June 19, 1923. 1,459,224

T. LENNOX

MACHINE FOR FORMING SHEET METAL BASKETS

Filed Dec. 6, 1920 3 Sheets-Sheet 1

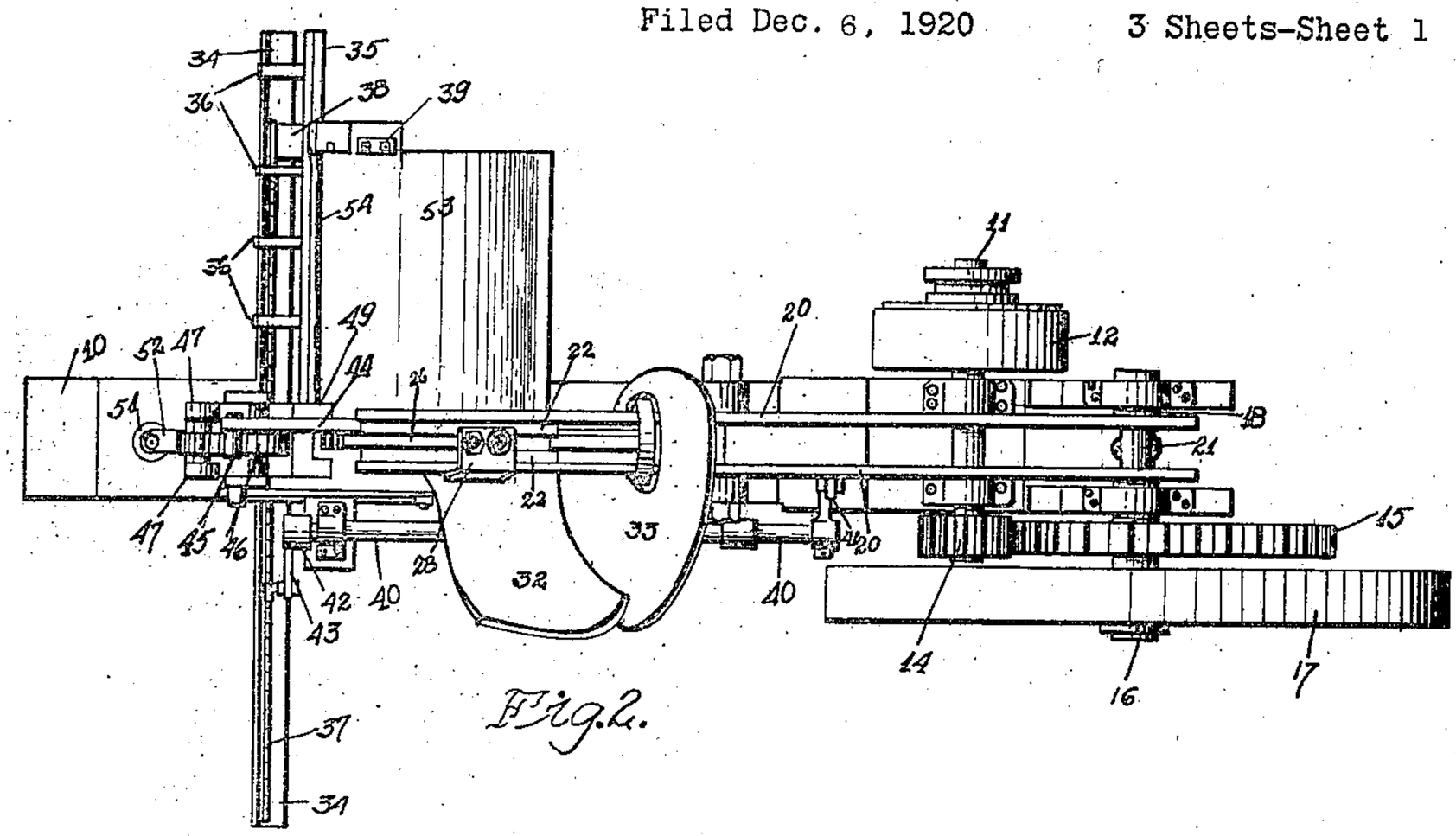

Fig. 2.

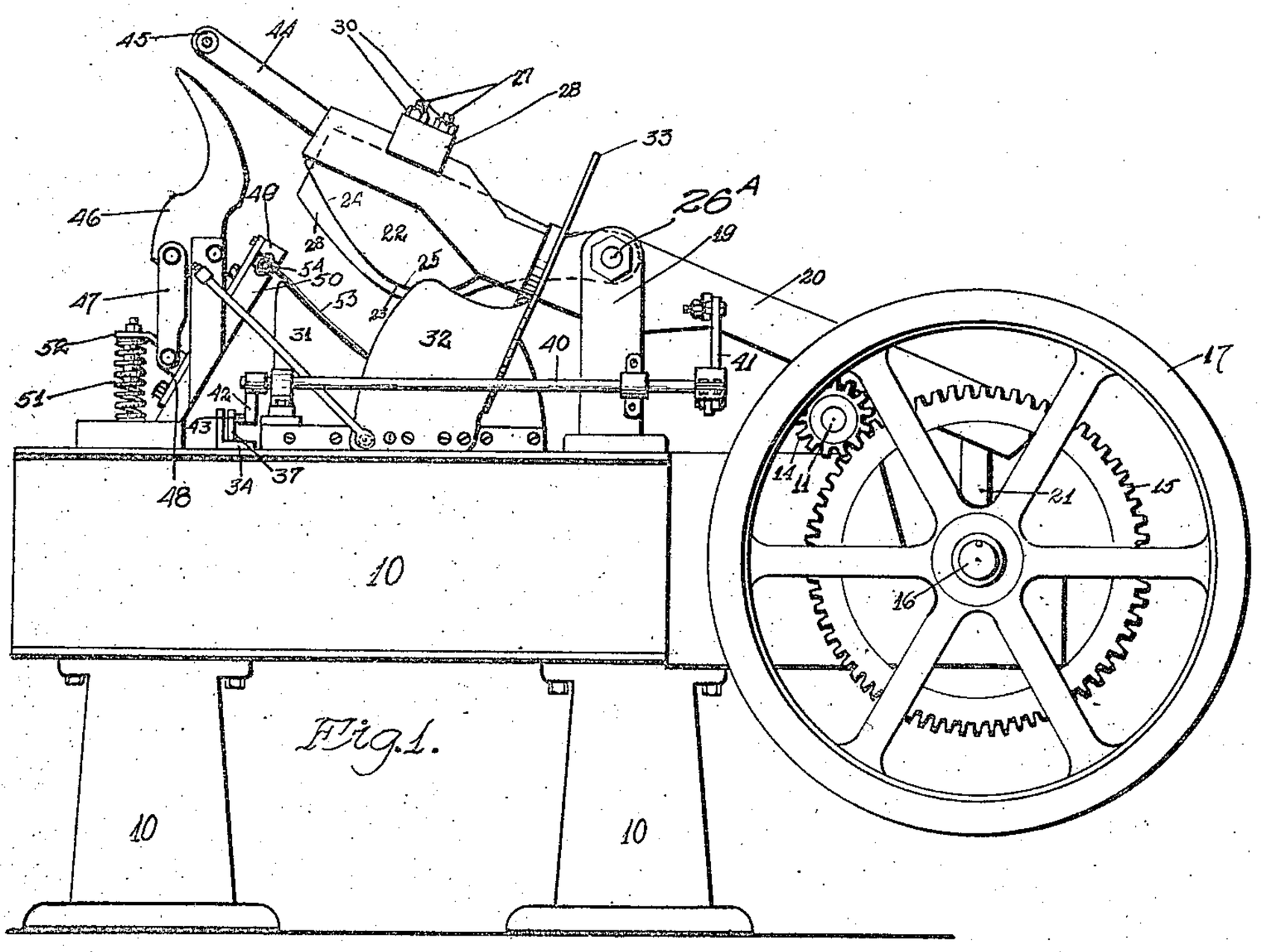

Fig. 1.

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MACHINE FOR FORMING SHEET METAL BASKETS

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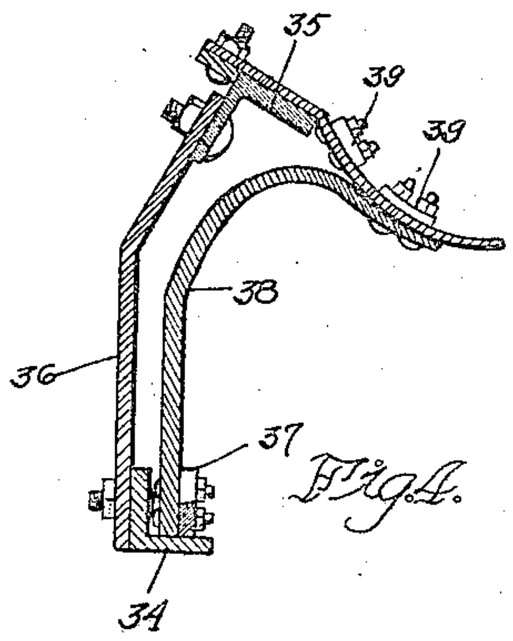

Fig. 4.

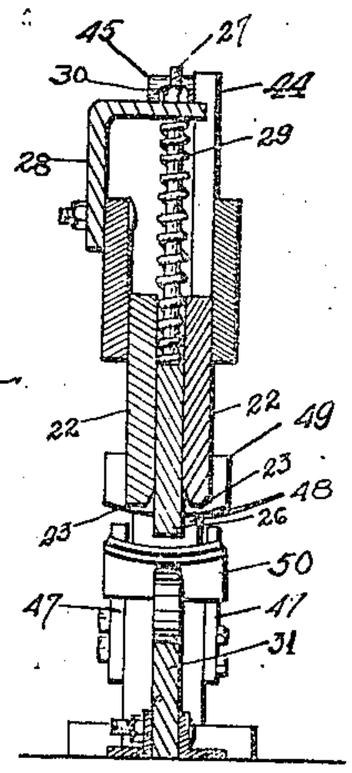

Fig. 5.

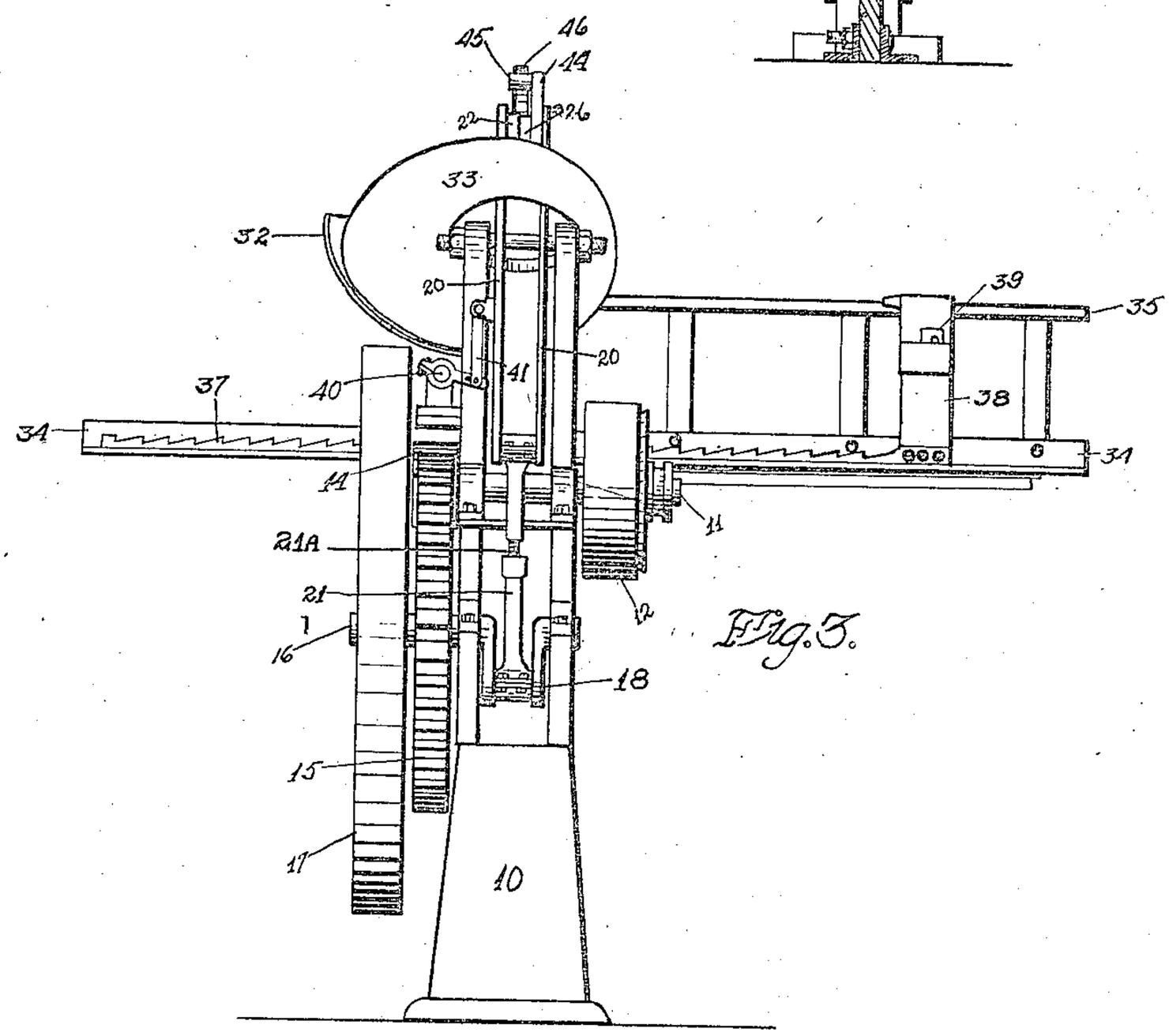

Fig. 3.

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MACHINE FOR FORMING SHEET METAL BASKETS

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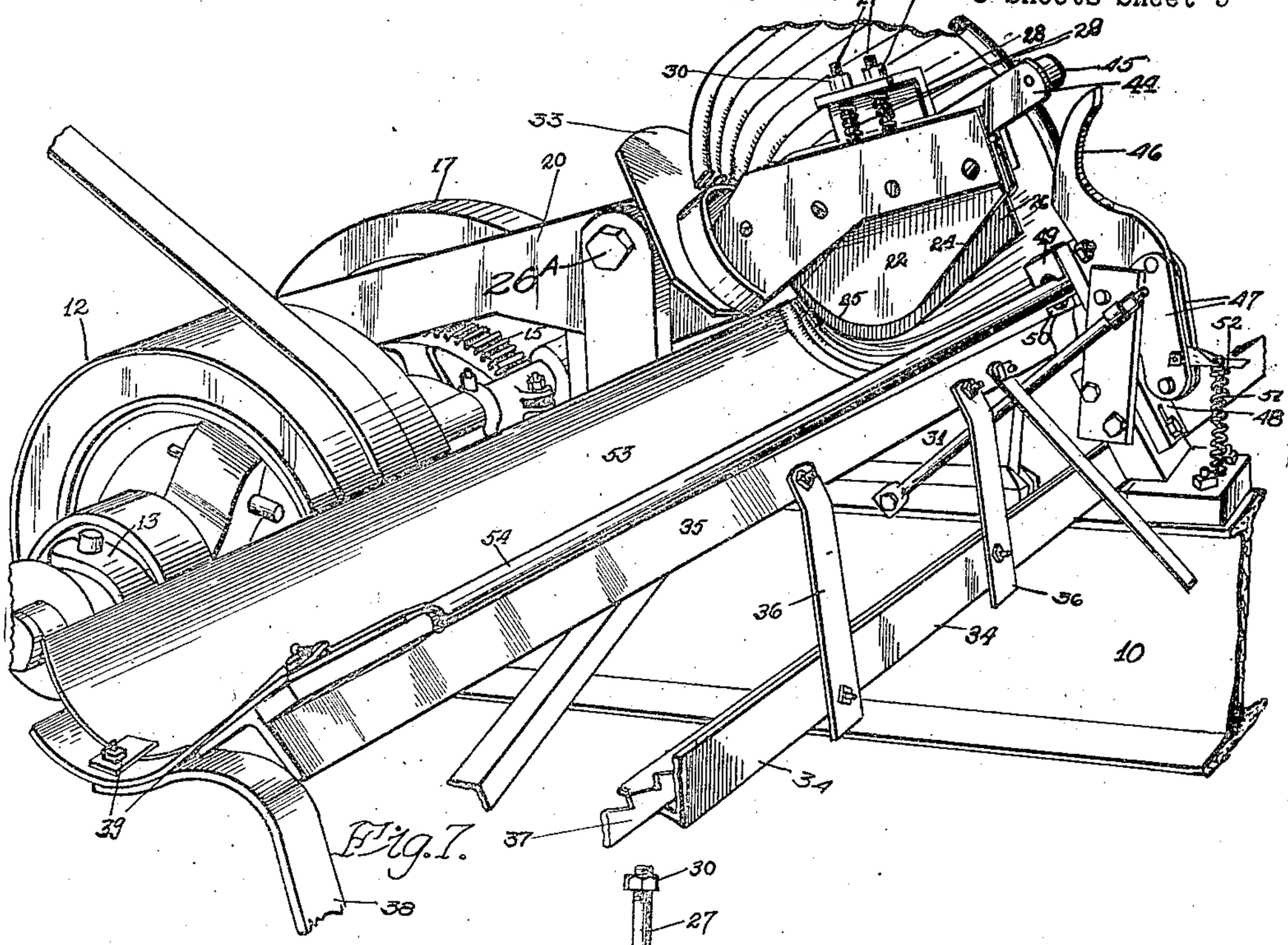

Fig. 1.

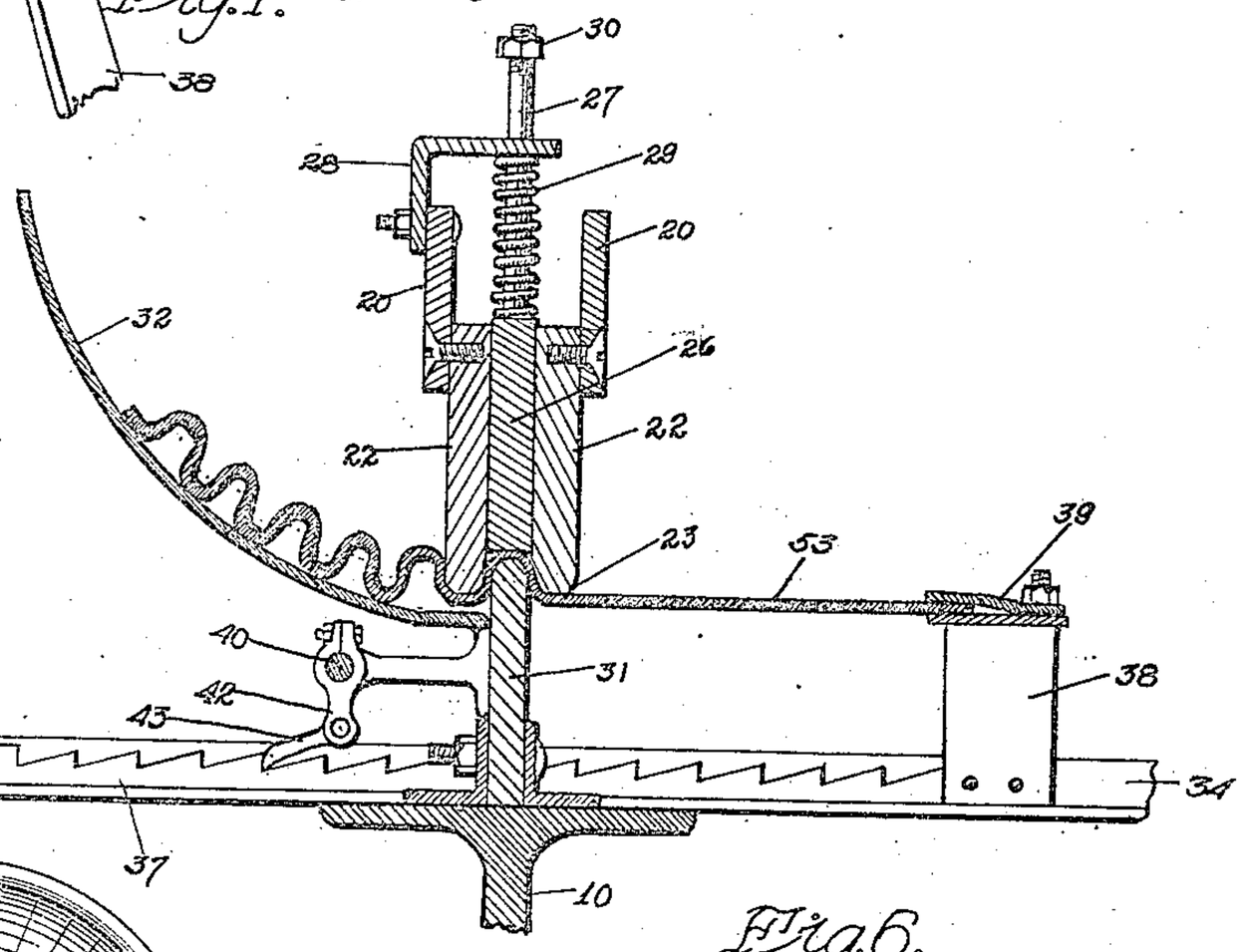

Fig. 6.

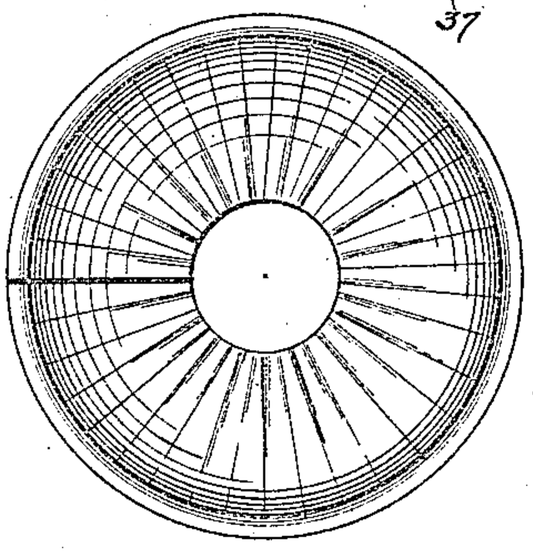

Fig. 8.

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Patented June 19, 1923. 1,459,224

UNITED STATES PATENT OFFICE.

TALBOT LENNOX, OF MARSHALLTOWN, IOWA.

MACHINE FOR FORMING SHEET-METAL BASKETS.

Application filed December 6, 1920. Serial No. 428,715.

To all whom it may concern:

Be it known that I, TALBOT LENNOX, a citizen of the United States, and resident of Marshalltown, in the county of Marshall and State of Iowa, have invented a certain new and useful Machine for Forming Sheet-Metal Baskets, of which the following is a specification.

The object of my invention is to provide a machine of simple, durable and inexpensive construction, especially designed for forming corrugated, reinforced baskets from sheet metal.

A further object is to provide improved means for automatically forming the reinforcing ribs in the body portion of the basket, and for tapering said ribs from a maximum thickness from the bottom center of the basket to a minimum near the top of the basket, for the double purpose of giving the proper curvature to the basket when formed and for giving additional strength to the basket at the point where the greatest strains occur, and more specifically in this connection it is my object to provide a machine of this kind by which the reinforcing ribs may be extended to a point closer to the center of the bottom of the basket than has been possible with machines for this purpose heretofore in use.

A further object is to provide means for automatically gripping the basket and firmly holding it in position during the time that each rib is being formed, and for automatically releasing it and then advancing it one rib space to position ready for the next rib bending operation.

A further object is to provide improved and simplified means for automatically forming the basket in the desired shape during the operation of forming the ribs, so that as soon as the ribs are formed the basket will be properly shaped.

My invention consists in the construction, arrangement and combination of the various parts of the device, whereby the objects contemplated are attained, as hereinafter more fully set forth, pointed out in my claims, and illustrated in the accompanying drawings, in which:

Figure 1 shows an end elevation of a machine embodying my invention.

Figure 2 shows a top or plan view of same.

Figure 3 shows a front elevation of same.

Figure 4 shows an enlarged, vertical transverse sectional view through the movable frame in which the sheet metal to be formed into a basket is clamped.

Figure 5 shows a vertical, transverse sectional view through the rib forming devices.

Figure 6 shows an enlarged, detail sectional view illustrating the stationary rib forming member and the opposed movable rib forming member, with a partly formed basket therein, and also the means for advancing material one rib space after each rib forming operation.

Figure 7 shows a perspective view of the upper portion of my improved machine, with a partially formed basket therein as in use; and

Figure 8 shows a top or plan view of a basket of the kind produced by my improved machine, the bottom member being omitted.

Referring to the accompanying drawings, I have used the reference numeral 10 to indicate the machine base. Mounted at the rear of the base is a driving shaft 11, on which is mounted a pulley 12 which is provided with a clutch 13, partly illustrated in Figure 7, and of the ordinary kind. Fixed to this shaft 11 is a small pinion 14 in mesh with a large pinion 15 on the main shaft 16. This main shaft carries a balance wheel 17 and is provided with a crank arm 18, as shown in Figure 3, whereby when the pulley is operated the crank arm 18 will be driven at a reduced speed.

Mounted upon the base 10 is a standard 19, to which is fulcrumed the main operating lever 20. This lever is preferably formed of two side members spaced apart from each other. At the rear this lever is connected to a pitman 21, adjustable as to length by the screw and socket joint 21A, which pitman is connected to the crank 18 so that the lever is reciprocated during the operation of the driving shaft.

Fixed to the forward end of the reciprocating lever 20 are two rib forming plates 22, spaced apart from each other and each having its lower edge rounded at 23. These plates 22 are also shaped as follows: The forward portion has a straight portion at 24, as shown in Figure 7, and a rounded rear portion at 25, the shape being substantially that to which it is desired to bend the body portion of the metal basket. Between these two plates 22 is a third rib forming plate 26, pivoted at one end to the fulcrum bolt 26A

of the lever 20 as shown by dotted lines in Figure 1 and slidingly supported upon two rods 27 which are fixed to the rib forming plate 26 and extending upwardly through openings in a bracket 28 on the lever 20, and coil springs 29 are mounted on these rods 27 between the bracket 28 and the plate 26, and yieldingly hold the plate 26 to its limit of movement downwardly, the said movement being limited by the adjustable nuts 30 on the rods 27. The edge of this central plate 26 is preferably straight and at right angles to the sides, and the shape of the body of the plate 26, as viewed from one side, is substantially the same as that of the adjacent plates 22, except that the former portion projects farther from the lower edges of the plates 22 than it does at the rear portion when the said plate 26 is in its extended position, as shown in Figure 7. The purpose of this will be hereinafter set forth.

Mounted on the base 10, immediately beneath the rib forming plate 26, is a stationary coacting rib forming plate 31, the top of which in cross section is rounded, as shown in Figure 6.

To aid in forming the basket in the rounded shape after the ribs have been formed therein, and also for holding it in position on the machine, I have provided a stationary curved forming plate 32, the upper edge of which is substantially segmental in shape and so arranged as to cause the material after it has been formed with ribs to curve in substantially the same arc as that of the basket to be formed. Adjacent to the curved forming plate 32 is a substantially disc-shaped plate 33, also fixed in position and having a central opening through which the lever 20 is extended and may operate. This latter plate is designed to engage the bottom of the basket being formed, and to support it in position.

In order to support the material of which the basket is being formed, and also to advance the material step by step as the ribs are being formed, I have provided the following mechanism:

Extended across the forward part of the machine frame are the two angle bar frame members 34 and 35, connected by suitable braces 36. These parts are rigidly secured in position on the frame of the machine. Slidingly mounted in the angle bar 34 is a rack bar 37. On one end of it is an upright 38, and on the top of the upright are two clamp devices 39, designed to receive one edge of the metal of which the basket is to be formed. Mounted on the machine frame is a rock shaft 40, having at one end a crank arm 41 connected to the lever 20 and at its other end a crank arm 42 to which a pawl 43 is connected. This pawl engages the rack 37.

The operation of this part of the device is as follows: Each time that the lever 20 moves upwardly to form a rib in the basket, the shaft 40 is rocked and the pawl 43 moved to advance the rack bar 37 a distance corresponding to the width of one rib in the basket to be formed.

In forming the ribs in the basket, it is necessary that the basket forming metal be firmly clamped and held when the rib is being formed, and also that it be released for its sliding movement after the rib has been formed. To provide means for accomplishing this result I equip the outer end of the lever 20 with an extension 44 on which there is a roller 45, and supported on the machine frame is a pivoted cam lever 46, arranged in the path of said roller 45 so that during the downward movement of the lever 20 the cam lever 46 will be moved. Pivoted to the cam lever 46 is a link 47, which link is attached to a sliding plate 48, which plate has a clamping jaw 49 at its upper end, designed to engage the rib at the top of the basket forming metal. Opposed to this jaw 49 is a stationary clamping jaw 50 to engage the under side of said rib.

In order to hold the cam lever 46 in its normal position, and also to open the clamping jaw 49, I have provided an extensible coil spring 51, with its lower end engaging the machine frame and its upper end engaging an arm 52 on the sliding plate 48, said spring exerting an upward pressure on said arm 52.

The operation is as follows: During the downward movement of the lever 20 the cam lever 46 is operated to move the sliding plate 48 downwardly, thus bringing the clamping jaw 49 toward the stationary clamping jaw 50, the two jaws engaging the rolled rim of the basket forming material between them and holding it stationary during the rib forming stroke of the machine. Then during the upward stroke of the lever 20 the basket making material is advanced one rib space, as before described.

In the drawings the basket making material is indicated by the numeral 53, and before placing it in position on the machine one longitudinal edge thereof is provided with a roll 54, which forms the top reinforced edge of the basket, and the body portion is curved as shown in Figure 7. This sheet of material is placed on the machine and held in position by the clamps 39.

In practical use it will be noted that the operation of the machine after the sheet metal material is clamped in position, is entirely automatic. When the lever 20 moves downwardly the yielding rib forming plate 26 first engages the metal and holds it firmly against the stationary rib forming plate 31. Then as the lever 20 continues to move, the two rounded rib forming plates 22 then engage the metal and bend it around the

stationary rib forming plate 31. This movement prevents the metal from wrinkling and holds all of the parts firmly together during the rib forming operation, and at the same time enables the operator to form much deeper ribs without wrinkling than can be formed with the ordinary rib forming mechanisms now in use. During the rib forming process the metal is firmly held by the clamping jaws 49 and 50, and as soon as the ribs have been formed these jaws are automatically released so that the material may be advanced.

One of the important features of my invention is in connection with this movement advancing the material. Referring to Figure 6, it will be seen that after the rib has been formed the stationary plate 31 projects up into the rib, and in order to advance the material it is necessary to raise the material above the rib 31. In my device this is accomplished readily and easily, because after the lever 20 has been raised the end of the basket material that is resting upon the curved forming plate 32 tends to cause the material adjacent to the stationary plate 31 to spring upwardly, thus clearing the stationary plate 31 and permitting the material to advance.

Furthermore, the spring actuated plate 26 performs another advantageous function, because when the lever 20 begins its upward movement the rib just formed in the basket material would tend to stick tightly between the rib forming plates 22. This, however, is prevented by the spring actuated plate 26, and the entire upper rib forming mechanism is thereby freely separated from the basket making material.

I claim as my invention:

1. In a rib forming mechanism for sheet metal articles, the combination of two rib forming devices, one being capable of movement toward the other, one of said rib forming devices comprising a single rib forming plate, and the other comprising two rib forming plates spaced apart, and a third plate between them, and a spring device applied to the said third plate to yieldingly hold it projected beyond the other two plates and to permit it to be forced back between the other two plates, all of said rib forming plates also being curved longitudinally with one end portion thereof substantially at right angles to the other.

2. In a rib forming mechanism for sheet metal articles, the combination of two rib forming devices, one being capable of movement toward the other, one of said rib forming devices comprising a single rib forming plate, and the other comprising two rib forming plates spaced apart, and a third plate between them, and a spring device applied to the said third plate to yieldingly hold it projected beyond the other two plates and to permit it to be forced back between the other two plates, means for advancing sheet metal material between the rib forming devices when they are separated, and a guide plate against which the material is forced when thus advanced, said guide plate being positioned and shaped to raise the material away from the single rib forming plate to permit such advance.

3. In a rib forming mechanism for sheet metal articles, the combination of two rib forming devices, one being capable of movement toward the other, one of said rib forming devices comprising a single rib forming plate, and the other comprising two rib forming plates spaced apart, and a third plate between them, a spring device applied to the said third plate to yieldingly hold it projected beyond the other two plates and to permit it to be forced back between the other two plates, all of said rib forming plates also being curved longitudinally with one end portion thereof substantially at right angles to the other, means for advancing sheet metal material between the rib forming devices when they are separated, and a guide plate against which the material is forced when thus advanced, said guide plate being positioned and shaped to raise the material away from the single rib forming plate to permit such advance.

4. In a rib forming mechanism for sheet metal articles, the combination of two rib forming devices, one being capable of movement toward the other, one of said rib forming devices comprising a single rib forming plate, and the other comprising two rib forming plates spaced apart, and a third plate between them, a spring device applied to the said third plate to yieldingly hold it projected beyond the other two plates and to permit it to be forced back between the other two plates, all of said rib forming plates being curved longitudinally, and means for clamping sheet metal material in position to be operated on by the rib forming devices, said means being automatically operated to clamp during the movement of the rib forming devices toward each other.

5. In a rib forming mechanism for sheet metal articles, the combination of two rib forming devices, one being capable of movement toward the other, one of said rib forming devices comprising a single rib forming plate, and the other comprising two rib forming plates spaced apart, and a third plate between them, a spring device applied to the said third plate to yieldingly hold it projected beyond the other two plates and to permit it to be forced back between the other two plates, all of said rib forming plates being curved longitudinally, means for clamping sheet metal material in position to be operated on by the rib forming devices, said means being automatically operated to

clamp during the movement of the rib forming devices toward each other, and spring actuated means for releasing said clamp during the separating movement of the rib forming devices.

6. In a rib forming mechanism for sheet metal articles, the combination of two rib forming devices, one being capable of movement toward the other, one of said rib forming devices comprising a single rib forming plate, and the other comprising two rib forming plates spaced apart, and a third plate between them, a spring device applied to the said third plate to yieldingly hold it projected beyond the other two plates and to permit it to be forced back between the other two plates, and means for clamping sheet metal material in position to be operated on by the rib forming devices, said means being automatically operated to clamp during the movement of the rib forming devices toward each other, said means comprising a stationary jaw designed to engage the sheet metal material, a movable jaw opposed to the stationary jaw, a sliding plate to which the movable jaw is attached, a cam device for operating the plate in one direction, a spring for moving the plate in the opposite direction, and an arm carried by the movable rib forming device to engage and operate said cam.

7. In a machine of the class described, the combination of a lever, means for oscillating it, a rib forming device carried by the lever, a stationary coacting rib forming device, a movable sheet metal material supporting frame extending transversely between said rib forming devices, means actuated by said lever for advancing the said movable frame during that part of the movement of the lever when the rib forming devices are separated, and means for clamping the sheet metal material firmly in position, said means actuated by the said lever during its movement for bringing the rib forming devices together.

8. In a machine of the class described, the combination of a lever, means for oscillating it, a rib forming device carried by the lever, a stationary coacting rib forming device, a movable sheet metal material supporting frame extending transversely between said rib forming devices, means actuated by said lever for advancing the said movable frame during that part of the movement of the lever when the rib forming devices are separated, means for clamping the sheet metal material firmly in position, said means actuated by the said lever during its movement for bringing the rib forming devices together, and a stationary guide plate designed to be engaged by the material after it has passed through between the rib forming devices, said guide plate being so positioned as to cause the sheet metal material to elevate out of engagement with the stationary rib forming device when the sheet metal material is being advanced.

9. In a machine of the class described, the combination of a lever, means for oscillating it, a rib forming device carried by the lever, a stationary coacting rib forming device, a movable sheet metal material supporting frame extending transversely between said rib forming devices, means actuated by said lever for advancing the said movable frame during that part of the movement of the lever when the rib forming devices are separated, means for clamping the sheet metal material firmly in position, said means actuated by the said lever during its movement for bringing the rib forming devices together, a stationary guide plate designed to be engaged by the material after it has passed through between the rib forming devices, said guide plate being so positioned as to cause the sheet metal material to elevate out of engagement with the stationary rib forming device when the sheet metal material is being advanced, and a stationary guide plate to receive and support the material after it has been passed through between the rib forming plates, said latter plate having an opening through it through which the lever is projected.

Des Moines, Iowa, October 12, 1920.

TALBOT LENNOX.