

May 13, 1924.

1,493,965

L. E. CURTIS ET AL

EXPANDED METAL MACHINE

Filed Dec. 8 1922

5. Sheets-Sheet 1

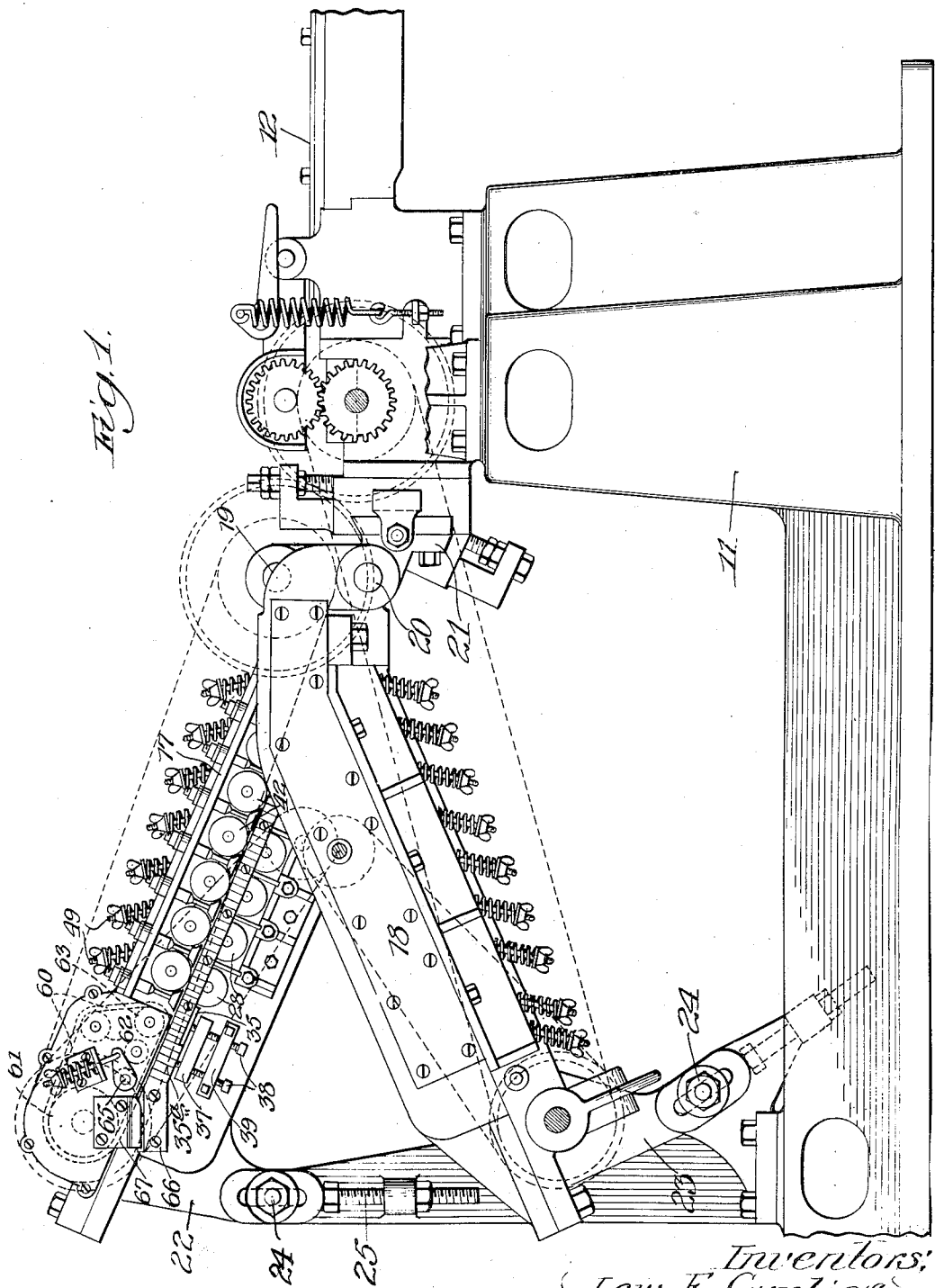


Fig. 1.

Inventors:
Lew E. Curtis &c
John Manofsky,
By *George F. Smith, Attorney at Law*
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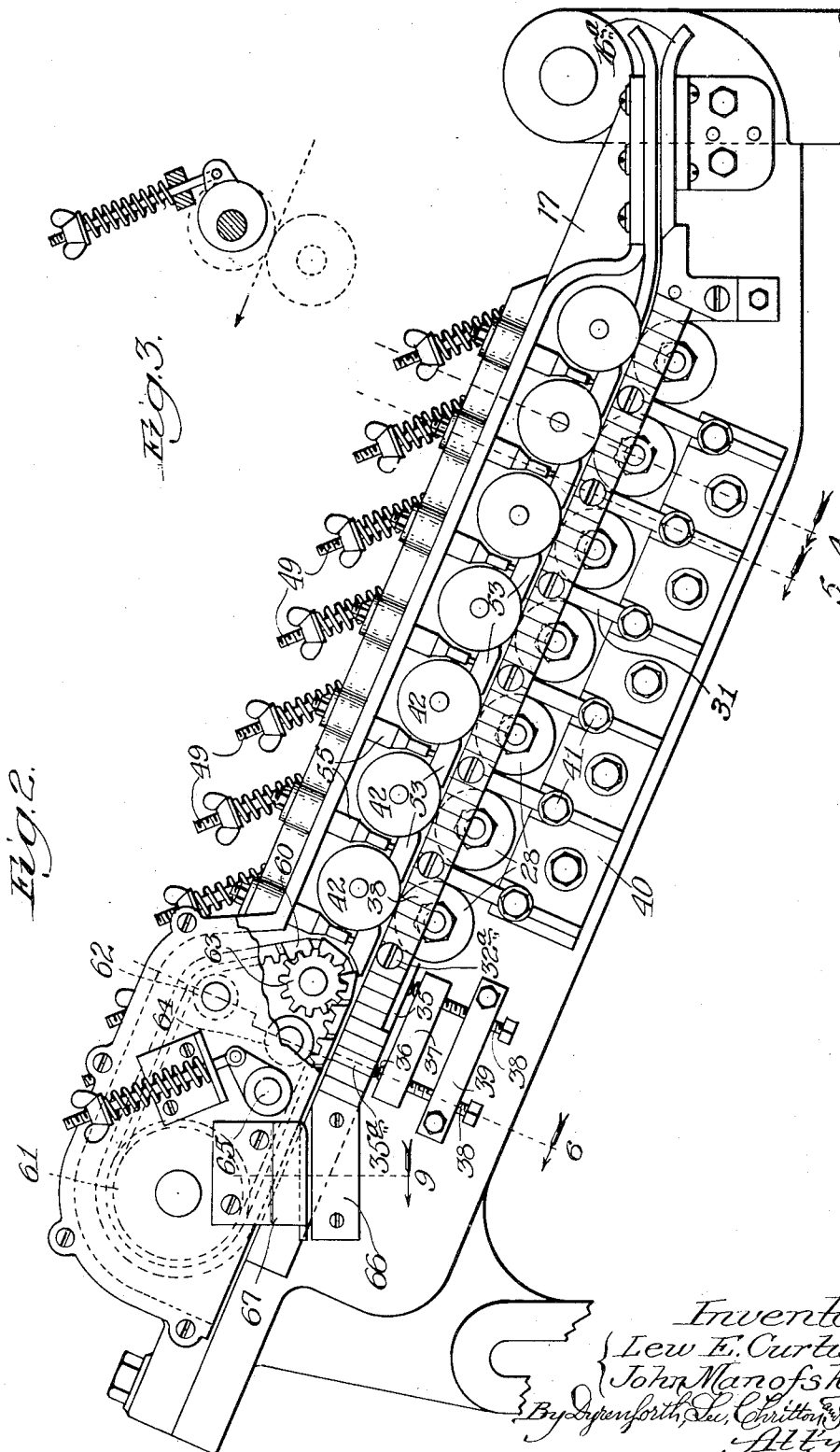
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Fig. 5.

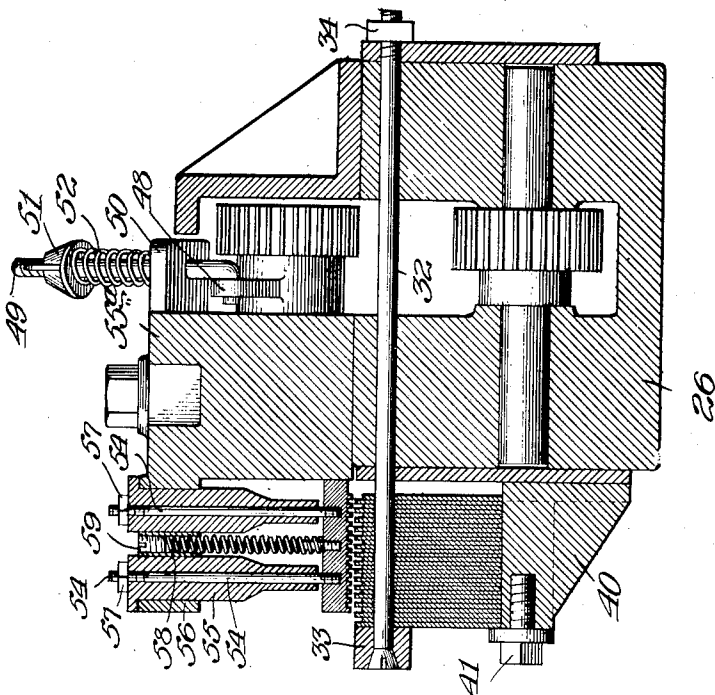
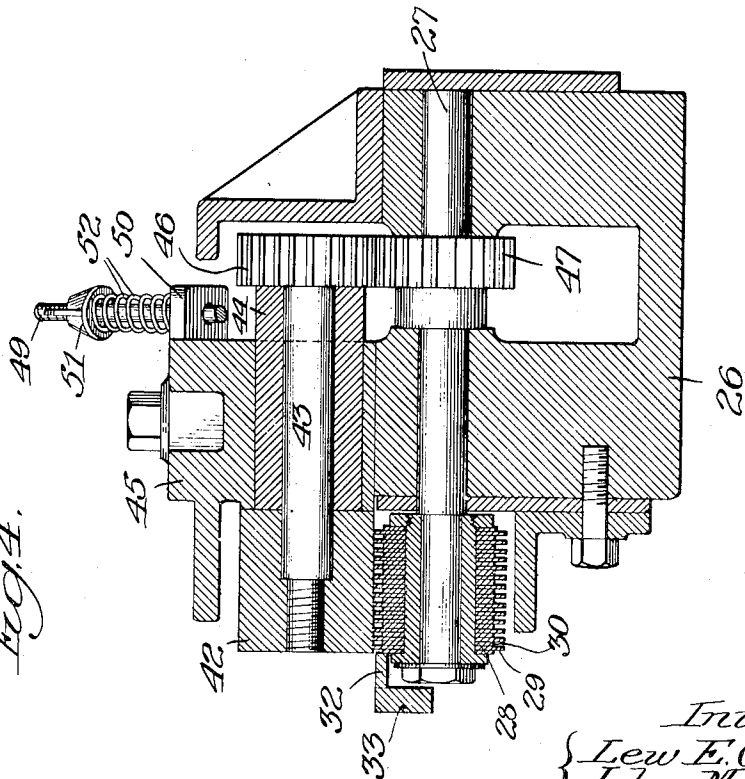


Fig. 4.



Inventors:
Lew E. Curtis,
John Manofsky,
By *Byrd, Green, Smith, & Co.,*
Attys.

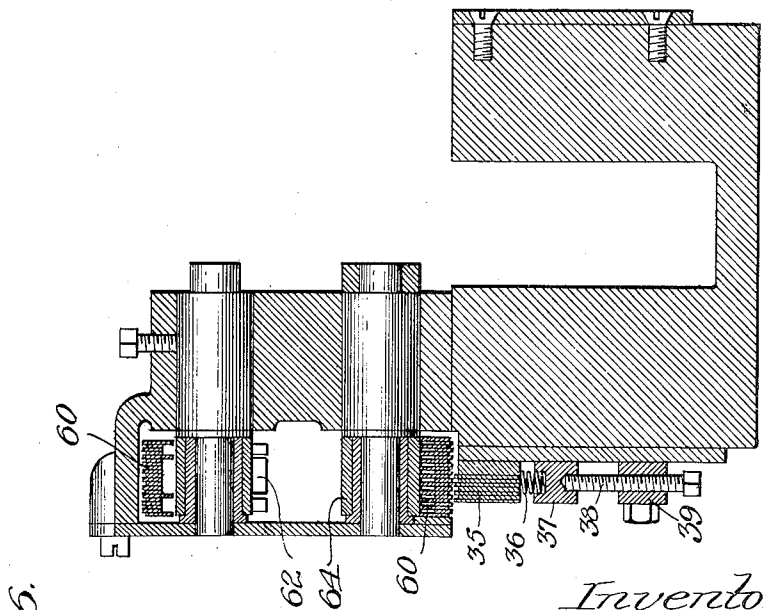
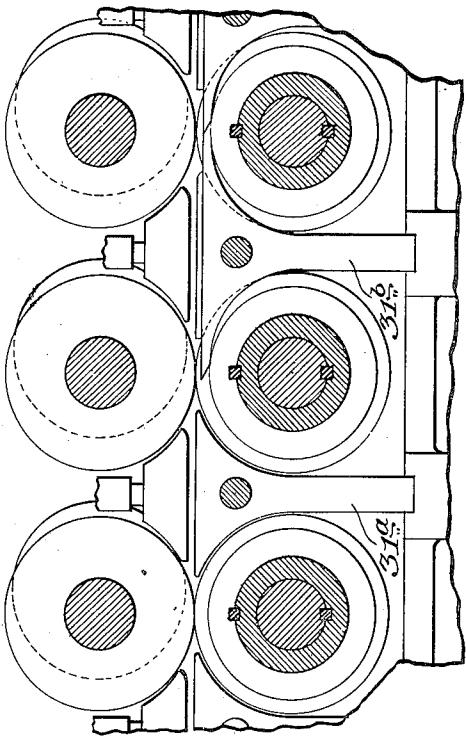
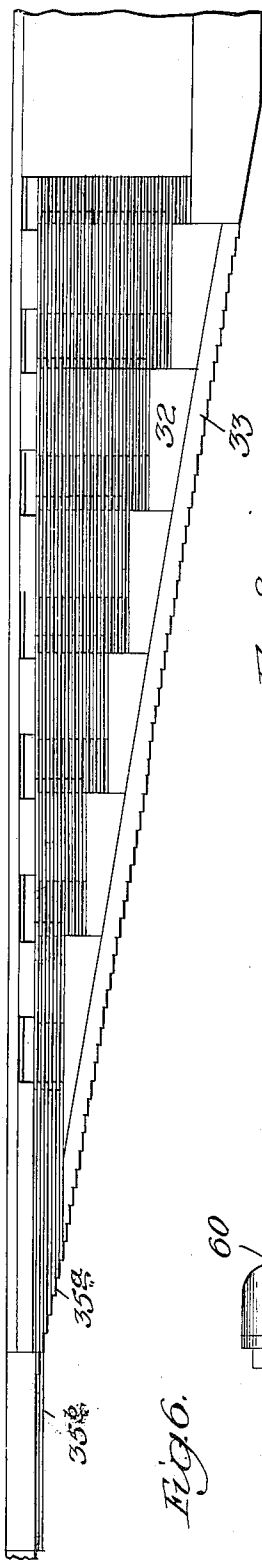
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5 Sheets-Sheet 4



Inventors:
Lew E. Curtis
John Manofsky
By *Byrdyemforth, Lee, Curtis & Wiles*
Attorneys

May 13, 1924.

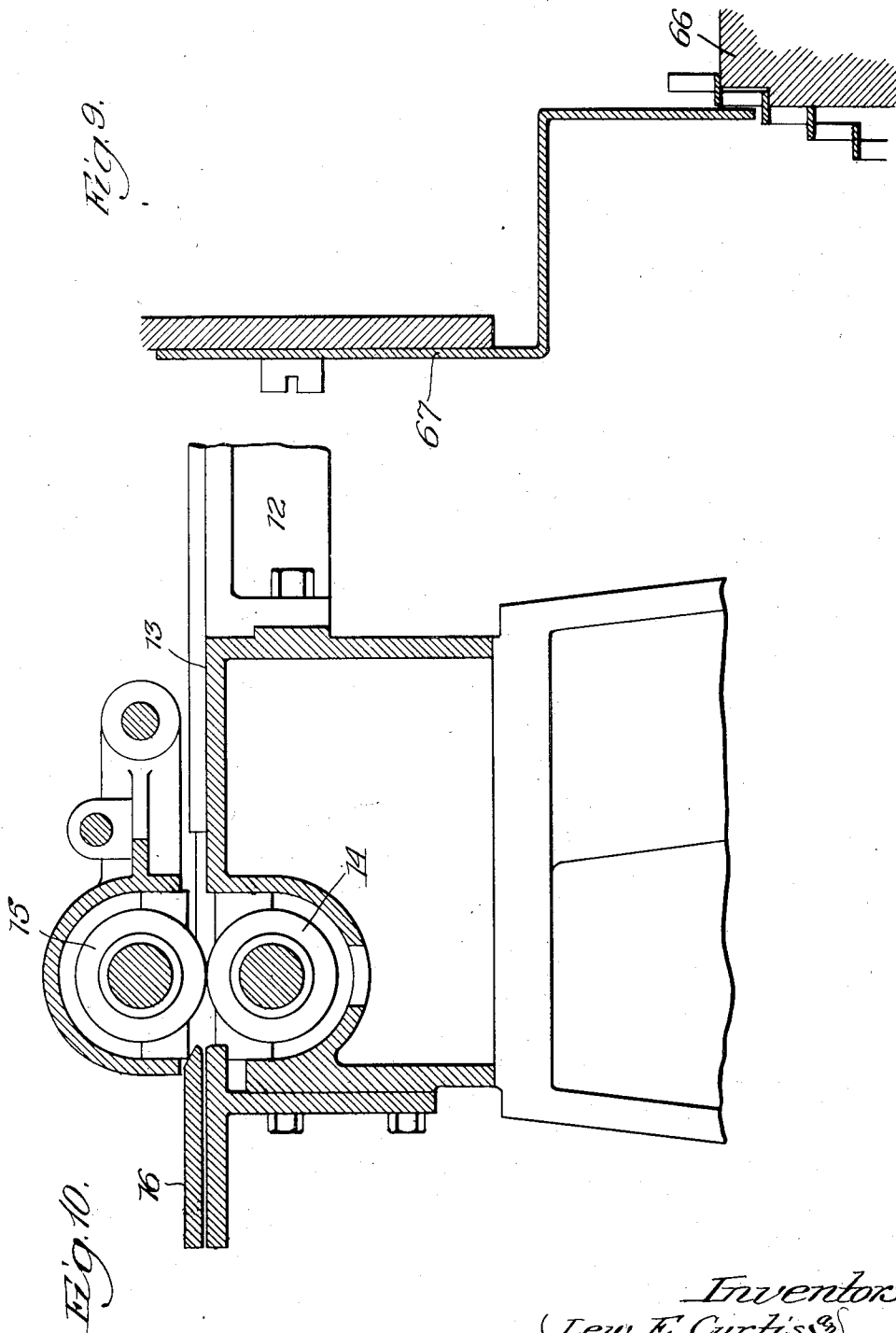
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L. E. CURTIS ET AL

EXPANDED METAL MACHINE

Filed Dec. 8 1922

5 Sheets-Sheet 5



Inventors:
Lew E. Curtis
John Manofsky
By *Byrd, Jenforth, Lee, Christon & Niles*
Attys.

UNITED STATES PATENT OFFICE.

LEWIS E. CURTIS AND JOHN MANOFSKY, OF WARREN, OHIO, ASSIGNORS TO YOUNGSTOWN PRESSED STEEL COMPANY, OF WARREN, OHIO, A CORPORATION OF OHIO.

EXPANDED-METAL MACHINE.

Application filed December 8, 1922. Serial No. 605,734.

To all whom it may concern:

Be it known that we, LEWIS E. CURTIS and JOHN MANOFSKY, citizens of the United States, residing at Warren, in the county of Trumbull and State of Ohio, have invented new and useful Improvements in Expanded-Metal Machines, of which the following is a specification.

The present invention relates to improvements in expanded metal machines and will be fully understood from the following description, illustrated from the accompanying drawing, in which:

Figure 1 is a side elevation of an expanded metal machine embodying the present invention, the figure including a portion of the feeding device.

Fig. 2 is a side elevation of one arm of the expanded metal machine of Fig. 1;

Fig. 3 is a somewhat diagrammatic sectional view showing the adjustment of the individual upper feed rolls of the arm of the expanded metal machine;

Fig. 4 is a transverse sectional view on the line 4—4 of Fig. 2;

Fig. 5 is a transverse sectional view on the line 5—5 of Fig. 2;

Fig. 6 is a transverse sectional view on the line 6—6 of Fig. 2;

Fig. 7 is a plan view of the head of the arm shown in Fig. 2;

Fig. 8 is an enlarged longitudinal section through a part of the arm of Fig. 2;

Fig. 9 is an enlarged detailed section on the line 9 of Fig. 2; and

Fig. 10 is an enlarged longitudinal sectional view through the end feed rolls of the feeding devices shown in Fig. 1.

The expanded metal machine illustrated in the drawings is of the type of the machines shown in prior patents to Lewis E. Curtis, Nos. 796,402 dated August 1, 1905 and 1,207,716, dated December 12, 1916. In this type of machine a previously slitted blank is advanced longitudinally to two expanding arms which diverge vertically and transversely from the line of travel of the sheet, the blank being expanded from its center outwardly by deflection of the strands of the blank and the unexpanded edge portions being held by the divergent expanding arms as they pass therethrough.

In the drawings, the numeral 11 indicates the base or standard upon which the device is supported. The previously slitted blanks

are fed by means of a feeding device 12 of which only the end adjacent to the expanding arms is shown. The previously slitted blank travels along a bed 13 forming part of this feeding device, being gripped near the end of the latter by feed rolls 14 and 15 and is further advanced through the mouth 16 of the feeding device to the guides 16^a which lead the blank into the expanding arms 17 and 18. These arms grip and advance the opposite edges of the blank, the expansion of which is effected by the divergence of the expanding arms. As the blank travels along the expanding arms, it is expanded from the center towards the sides, and the width of the unexpanded edge portions gripped by the expanding arms gradually diminishes. The expanding arms 17 and 18 are similar in construction, but oppositely disposed. In describing the detailed construction of these arms, therefore, similar numerals will be given to similar parts of each of the expanding arms.

The expanding arms 17 and 18 are pivotally mounted at 19 and 20 on suitable brackets 21 mounted on the standard 11. At their opposite ends the arms 17 and 18 are provided with depending slotted projections 22 and 23, through the slots of which pass the bolts 24 which aid in securing the ends of the arms in their proper position with respect to the standard 11. Suitable adjusting bolts 25 also aid in the adjustment and support of the ends of the expanding arms 17 and 18.

The arm 17 is formed of a member 26 of somewhat U-shaped section, in which are journaled the arbors or shafts 27 to which are secured the grooved feed rolls 28. These rolls are preferably formed of laminated construction, being made of circular plates 29 and 30 of alternating larger and smaller diameter. A grooved roll is thereby formed, the grooves of which correspond to the width of depressions on the slitted blank resulting from the slitting operation.

The bed or way of the arms is made up by inserting spacers 31 between the feed rolls 28. The spacers 31 are alternately higher and lower in level at their upper surfaces, the higher ones being indicated by the suffix "a" and the lower by the suffix "b". The position of the higher and lower spacers 31^a and 31^b correspond to the position of the larger and smaller discs making up the

feed roll 28, so that the grooves formed in the bed are continuous with and correspond to the grooves in the feed roll. It will be further noted that the lower spacers 31^b extend into the grooves in the feed rolls 28 (see particularly Fig. 8) and thereby serve also as strippers for the feed rolls.

The spacers 31 are perforated and are mounted upon a bolt 32 which passes through these perforations and through an outer trapezoidal plate 32 and an edge bar 33, the latter being continuous.

After the end feed roll 28, the remainder of the grooved bed is formed by a bar 35, preferably laminated, which is held in position in part by the edge plate 34 and the bolts 32^a. The upper surface of the bar 35 is grooved to correspond with the grooves of the bed and the feed rolls and its width diminishes by steps or shoulders 35^a, the last groove being continued.

The bar 35 at the end of the bed is forced upwardly by coiled springs 36 supported in depressions in the short bar 37 which is mounted on the end of the screws 38. The latter pass through threaded openings in a bar 39 securely fastened to the arm 17.

The spacers 31 between the feed rolls 28 depend downwardly and rest against a bar 40 which is secured to the frame 26 in any suitable manner. Screws 41 are employed to hold the depending ends of the spacers 31 in position.

Above each feed roll 26 is mounted an upper feed roll 42 on a shaft 43 journaled eccentrically in a sleeve 44 which is mounted rotatably in the upper part of the frame work 45 of the arm 17. At the end of the shaft 43 is mounted a gear 46 which meshes with a gear 47 mounted on the shaft 27 for the lower feed roll. The sleeve 44 is provided externally of the framework with a projecting ear 48, into which is hooked the bent end of a bolt 49 which passes through an opening in a lug 50 projecting from the frame work 45. A winged nut 51 is screwed on the bolt 49 and a coiled spring 52 extends from the projection 50 to the winged nut 51. By screwing down or unscrewing the winged nut 50, the position of the sleeve 44 may be adjusted and a desired tension placed thereon.

Between the upper feed rolls 42 are provided the spring pressed plungers 53. These are suspended by the bolts 54 which pass through sleeve 55 mounted in a ledge 56 projecting from the upper frame 55^a. The nuts 57 on the bolts 54 determine the lowermost position of the plungers or feet 53. A coil spring 58 extends from each plunger into an opening in the ledge 56, the tension of the spring being varied at will by means of the screw 59.

At the end of the arm, the unexpanded portion of the blank is held thereupon by

the link belt 60, which is mounted on the drive sprocket 61 and the idler sprockets 62 and 63. Additional idler rolls 64 and 65 hold the chain in its proper position with reference to the end plate 35, these rolls (65) being adjustable in the same manner as the upper feed rolls 42.

At the end of the bar 35 forming a portion of the bed plate of the expanding arm a ledge 66, the upper edge of which is parallel to the median line of travel of the blank, is secured to the expanding arm. This bar is so placed that the upper extreme edge of the completely expanded sheet travels over its upper edge for a short period. A depending plate 67 is secured to the expanding arm above the bar 66, and the lower edge of this plate overlaps the upper edge of the bar 66, being spaced therefrom a distance sufficient to permit the passage of the expanded metal. This plate holds the edge of the expanded metal on the bar 66, and, consequently prevents the meshes at the ends of the expanded metal plate from being drawn inwardly before the metal has properly set in the expanded condition. The action of this plate is more fully described in the copending application of John Manófsky No. 605,612, filed of even date herewith.

Although the present invention has been described in connection with the specific details of an embodiment thereof, it is not intended that these details shall be laid as limitations upon the scope of the invention except in so far as set forth in the accompanying claims.

We claim:

1. In a metal expanding machine, an expander-arm having a grooved bed, feed rolls mounted in the bed, co-operating rollers mounted above said feed rolls and co-operating therewith to effect the movement of a slitted blank therebetween, yieldingly mounted plungers between the upper rolls co-operating with said grooved bed, and means for deflecting the strands of the blank over the edge of the bed.

2. In a metal expanding machine, an expander-arm having a grooved bed, feed rolls co-operating therewith to move a slitted blank along said bed, yieldingly mounted plungers above said bed and co-operating therewith to hold the blank thereagainst, and means for deflecting the strands of the blank over the edge of the bed.

3. In a metal expanding machine, an expander-arm having a groove bed, feeding means for a slitted blank co-operating with the main portion of said bed comprising lower rolls passing through openings provided in the bed and upper rolls co-operating therewith, an end retaining device co-operating with the end portion of said bed, said end retaining device including a flexible

belt co-operating with said grooved bed and moving longitudinally thereof, and means for deflecting the strands of the blank over the edge of the bed.

5 4. In a metal expanding machine, an expander-arm having a grooved bed or way, roller feeding means for a slitted blank co-operating with the main portion of said bed, a flexible belt co-operating with the end
10 portion of the bed for feeding an unexpanded portion of a blank therealong, means for moving said belt longitudinally of the bed, means for holding the edge portion of a blank in expanded position after leaving
15 the end of said bed, and means for deflecting the strands of the blank over the edge of the bed.

5. In a metal expanding machine, an expander-arm having a bed portion and
20 means for retaining a slitted blank during movement along said bed portion including

a flexible metal belt, means for supporting a reach of the belt against the bed portion of the arm, means for moving the belt longitudinally of the bed, and means for deflect- 25
ing the strands of the blank over the edge of the bed.

6. In a metal expanding machine, an expander-arm having a bed portion and means for retaining a slitted blank during move- 30
ment along said bed portion while the blank is being expanded, said means including a flexible metal belt traveling longitudinally of the bed portion and held thereagainst, means for holding the edge portion of a
35 blank in expanded position after leaving the end of the bed portion, and means for deflecting the strands of the blank over the edge of the bed.

LEWIS E. CURTIS.
JOHN MANOFSKY.