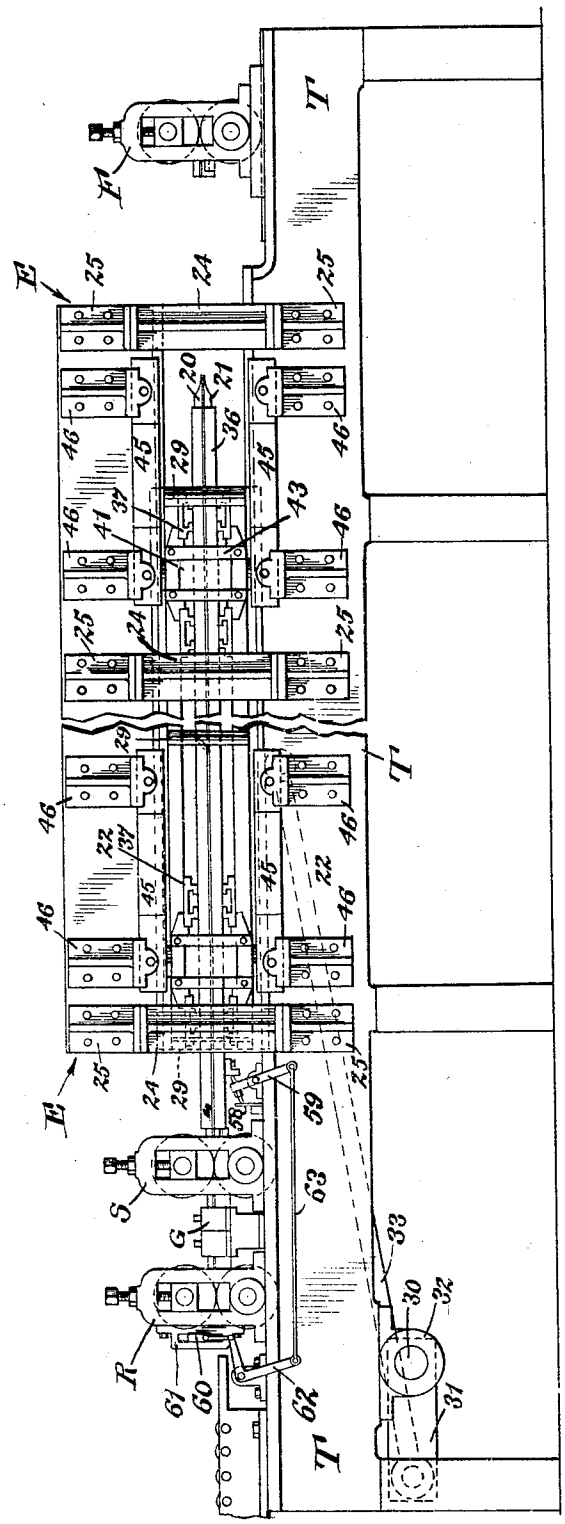
March 24, 1931. H. A. KESSLER 1,797,506

MACHINE FOR THE PRODUCTION OF EXPANDED METAL

Filed July 16, 1928 12 Sheets-Sheet 1

Fig. 1.



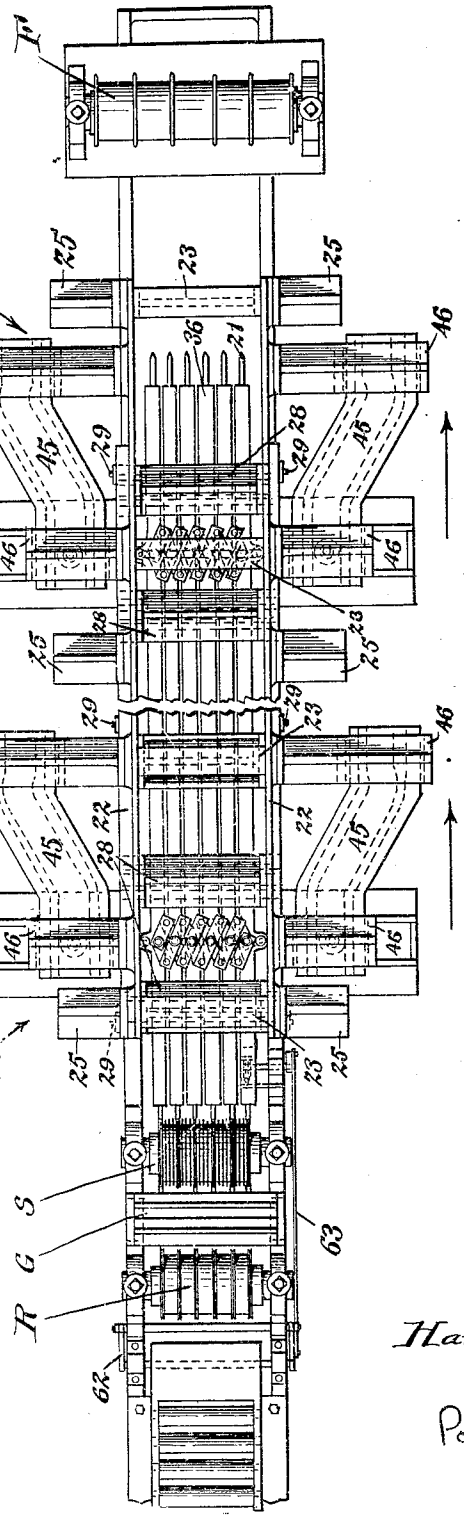
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MACHINE FOR THE PRODUCTION OF EXPANDED METAL

Filed July 16, 1928 12 Sheets-Sheet 2

Fig. 2.



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MACHINE FOR THE PRODUCTION OF EXPANDED METAL

Filed July 16, 1928 12 Sheets-Sheet 3

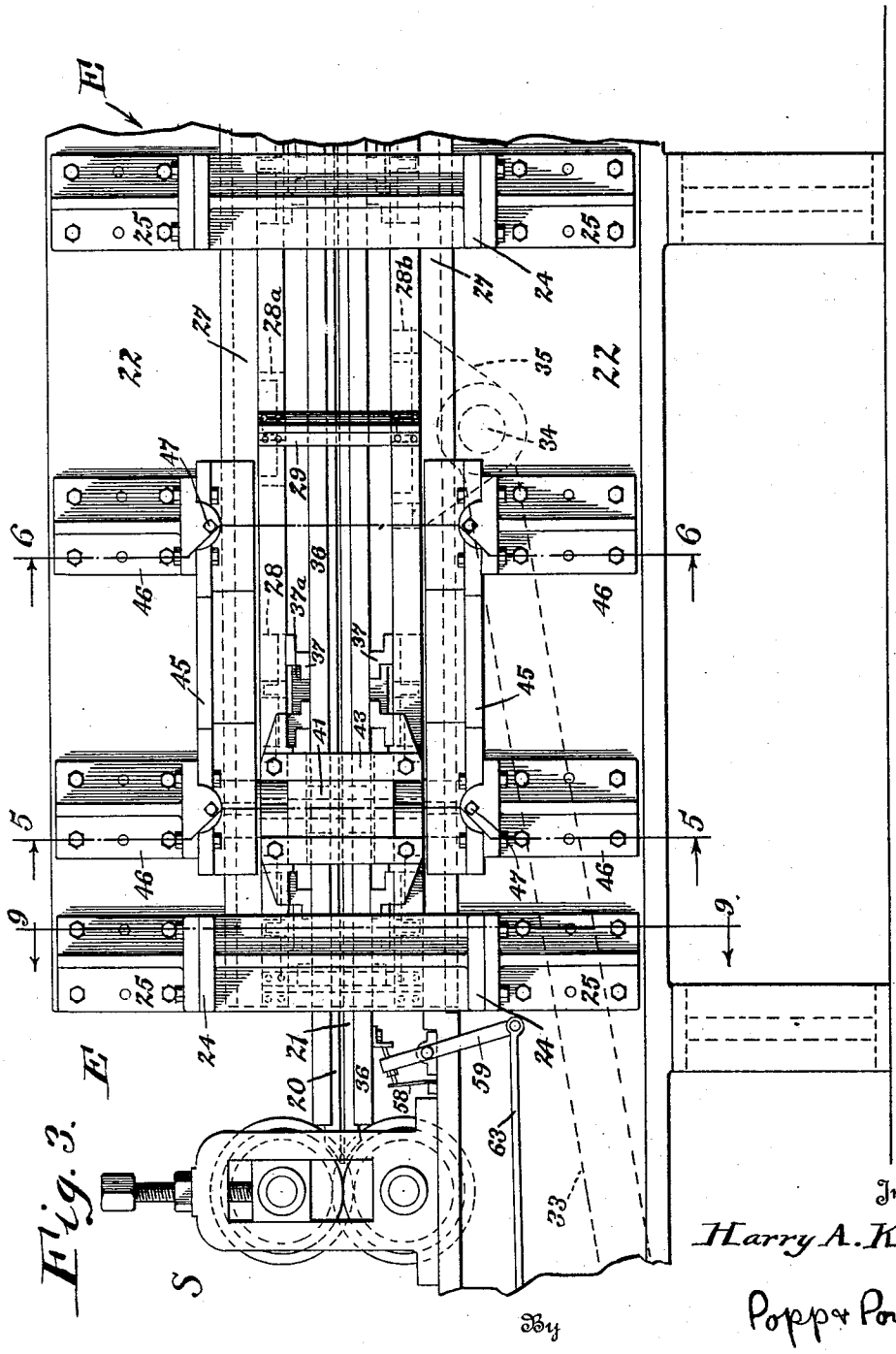


Fig. 3.

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MACHINE FOR THE PRODUCTION OF EXPANDED METAL

Filed July 16, 1928 12 Sheets-Sheet 4

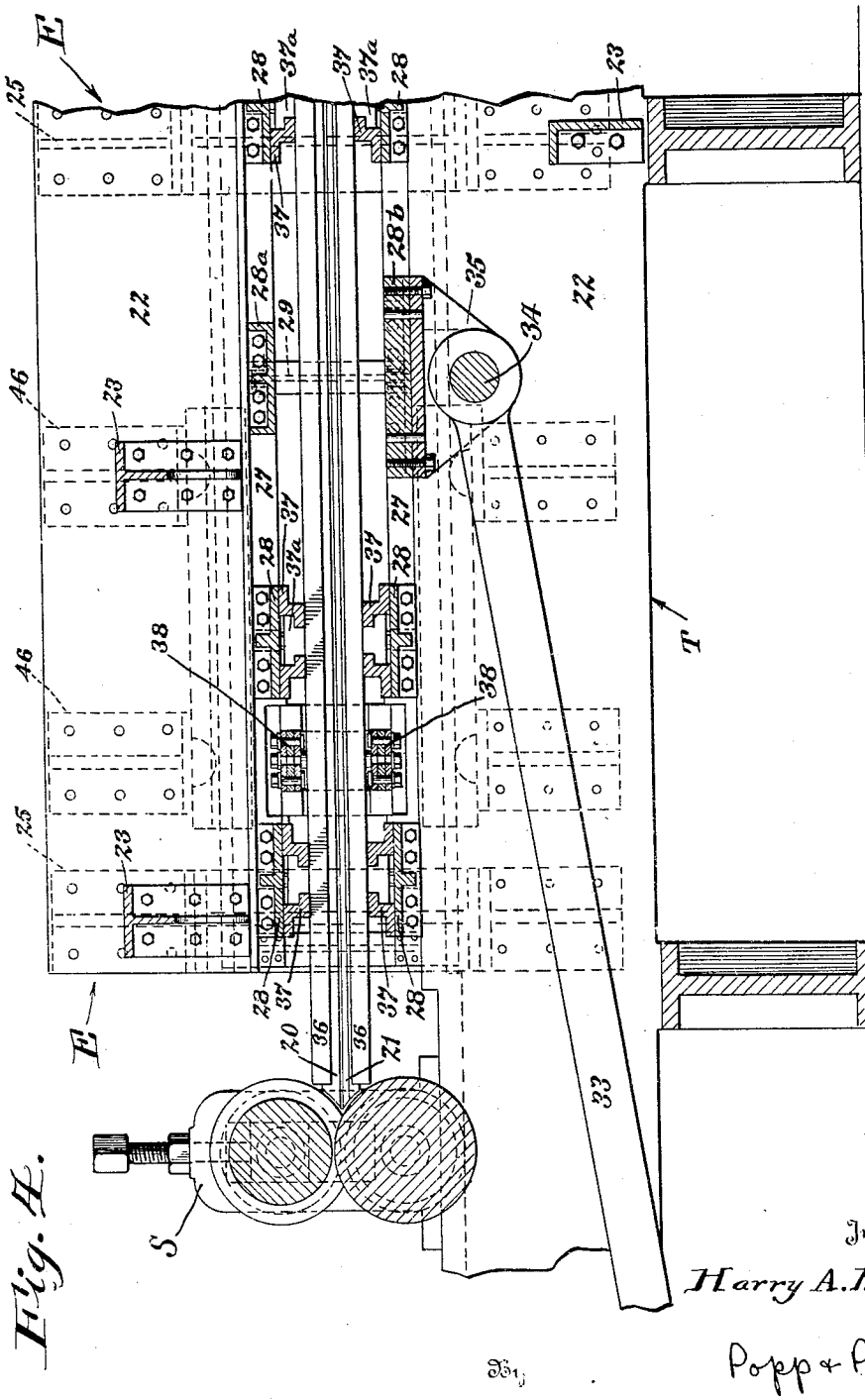


Fig. H.

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MACHINE FOR THE PRODUCTION OF EXPANDED METAL

Filed July 16, 1928 12 Sheets-Sheet 5

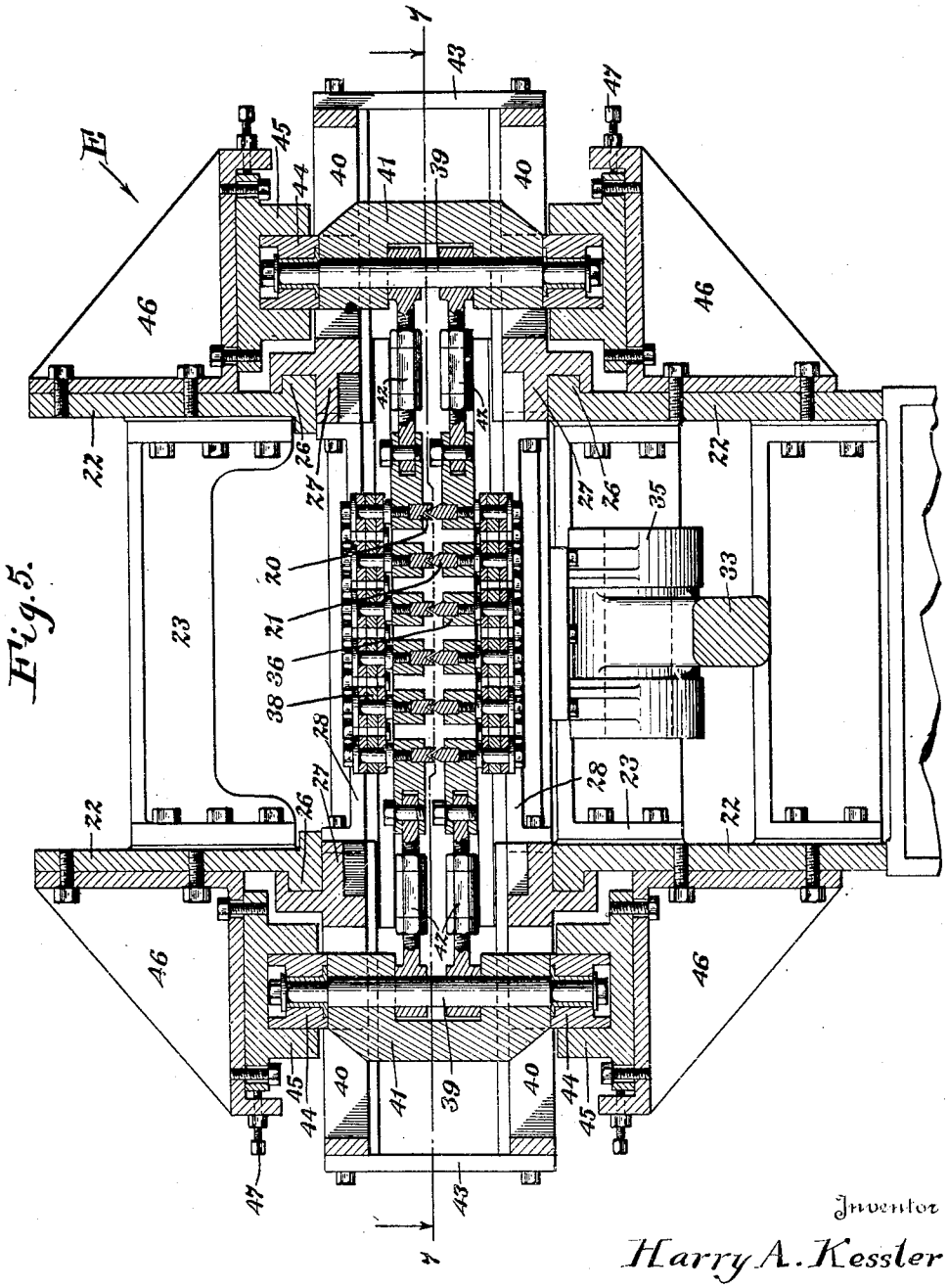


Fig. 5.

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MACHINE FOR THE PRODUCTION OF EXPANDED METAL

Filed July 16, 1928 12 Sheets-Sheet 6

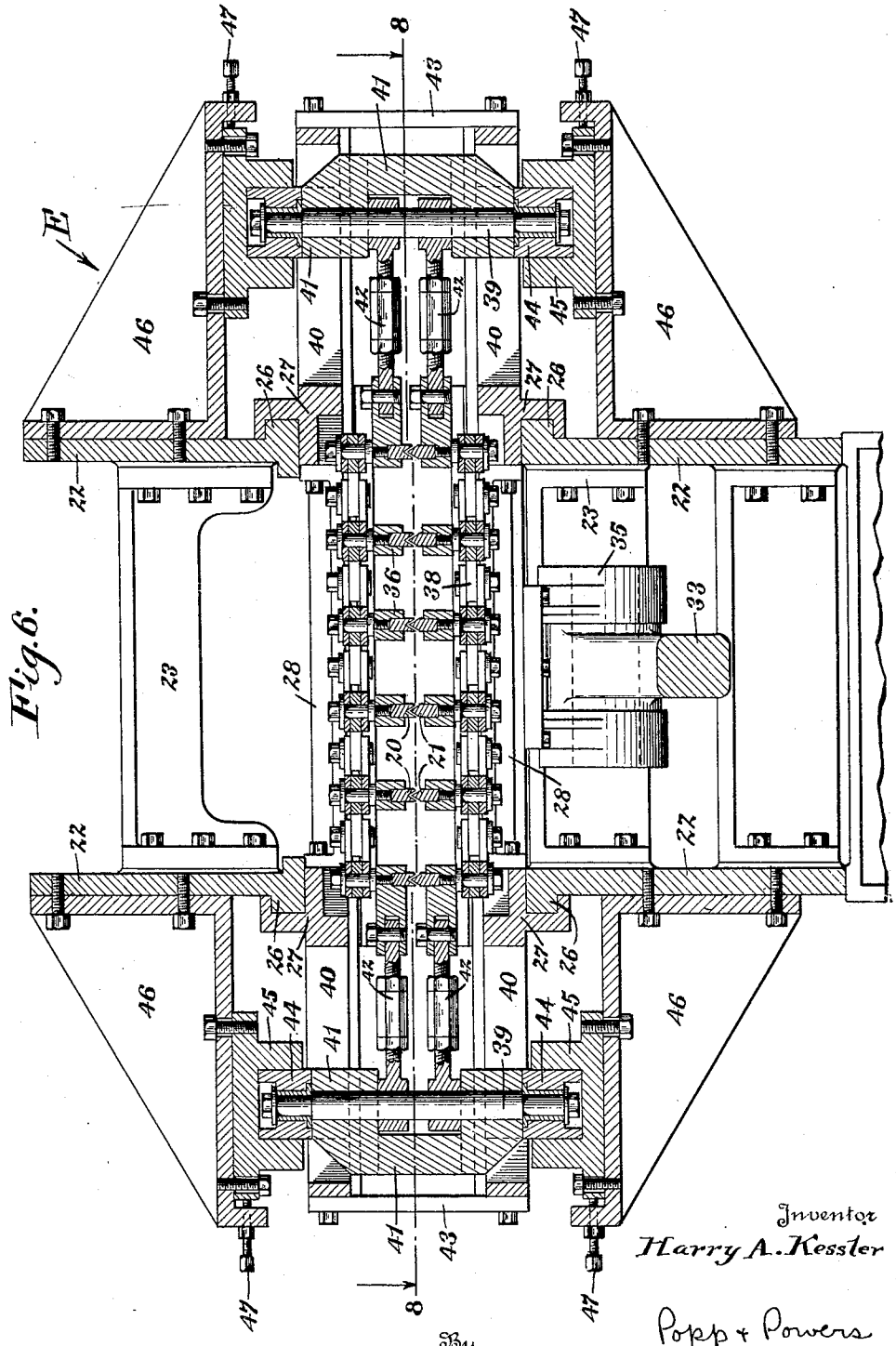


Fig. 6.

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MACHINE FOR THE PRODUCTION OF EXPANDED METAL

Filed July 16, 1928 12 Sheets-Sheet 7

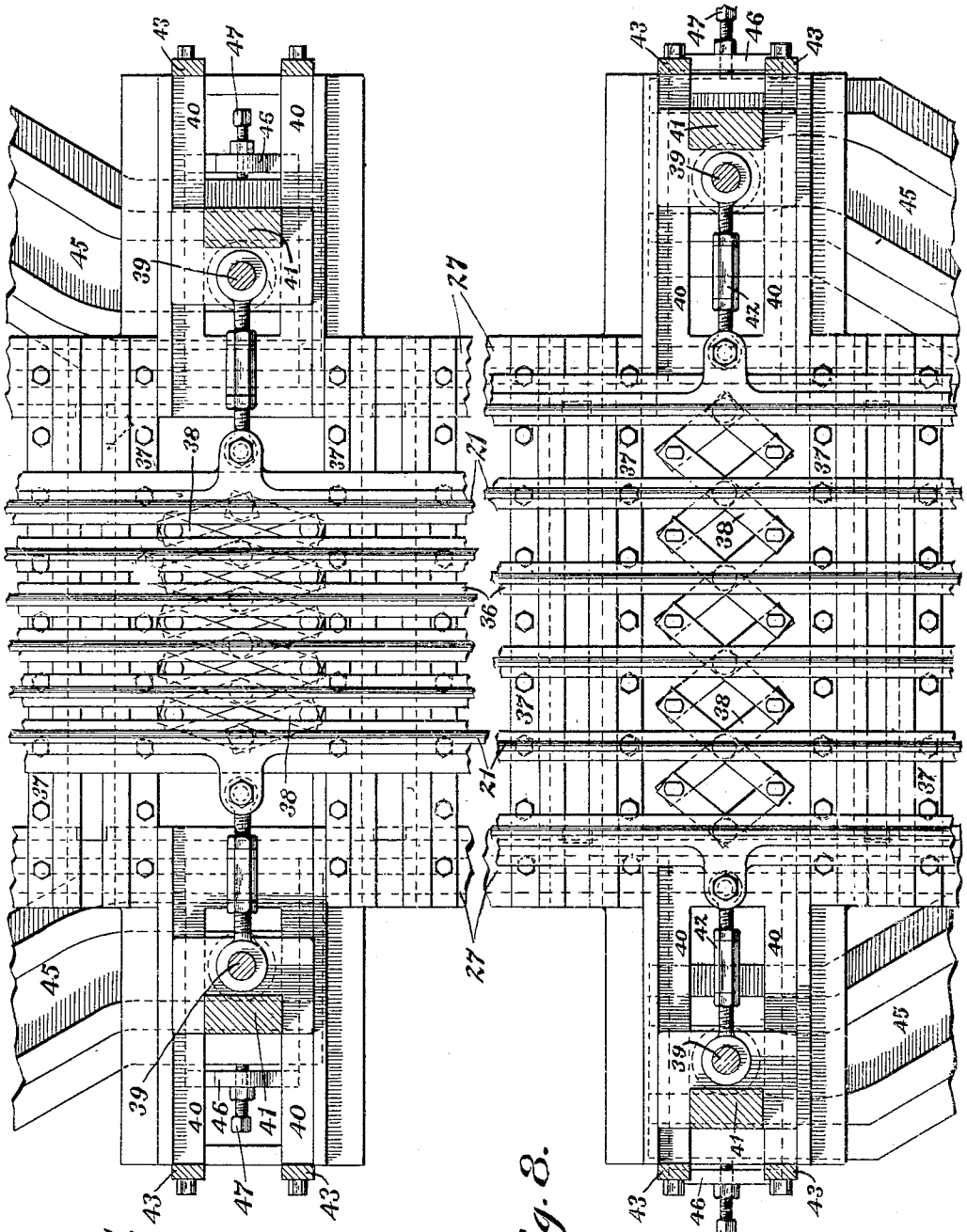


Fig. 7.

Fig. 8.

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March 24, 1931. H. A. KESSLER 1,797,506

MACHINE FOR THE PRODUCTION OF EXPANDED METAL

Filed July 16, 1928 12 Sheets-Sheet 8

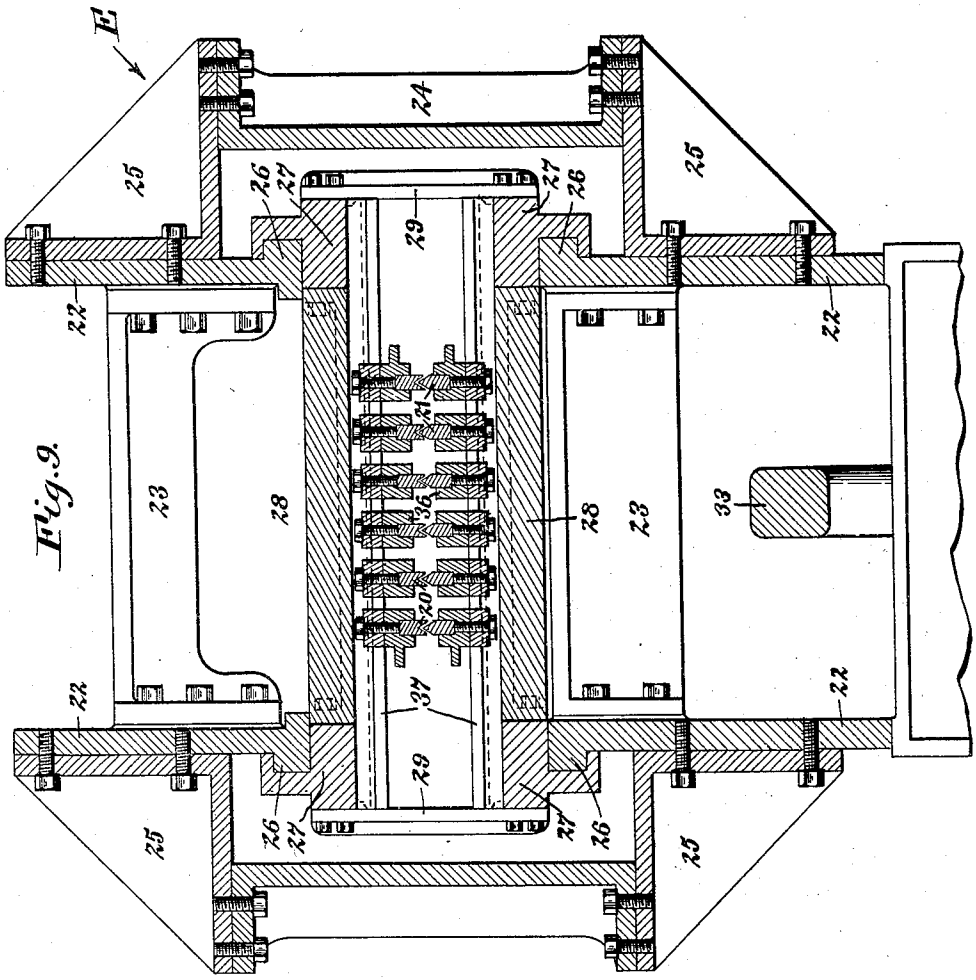


Fig. 9.

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MACHINE FOR THE PRODUCTION OF EXPANDED METAL

Filed July 16, 1928 12 Sheets-Sheet 9

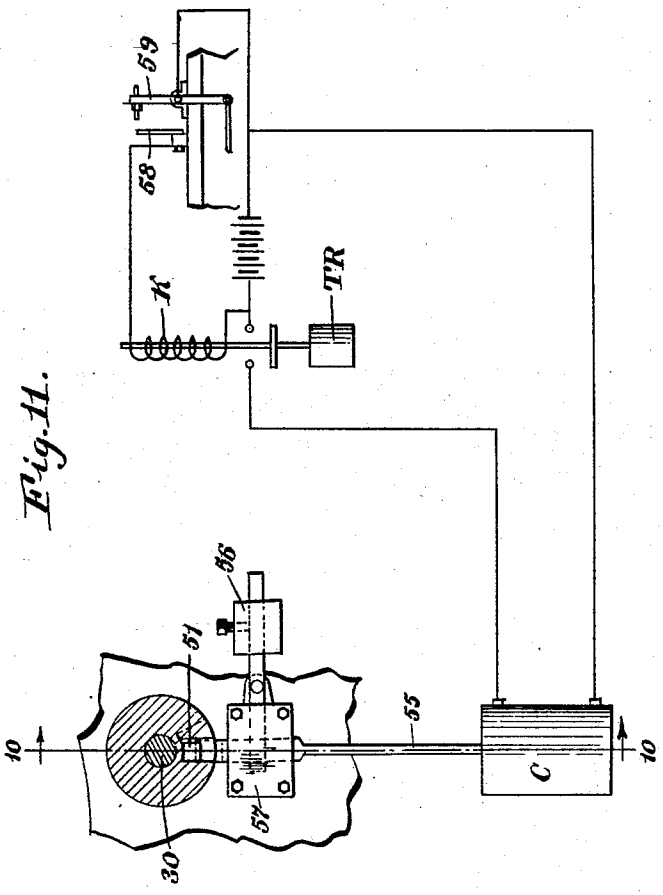


Fig. 11.

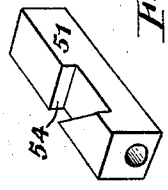


Fig. 12.

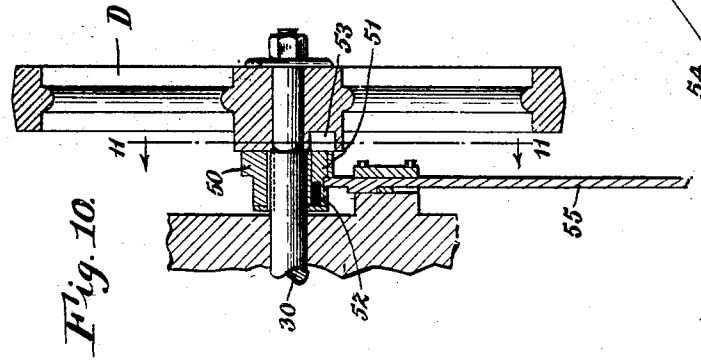


Fig. 10.

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MACHINE FOR THE PRODUCTION OF EXPANDED METAL

Filed July 16, 1928 12 Sheets-Sheet 10

Fig. 13.

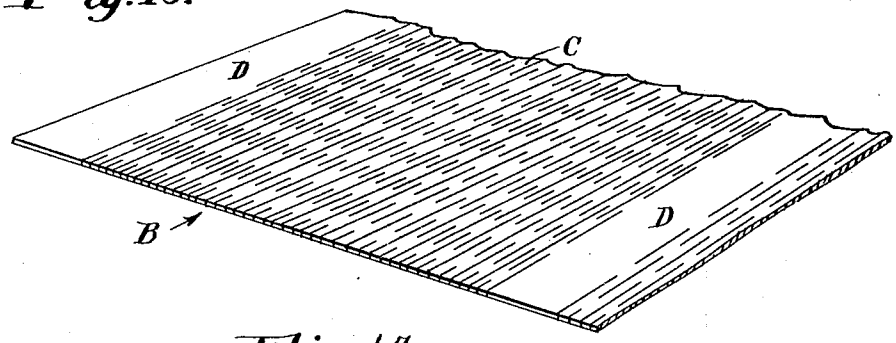


Fig. 14.

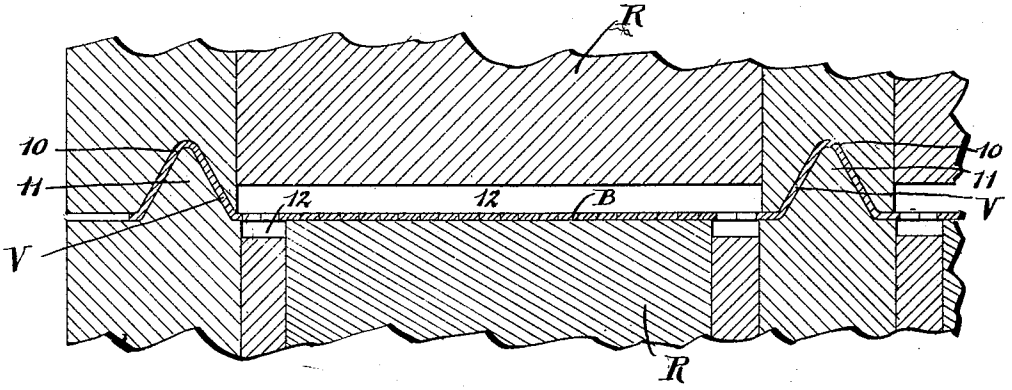


Fig. 15.

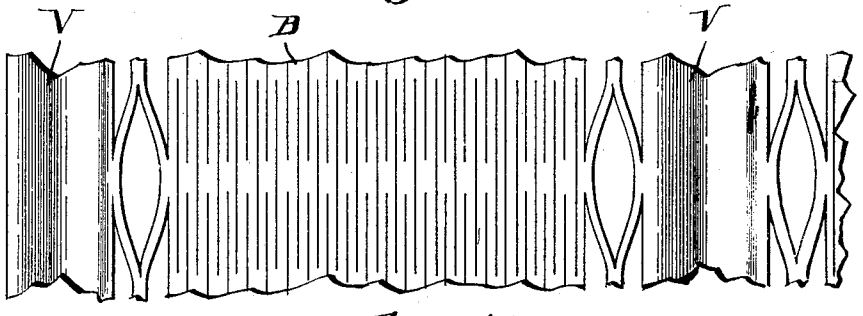
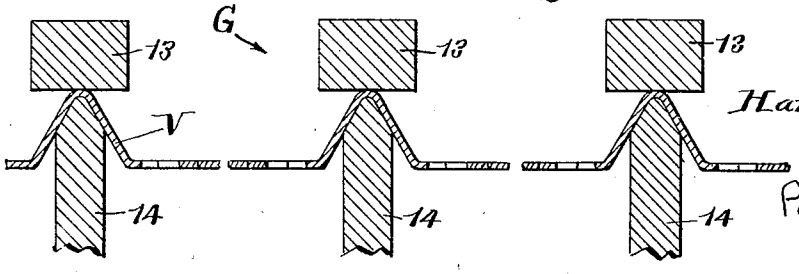


Fig. 16.



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MACHINE FOR THE PRODUCTION OF EXPANDED METAL

Filed July 16, 1928 12 Sheets-Sheet 11

Fig. 17.

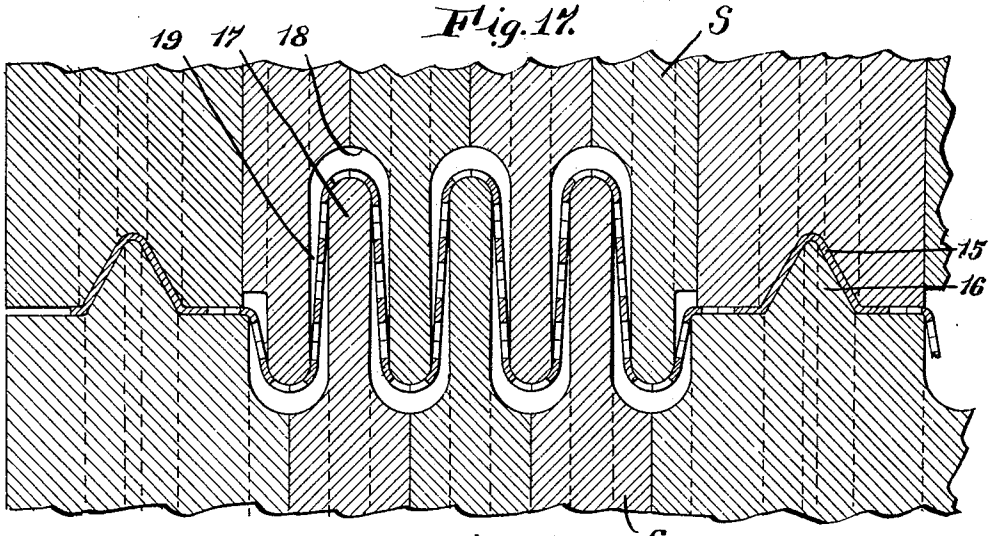


Fig. 18.

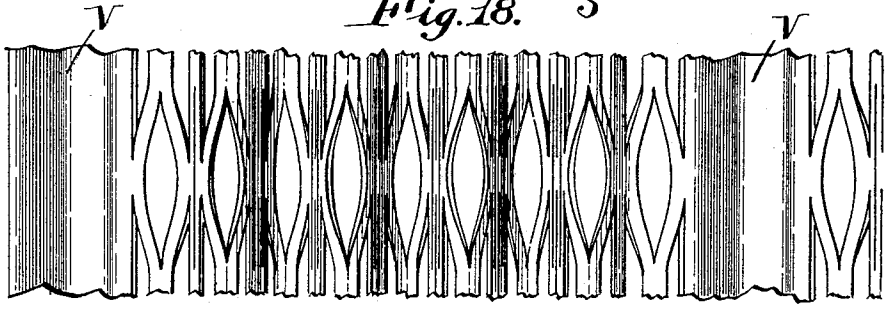
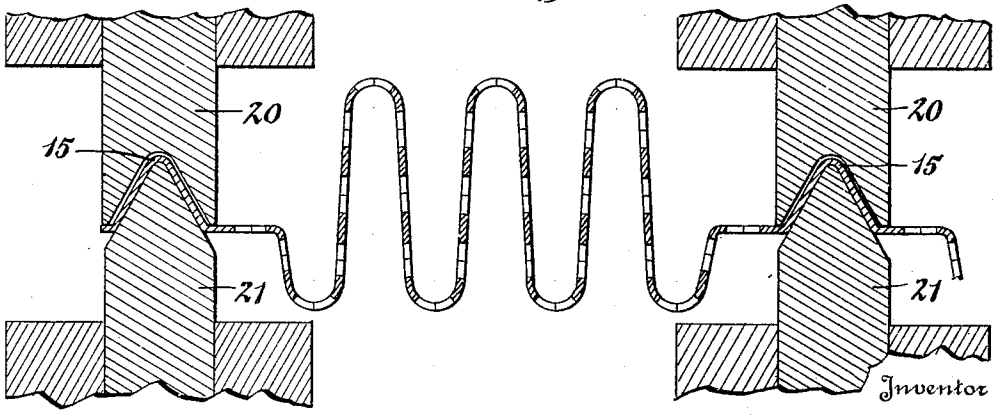


Fig. 19.



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MACHINE FOR THE PRODUCTION OF EXPANDED METAL

Filed July 16, 1928 12 Sheets-Sheet 12

Fig. 20.

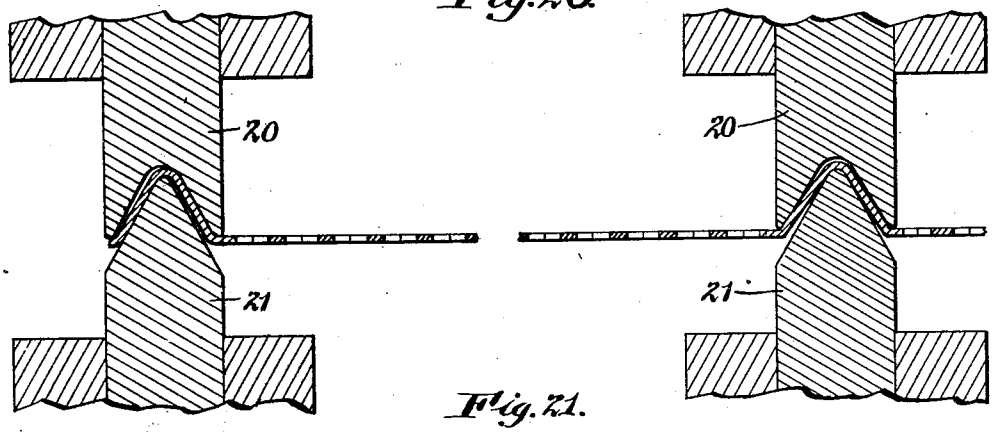


Fig. 21.

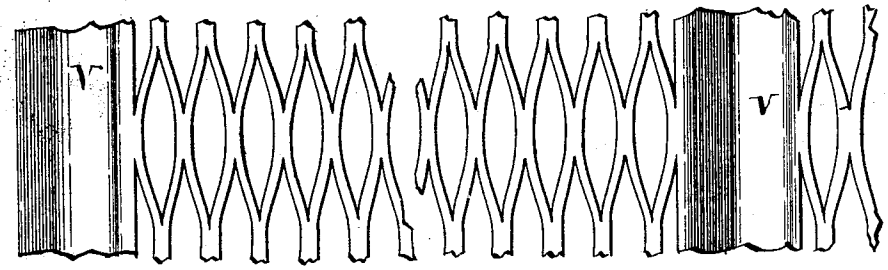
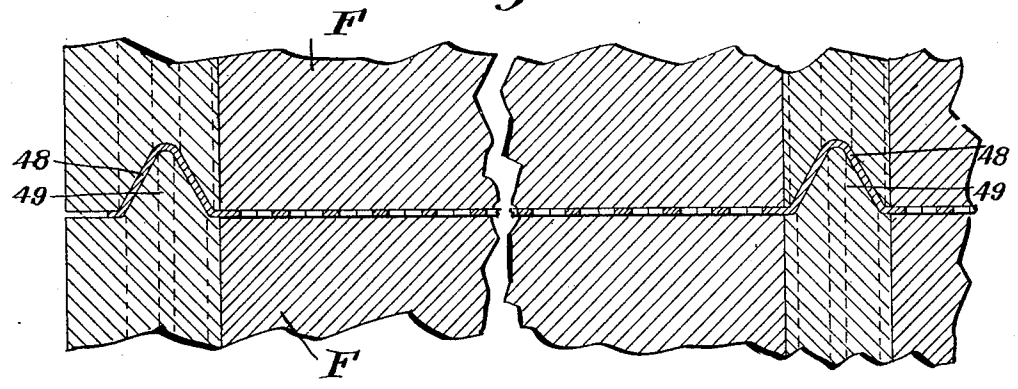


Fig. 22.



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1,797,506

UNITED STATES PATENT OFFICE

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MACHINE FOR THE PRODUCTION OF EXPANDED METAL

Application filed July 16, 1928. Serial No. 293,233.

This invention relates to machines for the production of expanded metal lath and more particularly to a machine which operates upon blanks of determined length.

The principal object of the invention is to provide a machine by which expanded metal lath may be quickly and economically produced.

A further object is to provide a machine applicable to the production of lath having elongated strands and which operates in such manner that lath of superior quality is produced, the strands being uniform and free from tears or cracks.

A further object is to provide a machine applicable to the production of ribbed lath and which operates with a minimum degree of frictional resistance to the blank.

An embodiment of the invention is illustrated in the accompanying drawings, wherein:

Figure 1 is a side elevation of the complete machine.

Figure 2 is a top plan view of the same.

Figure 3 is a fragmentary side elevation showing the stretching rolls and a portion of the blank straightening means.

Figure 4 is a vertical section along the longitudinal center line of Figure 3.

Figure 5 is a section along line 5—5 of Figure 3, showing the blank straightening means prior to operation.

Figure 6 is a section along a line corresponding to line 6—6 of Figure 3, showing the blank straightening means at the completion of its straightening operation.

Figure 7 is a fragmentary section along line 7—7 of Figure 5.

Figure 8 is a fragmentary section along line 8—8 of Figure 6.

Figure 9 is a section along line 9—9 of Figure 3.

Figure 10 is a vertical section through the longitudinal center of the drive shaft clutch.

Figure 11 is a schematic view of the control and clutch operating circuit together with a section of the clutch along line 11—11, of Figure 10.

Figure 12 is a perspective of clutch connection pin.

Figure 13 is a perspective of a fragment of the slitted blank.

Figure 14 is a section through the ribbing rolls during the rib forming operation.

Figure 15 is a bottom plan view of a fragment of the blank as it appears on emergence from the rib forming rolls.

Figure 16 is a section through the guides between the ribbing and stretching rolls.

Figure 17 is a section through the stretching rolls during the stretching operation.

Figure 18 is a bottom plan view of a fragment of the blank as it appears on emergence from the stretching rolls.

Figure 19 is a section through the blank straightening means prior to its straightening operation and showing more particularly the cross section of the blank at such time.

Figure 20 is a section through the blank straightening operation and showing more particularly the blank as widened and cross sectionally straightened.

Figure 21 is a bottom plan view of a fragment of the blank as it appears on emergence from the blank straightening means.

Figure 22 is a section through the finishing rolls during the finishing operation.

In the manufacture of lath by this machine, a hot or cold blank B may be utilized, a hot blank being preferred. The manufactured lath is preferably ribbed and preferably of diamond mesh type and to this end the blank utilized is characterized by parallel longitudinal slitted and unslitted zones C and D respectively in which each slitted zone C extends between adjacent unslitted zones D and comprises several longitudinal rows of slits wherein the slits of one row are in staggered or break-joint relation to the slits of adjacent rows in the same zone. The blank B may be slitted by any suitable mechanism (not shown) and having been brought to the desired temperature is ready to be processed by the machine.

As preferred and herein shown the machine consists generally of the following instrumentalities which operate on a slitted blank in the order enumerated, namely, ribbing rolls R, expanding rolls S, widening and flattening means E and finishing rolls F, all

of which are preferably supported on a common base or table T.

For the ribbing operation cooperating rolls R are employed. The upper roll is formed with (see Fig. 14) peripheral channels 10 and the lower roll with cooperating peripheral ribs 11 which operate in the chanels 10 and shape the flat non-slitted zones D of the blank into reenforcing ribs V of suitable cross section such as the inverted V cross section shown. The ribbing rolls are formed to provide upper and lower clearances 12 as described in my companion application filed August 18, 1927 and serially numbered 213,799, and for the purpose therein set forth.

From the ribbing rolls R, the ribbed blank passes through an intermediate guide G to the expanding rolls S. The guide G preferably employs a series of parallel elements, each composed of (see Fig. 16) an upper bar 13 which overlies a rib V and a lower bar 14 arranged below and conforming to the under side of the rib, these elements functioning to insure the exact registry of the blank with the stretching rolls S.

The expanding rolls S include guiding elements which engage the ribs V of the blank to guide it through the rolls, each guiding element comprising (See Fig. 17) a peripheral channel 15 on the upper roll and a cooperating peripheral rib 16 on the lower roll. These rolls preferably operate to stretch the strands and the complete stretching of the strands of all the slitted zones is preferably simultaneously accomplished in a manner such that each slitted zone C is bent into a series of parallel longitudinal convolutions, that is to say, so bent as to have a tortuous or sinuous cross section. For this purpose each of the rolls S is formed with a series of peripheral ribs 17 and peripheral channels 18, the ribs of one roll extending into the channels of the other roll and the faces of the channels being spaced from the cooperating ribs whereby clearances 19 are provided in which the stretching takes place. Obviously the number of ribs and channels utilized may be varied as desired within limits of practicability.

On emergence from the expanding rolls S, the blank is ready to be deployed, that is to say, returned to a flat cross section and thereby widened to the extent determined by the elongation of the strands. This is accomplished by the means E which preferably operates with little or no further stretching of the strands.

The widening and cross sectional straightening of the blank is accomplished generally by engaging the ribs V substantially throughout their extent and increasing their mutual separation while at the same time moving the blank forward toward the finishing rolls F and in a manner such that the cross section straightening of the blank is completed when it reaches the finishing rolls F. For the purpose of engaging the ribs of the blank, straightening means E includes a series of parallel rib-engaging elements, each of which is composed of (see Figures 19 and 20) an upper bar 20 shaped to fit over and substantially conform to the upper face of the ribs V of the blank, and a lower bar 21 similarly shaped with respect to the under face of the ribs.

The blank passes from the expanding rolls S directly into the blank straightening means E, the guiding elements 15 and 16 of the rolls S serving to guide the ribs V into the space between the rib-engaging bars 20 and 21. To facilitate the entry of the ribs into such space the ends of the bars 20 and 21 are tapered (see Fig. 4) so as to conform to the outline of the stretching rolls S thereby enabling the ends of the bars to be placed immediately adjacent the corresponding guiding element of the rolls S. When the blank has completely emerged from the rolls S and has come to rest between the rib engaging bars 20 and 21, the mechanism is operated to move the bars forward as a unit, the bars carrying the blank with them and in their forward movement being also uniformly moved laterally or relatively laterally away from one another. As the bars are thus laterally separated, the cross sectional convolutions of the blank are gradually reduced whereby at the end of the lateral separation, the reduction is complete and the expanded parts of the blank are thus returned to a substantially flat cross section while at the same time they are widened out to the extent permitted. This point is reached at or near the end of the forward movement of the bars 20 and 21. When the end of the forward movement is reached, the forward end of the blank which projects slightly beyond the corresponding end of the bars, is engaged by the high speed finishing rolls which jerk the blank from its position between the bars and perform the usual finishing operation. The bars are now returned to their initial positions and are thus conditioned to receive the next blank.

The blank straightening means E, as a whole, comprises a stationary supporting housing, a carriage frame which is supported by, and adapted for longitudinal reciprocatory movement on, the stationary housing and means including the rib engaging elements, for engaging and supporting the blank upon the carriage, said means being adapted to cooperate with parts attached to the stationary housing, in a manner such as to effect the lateral separation of the rib engaging elements, and consequently the widening of the blank during the forward movement of the carriage, and to effect the lateral approach of the bars during the return or rearward movement of the carriage.

The stationary supporting housing includes, in a general way, an upper and a lower

pair of longitudinal beams 22 symmetrically arranged and set on edge, it being noted that the lower beams comprise a part of the supporting base or table T. The members of each pair of beams 22 are spaced from each other by intermediate tie-members 23 which preferably are placed at equal distances along the length of the beams (four upper members 23 being illustrated in Fig. 2). The upper and lower pairs of beams are vertically spaced from each other by brackets 24 which are placed along the outer sides of the beams and extend vertically between upper and lower housing brackets 25 (three brackets 24 being shown on each side of the machine). The inner longitudinal margins of the beams 22 are formed with outwardly extending guide flanges 26 on which the carriage frame slides.

The carriage frame includes in a general way, longitudinal carriage members 27 which correspond in number and arrangement to the beams 22, each member 27 extending along the inner horizontal or marginal face of its corresponding beam and being formed to extend around and fit over the beam guide flanges 26.

The carriage members 27 of each upper and lower pair are spaced by intermediate tie members 28 which preferably are placed in pairs adjacent opposite ends of the members 27, the tie members of each pair being somewhat spaced. The vertical spacing of the carriage members 27 is maintained by the vertical brackets 29 which are secured directly to the members 27 at intervals throughout their length (three brackets 29 being shown on each side of the machine). The upper pair of members 27 also carry a centrally located transverse bracket 28*a* while the lower pair carry a similarly arranged bracket 28*b*.

As stated previously, the carriage frame is adapted for longitudinal reciprocatory motion and to this end a drive shaft 30 having a crank arm 31 is utilized, the shaft being journaled in bearings 32 secured to the under face of the base or table T. The shaft is operatively connected to the carriage frame by a connecting rod 33, one end of which is journaled on the crank pin. The other end of the connecting rod 33 is journaled on a pin 34 which is carried by a bracket 35, secured to the under face of the carriage bracket 28*b*. Thus as the crank pin moves through one complete rotation, the connecting rod 33 effects a complete longitudinal reciprocation of the carriage frame, producing an operation and a normalizing of the means E. The shaft 30 may be driven by any suitable means (not shown).

The rib engaging bars 20 and 21 extend longitudinally of the machine and are horizontally arranged within the carriage frame in a manner such that when in the initial or "retracted" position their rear ends extend to a point immediately adjacent the stretching rolls S and when in the "extended" position their forward ends extend to a point immediately adjacent the finishing rolls F. The bars 20 and 21 are preferably fitted in and secured to substantially coextensive holders 36 but if desired the holders may be made as an integral part of the bars.

The spacing between the bars 20 and 21 is preferably made just sufficient to provide for the ready insertion of the blank. The bars are supported in this relation by upper and lower transverse guides 37, a pair of guides being utilized adjacent the ends of each series of bars 20 and 21. The guides 37 are preferably made in two pieces having a form such that when they are bolted to the intermediate tie members 28, they cooperate to outline a T-slot. The holders 36 each carry cooperating T-shaped members 37*a* which are slidably fitted in the corresponding T-slot, the members being shaped to prevent turning within the slot. These guides 37 also function to maintain the relative longitudinal positions of the bars, that is to say, they prevent the bars from moving longitudinally with respect to each other and to the carriage frame whereby their movement as a unit is insured.

The lateral separation of the bars is preferably accomplished in a manner such that the spacing between the bars is uniformly increased. This condition is insured by the use of lazy tongs 38 which are positioned transversely across, and adjacent to, the opposite ends of each series of bars 20 and 21, preferably between the corresponding pair of transverse guides 37, the adjacent center points of the lazy tongs being bolted or otherwise secured to the adjacent holders 36.

The extension and retraction of the upper and lower set of bars 20 and 21, must of course, be accomplished as a unit, that is to say, they must make every relative movement simultaneously. The means utilized to insure this result includes the upright pins 39 which are vertically placed on opposite sides, and at each end of, the machine, each pin preferably being aligned with the center points of the adjacent lazy tongs 38.

The pins 39 are supported on carriage guide arms 40 by a sleeve member 41, the guide arms 40 preferably being formed integrally with the carriage members 27 and in pairs which extend outwardly from the members 27, the arms of each pair lying on either side of the pins 39. Each sleeve member 41 which carries a pin 39 is slidably supported between and upon cooperating upper and lower pairs of guide arms 40, and is slidable laterally on the arms 40 a distance corresponding to the lateral movement of the adjacent rib engaging element. The pins 39 are connected to the adjacent rib engag-

ing element by adjustable intermediate links 42. The outer ends of the upper and lower arms 40 are preferably braced by tie members 43.

The upper and lower ends of each upright pin 39 are provided with rollers 44 which operate in the ways or channels of guides 45. These guides are somewhat of ogee form, having forward and rearward end portions which extend in substantially longitudinal parallel relation with each other and with the machine, and symmetrically arranged forwardly diverging intermediate portions. The guides 45 are supported on brackets 46 secured to the longitudinal stationary housing beams 22 and their positions may be adjusted by screws 47.

The blank passes from the expanding rolls S directly into the straightening means E and is there supported by the rib engaging bars 20 and 21. The carriage frame is now moved forward as a whole, during which movement the engagement of the forwardly moving upright pins 39 with the guides 45 (through rollers 44) causes the relative outward movement of the forwardly moving rib engaging bars.

It is noted that the pins 39 are guided and supported in their outward movement by the outwardly extending forwardly moving guide arms 40 (through sleeve member 41). It is also noted that the alignment or relative longitudinal position of the rib engaging bars during this combined movement is maintained by the cooperation of the forwardly moving transverse guides 37 and that the uniform increase in spacing between these bars is assured by the lazy tong connections. At the end of the forward movement and after the blank has been completely widened and straightened the upright pins 39 are moved inward by a slight inward offsetting of the guides 45 to cause a corresponding movement of the rib engaging bars in order to relieve the cross sectional tension of the blank and thereby facilitate its removal by the finishing rolls F. At the end of the forward movement the forward end of the blank is engaged by the finishing rolls F which preferably operated at a high speed and jerk the blank from the straightening means before it can be retracted by the backward movement of such means. The upper roll of the finishing rolls F is formed with peripheral channels 48 and the lower roll with peripheral ribs 49 which operate in the channels 48, the ribs and channels engaging the ribs V to guide the blank through the rolls. These rolls operate merely to complete the flattening of the blank, to set the strands, and give the manufactured product a desired finish.

The blank straightening means E, upon each return to initial position must remain in such position, i. e., normalized, for a period of time sufficient to permit the blank to emerge fully from the rolls S and come to rest between the bars 20 and 21. This delayed action may be controlled by the operator but it is preferably controlled automatically by means which permits the drive shaft 30 to make one complete revolution corresponding to the extension and retraction of the means E and then disconnects the shaft 30 from the driving means for the necessary period of time.

The means for controlling the delayed action of the blank straightening means is illustrated in Figures 10, 11 and 12 wherein the driving means is indicated by the wheel D. Such means include an annular clutch member 50 which is keyed to the drive shaft 30 of the machine, and is formed with a passage in which a clutch pin 51 is fitted. The pin 51 is normally urged outward by a spring 52 into engagement with the hub of the wheel D or into the aperture 53 formed in the hub in which case it connects the wheel D with the drive shaft 30, it being understood, of course, that the wheel D is loosely journaled on the shaft 30. The clutch pin 51 is formed with a groove 54 one side of which is inclined with respect to the other side, to provide a cam face. This groove coincides with an aperture in the peripheral surface of the annular member 50. The purpose of this aperture is to permit the insertion of an upright bar 55 into the groove 54 of the pin 51, the bar engaging the cam face of the groove to retract the pin against the action of the spring 52. The bar 55 is normally urged upward into contact with the peripheral surface of the annular member 50 or into the groove 54 of the pin by a weight 56. The lower end of the bar 55 extends into a solenoid coil C which when energized pulls the bar downward against the action of the weight 56 and out of engagement with the pin 51 and member 50, the travel of the bar being centered by a guide 57. The energization of the solenoid coil C is controlled by the coil K of the time relay TR. The energization of the time relay TR is, in turn, controlled by stationary contact 58 and the movable contact 59. The contacts 58 and 59 are mounted on the table T (see Figs. 1 and 2) and arranged to be forced into contact with each other by the rib engaging elements of the carriage frame when the latter returns to the initial or unexpanded position.

In the operation of the arrangement above described the driving wheel D normally rotates loosely upon the drive shaft 30 and it may be assumed that the carriage frame has just returned to its initial position and completed the circuit of the time relay TR. After the lapse of a period of time sufficient to permit a blank to pass through the ribbing rolls R and expanding rolls S and come to rest in the straightening means E, the time

relay TR completes the circuit of the solenoid coil C whereupon this coil retracts the bar 55 from its engagement with the clutch pin 51. The spring 52 now forces the pin 51 outward into engagement with the hub of the rotating wheel D until the aperture 53 formed in the hub, coincides with the pin whereupon the spring forces the pin into said aperture. This effects a driving connection between the wheel D and the drive shaft 30 with resultant operation of the means E. As soon as the carriage frame starts the forward movement the connection between contacts 58 and 59 on the table T is broken, thereby deenergizing the coil K of the time relay TR which, in turn, causes the solenoid coil C to be deenergized. The bar 55 is, therefore, released by the solenoid and moves upward against the periphery of the annular member 50 under the action of the weight 56, it being noted that the annular member 50 has not yet made a complete revolution and the bar 55 cannot, therefore, engage the pin 51. In the meantime, the means E effects the widening and cross sectional straightening of the blank and upon the completion of one revolution of the drive shaft 30 the carriage frame is returned to its initial position. At the same time, however, the annular clutch member 50 also completes one revolution and thereby reaches the point at which the bar 55 projects into the annular member 50 to engage and retract the clutch pin 51, thus disconnecting the shaft 30 from the driving wheel D. Furthermore the return of the carriage frame to its initial position again closes the circuit of the coil K which, after the lapse of the time interval for which the time relay TR is set, energizes the solenoid coil C to retract the bar 55 and permit the pin 51 to connect the driving wheel to the drive shaft, thus repeating the cycle.

From the foregoing it will be readily appreciated that a blank must not be fed into the ribbing rolls before the widening means E is conditioned to receive it. To insure this result, a latching bar 60 is placed transversely before the ribbing rolls R. The bar 60 is slidably secured in a frame 61 in which it is movable into or out of the path of the blank as it approaches the rolls R. This bar is connected through bell crank 62 and link 63 to the lower end of the movable contact arm 59. Thus when the carriage frame actuates the contact arm 59 to close the circuit of the time relay coil K, it also moves the latching bar 60 out of the path of the blank. The blank can, therefore, enter the ribbing rolls R and continue through the expanding rolls S coming to rest between the bars 20 and 21 of the means E, the time relay TR being set for the period of time required for such movement of the blank. When the carriage frame moves forward, the weight of the latching bar 60 will force the contact arm 59 back to the circuit breaking position and incidentally returns itself to the latching position.

Having fully described my invention, I claim:

1. In a machine for producing expanded metal lath the combination with expanding means which operates on a blank of determined length and in its operation produces a cross section having displaced components; means for widening and cross sectionally straightening such blank consisting of elements to engage the same, mechanism for reciprocating said elements longitudinally and mechanism for increasing the relative spacing of the elements during their longitudinal movement in one direction; and means engaging the blank at the completion of the widening and cross section straightening operation for withdrawing it longitudinally from and out of engagement with said elements.

2. In a machine for producing expanded metal lath the combination with expanding means operative on a ribbed blank of determined length to expand the same in zones between the ribs and which produces in each zone a cross section having displaced components; means for widening and cross sectionally straightening such blank consisting of elements to engage the ribs, mechanism for reciprocating said elements longitudinally and mechanism for increasing the relative spacing of the elements during their longitudinal movement in one direction; and means engaging the blank at the completion of the widening and cross section straightening operation for withdrawing it longitudinally from and out of engagement with said elements.

3. In a machine for producing expanded metal lath the combination with expanding means which operates on a blank of determined length and in its operation produces a cross section having displaced components; means for widening and cross sectionally straightening such blank consisting of elements to engage the same, mechanism for reciprocating said elements longitudinally and mechanism for increasing the relative spacing of the elements during their forward longitudinal movement; and means engaging the blank at the completion of the widening and cross section straightening operation for withdrawing it longitudinally from and out of engagement with said elements.

4. Means for widening and cross sectionally straightening an expanded metal blank having a displaced cross section comprising a stationary housing, a carriage frame slidably mounted on said housing, means for reciprocating said carriage frame, elements carried by said frame for engaging the blank and mechanism for relatively laterally separating said elements to effect the widening and straightening of the blank.

5. Means for widening and cross sectionally straightening an expanded metal blank having a displaced cross section comprising a stationary housing, a carriage frame slidably mounted on said housing, means for reciprocating said carriage frame, elements carried by said frame for engaging the blank, mechanism for relatively laterally separating said elements to effect the widening and straightening of the blank and means for maintaining a uniform increase in the spacing between said elements.

6. Means for widening and cross sectionally straightening an expanded metal blank having a displaced cross section comprising a stationary housing, a carriage frame slidably mounted on said housing, means for reciprocating said carriage frame, elements carried by said frame for engaging the blank, mechanism for relatively laterally separating said elements to effect the widening and straightening of the blank and means for maintaining the same relative longitudinal positions of said elements.

7. Means for widening and cross sectionally straightening an expanded metal blank having a displaced cross section comprising a stationary housing, a carriage frame slidably mounted on said housing, means for longitudinally reciprocating said frame, elements carried by said frame for engaging the blank and mechanism for relatively laterally separating said elements during the movement of said frame in one direction to effect the widening and straightening of said blank.

8. Means for widening and cross sectionally straightening an expanded metal blank having a displaced cross section comprising a stationary housing, a carriage frame mounted for longitudinal movement on said housing, means for reciprocating said frame, elements carried by said frame for engaging said blank, stationary diverging guides secured to said housing, and mechanism movable with the frame and co-operating with the guides, said mechanism being connected to said elements whereby to effect their relative lateral separation during a movement of said frame in one direction.

9. Means for widening and cross sectionally straightening an expanded metal blank having a displaced cross section comprising a stationary housing, a carriage frame mounted for longitudinal movement on said housing, means for reciprocating said frame, elements carried by the frame for engaging the blank, and mechanism for relatively laterally separating said elements to effect the widening and straightening of the blank and including a lazy tong mechanism extending transversely of and connected to said elements.

10. Means for widening and cross sectionally straightening an expanded metal blank having a displaced cross section comprising a stationary housing, a carriage frame mounted for longitudinal movement on said housing, means for reciprocating said frame, a plurality of blank engaging elements carried by said frame, stationary diverging guides secured to said housing, means movable with the frame for co-operation with said guides and including mechanism connected to said elements to effect their relative lateral separation during a movement of said frame in one direction, and transverse guides secured to the frame and adapted to maintain the same relative longitudinal positions of said elements, the latter being slidably connected to said transverse guides for transverse movement relative to the frame.

11. Means for widening and cross sectionally straightening an expanded metal blank having a displaced cross section comprising a stationary housing, a carriage frame mounted for longitudinal movement on said housing, means for reciprocating said frame, a plurality of blank engaging elements carried by said frame, stationary diverging guides secured to said housing, means movable with the frame for co-operation with said guides and including a lazy tong mechanism extending transversely of and connected to said elements to maintain a uniform increase in spacing between them, and transverse guides secured to the frame and adapted to maintain the same relative longitudinal positions of said elements, the latter being slidably connected to said transverse guides for transverse movement relative to the frame.

12. In a machine for producing expanded metal lath, in combination, means for expanding a blank and operative thereon to produce a cross section having displaced components, means for delivering the finished product, and means including reciprocatory elements operative between said expanding and delivering means to widen and cross sectionally straighten the blank and to pass it to said delivering means.

13. In a machine for producing expanded metal lath, the combination, with expanding means operative on a blank of determined length and which in its operation on such a blank produces a cross section having displaced components, of means receiving the blank from the expanding means and operative to widen and straighten it, a drive shaft, means operated by said shaft for causing an operation and a normalizing of said widening and straightening means, and means for interrupting the operative connection of said shaft and said widening and straightening means for a determined period after the latter has been restored to normal.

14. In a machine for producing expanded metal lath, the combination, with expanding means operative on a blank of determined length and which in its operation on such a blank produces a cross section having displaced components, of means receiving the

blank from the expanding means and operative to widen and straighten it, means for operating and normalizing said widening and straightening means, means to prevent the feeding of a blank to said expanding means and means for rendering said last named means inoperative at the time of the normalizing of said widening and straightening means.

15. In a machine for producing expanded metal lath the combination with expanding means operative on a blank of determined length and which in its operation on such a blank produces a cross section having displaced components, of means receiving the blank from the expanding means and operative to widen and straighten it, a drive shaft, means operated by said shaft for causing an operation and a normalizing of said widening and straightening means, means to prevent the feeding of a blank to said expanding means and means for rendering said last named means inoperative during the period that the widening and straightening means remains normalized.

In testimony whereof I hereby affix my signature.

HARRY A. KESSLER.