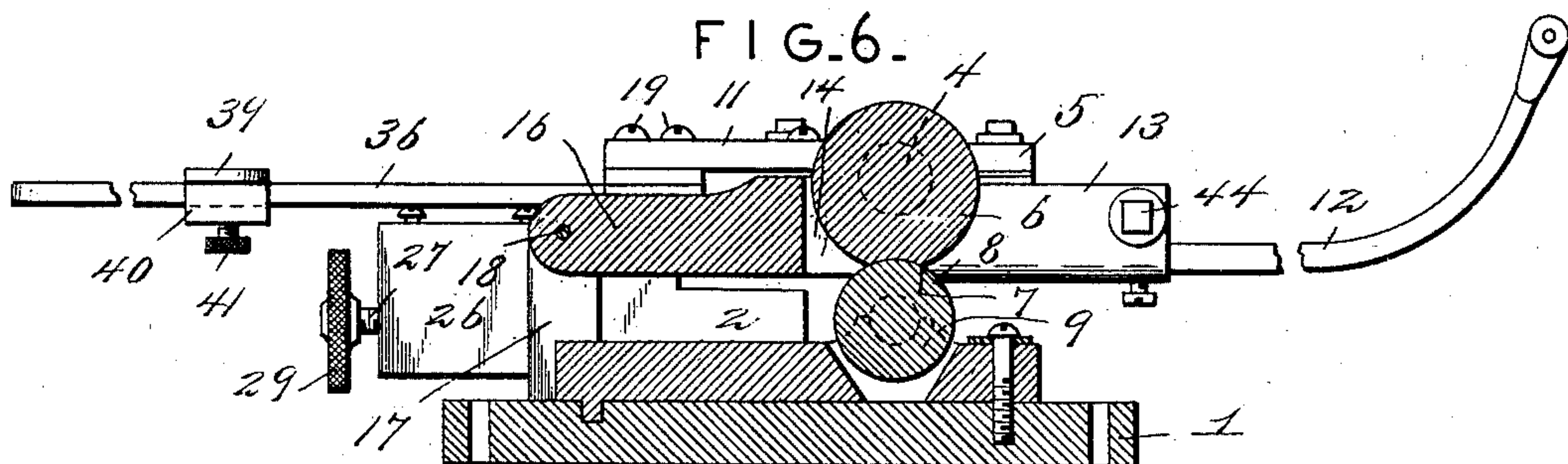
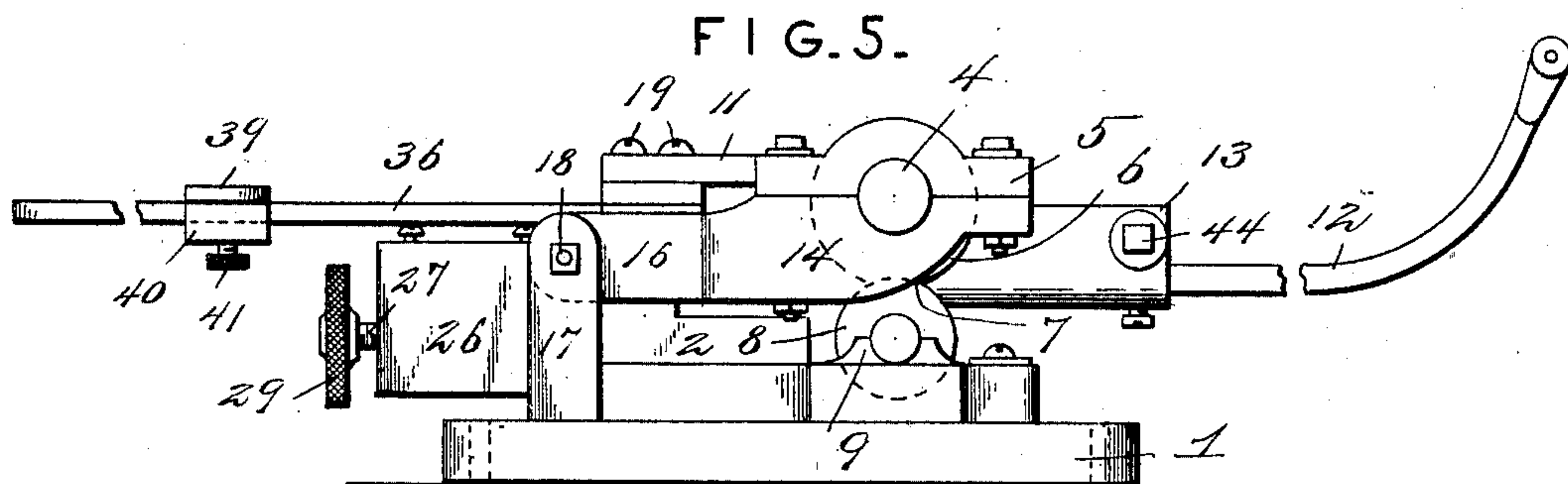
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(No Model.)

3 Sheets—Sheet 3.



Witnesses

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UNITED STATES PATENT OFFICE.

PETER A. KUNOLD, OF OMAHA, NEBRASKA.

TIN-FOLDING MACHINE.

SPECIFICATION forming part of Letters Patent No. 711,404, dated October 14, 1902.

Application filed August 24, 1901. Serial No. 73,161. (No model.)

To all whom it may concern:

Be it known that I, PETER A. KUNOLD, a citizen of the United States, residing at Omaha, in the county of Douglas and State of Nebraska, have invented new and useful Improvements in Tin-Folding Machines, of which the following is a specification.

This invention relates to tin-folding machines; and the principal object of the invention is to produce a tin-folding machine of such construction that sheets of tin of any desired size may be bent or folded at any desired distance from the edge of the sheet.

By the improved construction the sheet of metal may be held not only adjacent to its edges, but at any point in the width or length of the sheet.

It is also the object of the present invention to provide means whereby the tin may be folded around a wire or rod wherever it is necessary to reinforce the edge of a sheet of tin or other metal.

With the above and other objects in view, the nature of which will more fully appear as the description proceeds, the invention consists in the novel construction, combination, and arrangement of parts hereinafter fully described, illustrated, and claimed.

In the accompanying drawings, Figure 1 is a plan view of a metal-folding machine constructed in accordance with the present invention. Fig. 2 is a front elevation of the same. Fig. 3 is a rear elevation thereof. Fig. 4 is a vertical longitudinal section on the line 4 4 of Fig. 1. Fig. 5 is an end view of the machine. Fig. 6 is a vertical cross-section taken in line with the end rollers. Fig. 7 is a central vertical cross-section on the line 7 7 of Fig. 3. Fig. 8 is a plan view of the gage detached. Fig. 9 is a broken perspective view of the bending-bar. Fig. 10 is a perspective view of the extension gage-bar. Fig. 11 is a similar view of one of the extension-arms.

Like numerals of reference indicate like parts in all the figures.

Referring to the drawings, 1 designates the bed of the machine, which embodies the main longitudinal frame-bar 2, upon which the operative parts of the folding-machine are mounted.

3 represents the bending or folding frame, which is provided with a supporting-bar 3^a, having longitudinal wedge-shaped recesses 3^b and a slot 3^c. Through the bending-frame and through this slot extends a screw-bolt 3^d, which receives a nut 3^e, whereby the supporting-bar is held to its adjustment longitudinally of the bending-frame. The latter is provided at its opposite ends with journals 4, which are received in suitable bearings 5 on the machine-frame, the end portions of the bending-frame being also equipped with rollers 6, which are notched, as at 7, and which rest and move upon antifriction supporting-rollers 8, journaled in bearings 9 on the machine-frame. The rollers 6 are rigidly connected with the bending or folding frame, and when said frame is thrown upward in the act of bending the metal the notches 7 of the rollers 6 move out of engagement with the rollers 8, which has the effect of lifting the folding or bending frame and also lifting therewith the bending-bar 10, by means of which the metal is folded over the edge of the folding-plate 11. The bending-bar 10 is provided with depending inclined blocks 10^a, adapted to enter or leave the wedge-shaped recesses 3^b, as the supporting-bar 3^a is adjustable for the purpose of lowering or raising the bending-bar 10 with relation to the bending-frame 3.

12 designates a lever which is connected with one of the outwardly-projecting arms 13 of the bending-frame, by means of which the frame is rocked upward and downward.

The bearings 5, in which the journals 4 are mounted, are carried by the terminal arms 14 of the clamp-bar 15, and said clamp-bar is provided with a pair of rearwardly-extending arms 16, which are terminally pivoted between lugs 17 on the bed of the machine, being pivotally secured by means of bolts 18 or their equivalent. By reason of the arrangement described when the lever 12 is swung upward the rollers 6, in addition to lifting the bending-bar, also vibrate the clamp-bar 15, thus securely clamping the sheet of metal between the clamp-bar 15 and the lower side of the folding-plate 11. The folding-plate extends over the clamp-bar 15 and gage hereinafter described and has its ends secured by

means of screws or other suitable fasteners 19 to the end portions of the frame, as shown in Figs. 1, 2, and 3, the folding-plate being otherwise unattached, so as to leave a free passage for the sheet of metal between it and the gage. The clamp-bar 15 is provided in its upper edge with a series of slots 20 for the reception of a corresponding number of fingers or teeth 21 on the gage-bar 22. Said gage is arranged beneath the folding-plate 11 and is adapted to be moved transversely of the machine or toward and away from the front thereof for the purpose of gaging the width of metal to be bent or, in other words, gaging the distance of the fold from the edge of the sheet. In order to adjust said gage, the gage-bar 22 is provided with a rearwardly-extending shank 23, which is hinged at 24 to a traveler 25, mounted to move transversely of the machine in a suitable guide-frame 26. The traveler 25 is moved back and forth by means of a gage-screw 27, which has a swiveled engagement at 28 with the machine-frame and a threaded engagement with the traveler, said screw being provided at its outer end with a milled head or operating-wheel 29. The gage may be adjusted by means of the gage-screw 27, and in addition thereto the gage is adapted to rise and fall by means of its hinged connection with the traveler.

In order to elevate and lower the gage, I employ a sliding wedge 30, which is mounted in a wedge-shaped recess in the frame, the lower inclined edge of the wedge resting upon an inclined surface 31, forming the bottom or floor of the recess in the frame, as clearly shown in Fig. 4. To adjust the wedge 30, a pin or bolt 32 is connected therewith and extended laterally through an inclined slot 34 in the frame, said bolt or pin being provided at its outer end with an operating head or knob 35, having combined therewith a nut, by means of which the wedge may be fastened after it has been adjusted to the desired point. The wedge underlies the fingers of the gage, and by sliding the wedge in the proper direction the fingers may be lowered so as to leave a clear space between the gage and the folding-plate, which will admit of the sheet of metal being passed entirely through the machine without striking against the gage. In connection with the improvement just described I employ an extension-gage which comprises, essentially, a pair of extension-arms 36, extending backward from the rear of the machine and provided at their forward ends with tapered feet 37, which are detachably fitted in socket-pieces 38 on the rear of the machine-frame. This enables the extension-arms to be removed whenever they are not needed.

Extending across both of the extension-arms 36 is an extension gage-bar 39, provided on its underside with slotted extensions 40 adapted to receive the extension-arms 36. The gage-bar 39 may be fastened at any desired adjustment by means of binding-screws 41,

which pass through the extensions 40 and are adapted to impinge against the lower surfaces of the extension-arms. This permits the gage-bar to be adjusted inward and outward on the arms 36, so as to bring the edge of the sheet metal at the required distance from the edge of the folding-plate about which the metal is to be folded.

The bending-bar 10 when thrown downward lies in the proximal plane of the upper surface of the clamping-bar. The bending-bar is provided at its opposite ends with forwardly-extending arms 43, which are pivotally connected by bolts 44 with the arms 13, hereinbefore described. The bending-bar 10 (illustrated in Fig. 1) is especially adapted for making a simple fold in the sheet metal in one direction; but where the metal is to be corrugated or reversely folded alternately, a modified bending-bar, such as shown in Fig. 9, may be substituted for the bar shown in Fig. 1, the said substitute bar comprising a main body portion 45 and the terminal forwardly-extending arms 46, which are adapted to take the same pivotal bolts 44, above referred to.

In operation a sheet of metal is inserted under the folding-plate 11 and over the bending-bar until its edge strikes against the gage-bar 22 or the extension-gage 39, as the case may be. Where the extension-gage is brought into use, the usual gage may be dropped or lowered sufficiently to enable the sheet of metal to pass over the same in order to reach the extension gage-bar. It will also be seen that said extension gage-bar may be readily adjusted so as to cause the fold in the metal to come any desired distance from the edge of the metal sheet. This adds greatly to the utility and capacity of the machine. When it is practicable to use the ordinary gage, the latter may be elevated into operative position by means of the sliding wedge. After the proper gage has been adjusted and the sheet inserted the handle 12 is rocked upward, thereby swinging the bar 10 and bending the metal against and around the beveled or sharpened edge of the folding-plate 11 in a manner well understood by those familiar with the art to which this invention appertains. Where it is desired to reinforce the edge of the metal sheet, this may be accomplished by laying sections of rods or wire upon the edge portion of the metal and bending or rolling said edge thereover.

In order to form a round bend in the metal for the reception of a rod or wire, the bending-bar 45 is adjusted to the machine and brought into use. In order to accomplish this, the sliding wedge is first lowered, after which the bar 45 is placed in position. The bend is partially made in the metal, and the wire or rod is laid in such bend, and afterward the bending of the metal is completed, so as to inclose such wire or rod.

I do not desire to be limited to the details of construction hereinabove set forth, and

accordingly reserve the right to change, modify, or vary the construction within the scope of the appended claims.

5 Having thus described the invention, what is claimed, and desired to be secured by Letters Patent, is—

1. In a metal-folding machine, the combination with the machine-frame; of a gage adapted to rise and fall, and a sliding wedge
10 mounted beneath the gage and forming a movable support therefor.

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

nation with the machine-frame; of a horizontally-adjustable gage adapted to rise and fall, a wedge operating beneath the gage for raising and lowering the same, and a wedge operating and fixing device working in an inclined slot in the machine-frame. 15

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

PETER A. KUNOLD.

Witnesses:

CHAS. F. KRELLE,

JAS. A. O'CONNOR.