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J. J. MANOFSKY

2,191,433

METAL SHEET FABRICATING MACHINE

Filed Dec. 3, 1938

3 Sheets-Sheet 1

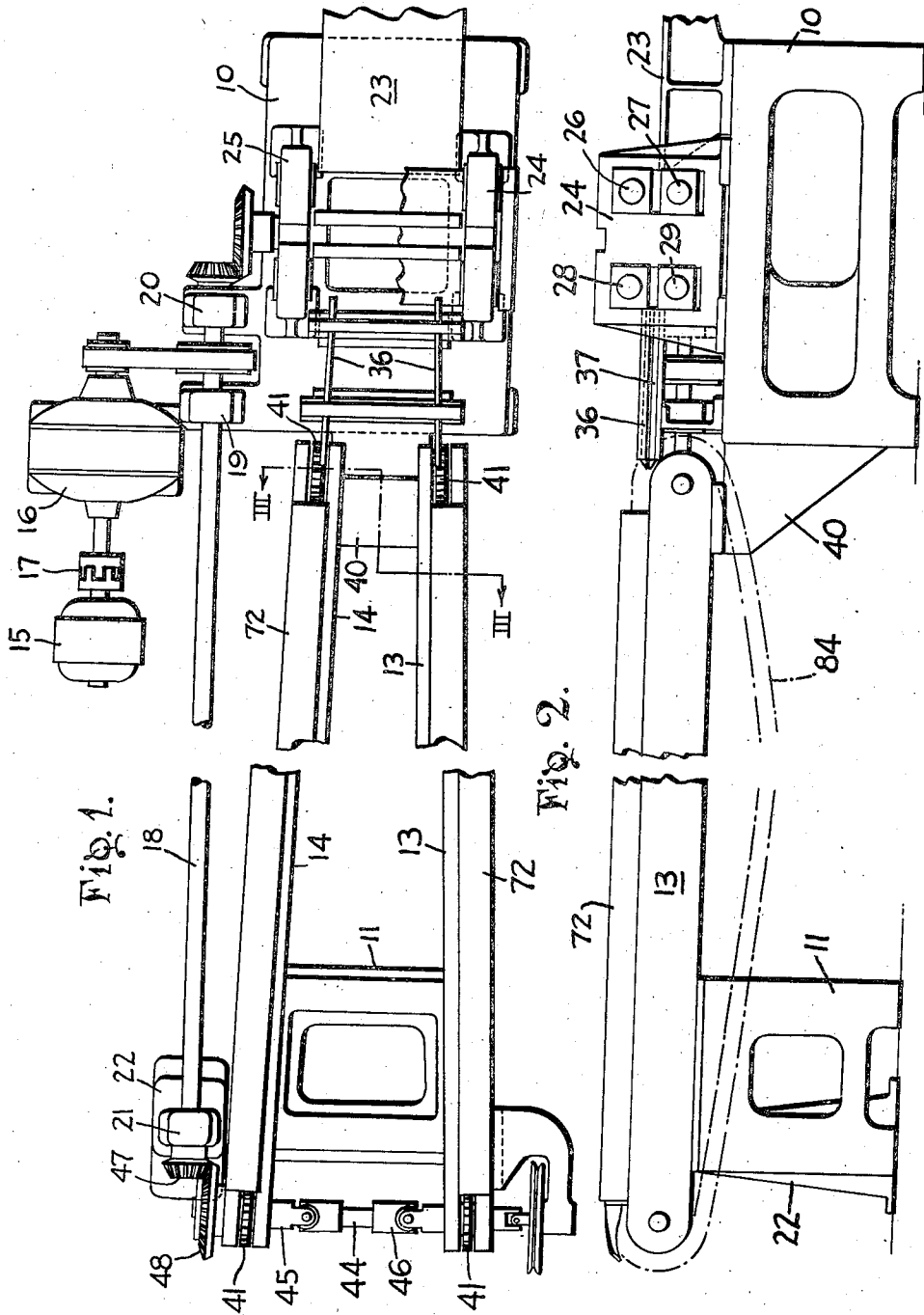


FIG. 1.

FIG. 2.

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3 Sheets-Sheet 2

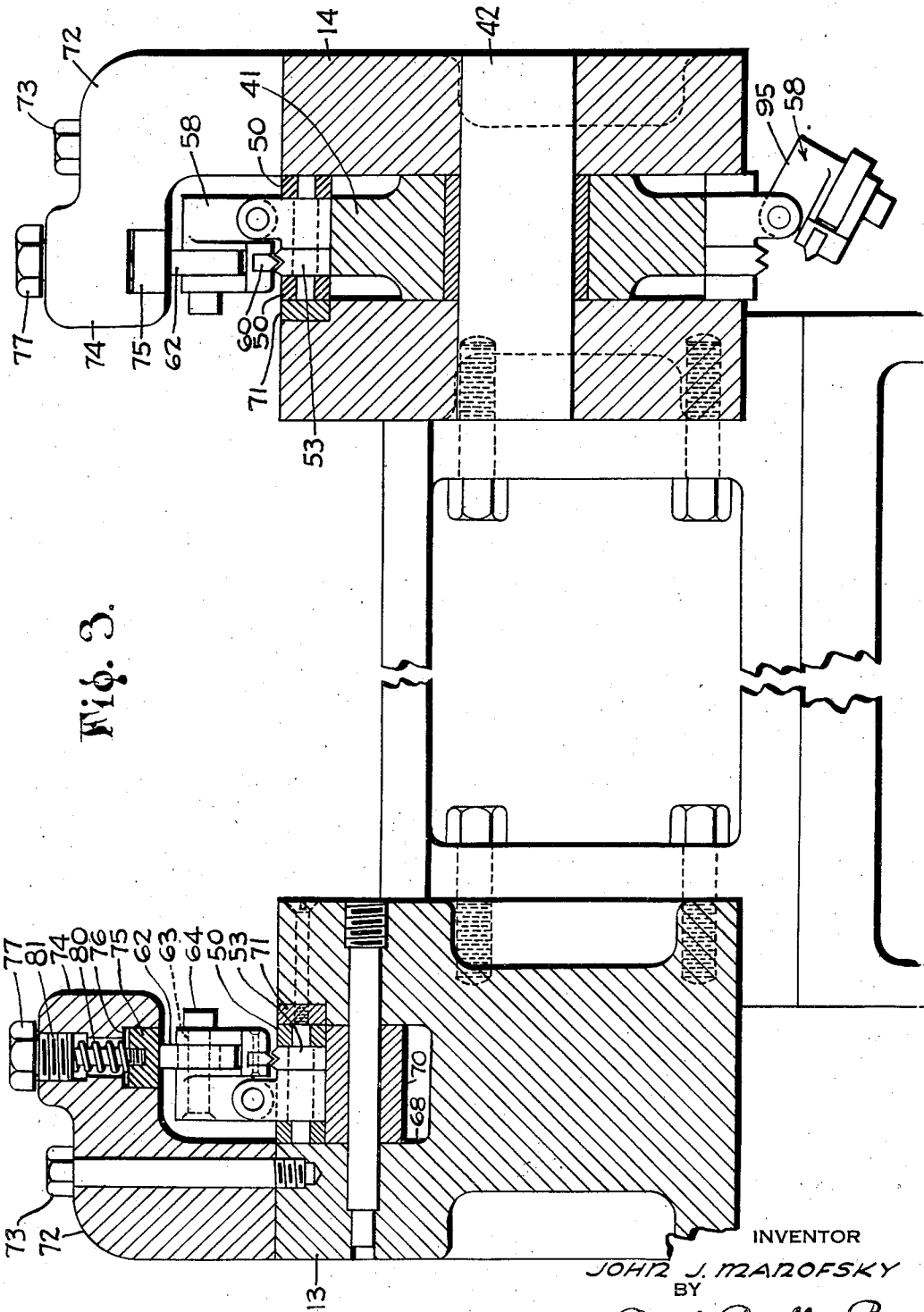


Fig. 3.

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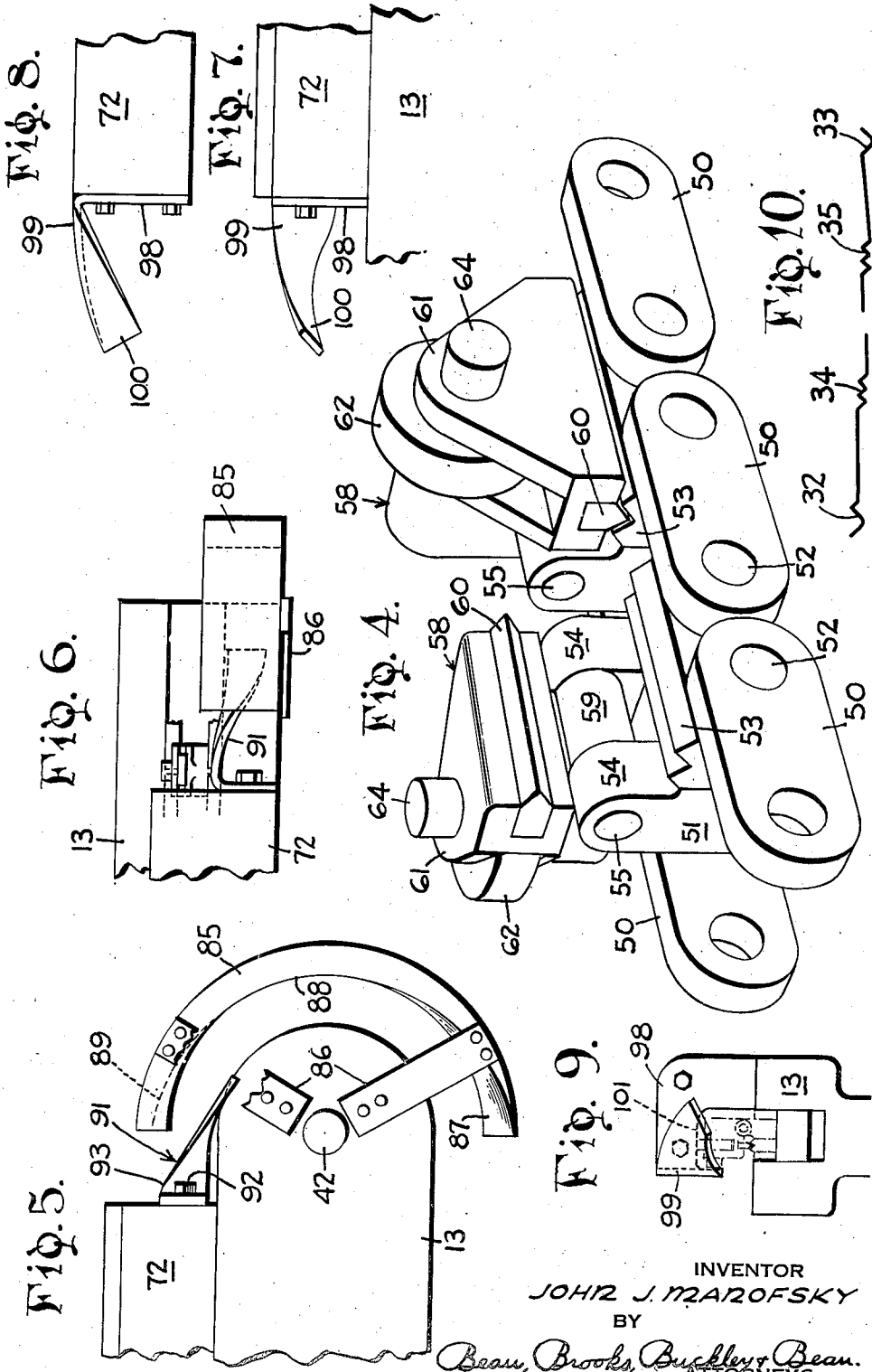
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METAL SHEET FABRICATING MACHINE

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3 Sheets-Sheet 3



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2,191,433

METAL SHEET FABRICATING MACHINE

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Application December 3, 1938, Serial No. 243,809

14 Claims. (Cl. 164—6.5)

This invention relates to a machine for fabricating metal sheets and particularly to means therewith for engaging such sheets for purposes of positioning and moving them.

5 The invention may be advantageously employed in the production of expanded metal lath. According to the generally accepted method of producing expanded metal lath a sheet of metal is first provided throughout a large part of its surface with a plurality of parallel slits, usually extending lengthwise of the sheet, and the sheet is then gripped at its opposite longitudinal edges, transversely of the extent of the slits, and stretched so that the slits open up to form a mesh.

10 The machine of the present invention is designed to effect the stretching of the sheet, or expanding as it is generally known in the art, in an improved manner by providing a machine which is adapted to grasp the edges of the sheet in a more efficacious manner than has heretofore been the case.

Further advantages of the use of my improved metal sheet expanding machine and the improved sheet engaging means will appear from a study of the drawings and the following description.

In the drawings:

Fig. 1 is a general plan view of the machine with parts broken away;

30 Fig. 2 is a general side elevational view of the machine, also with parts broken away;

Fig. 3 is a cross sectional view taken approximately on the line III—III of Fig. 1.

35 Fig. 4 is a perspective view of several of the sheet gripping elements shown both in open and in gripping position;

Fig. 5 is an enlarged elevational view of the entrance portion of the expanding mechanism showing the gripper closing device;

40 Fig. 6 is a plan view of that portion of the machine;

Fig. 7 is an elevational view of the delivery portion of the expanding mechanism showing the gripper closing device;

45 Fig. 8 is a plan view of that portion of the machine;

Fig. 9 is an end elevational view, also of that portion of the machine; and

50 Fig. 10 is a diagrammatic view showing approximately the appearance of the work sheet in cross section as it is delivered to the expanding mechanism.

In Figs. 1 and 2 the central part of the machine has been broken away to permit illustration on a larger scale.

In the drawings the numerals 10 and 11 designate base members disposed at the feed and discharge ends of the machine respectively. An intermediate base member (not shown) is preferably provided. Extending between the base members 10 and 11 are spaced beams 13 and 14, the construction and operation of which will be hereinafter described.

5 The base 10 serves as a support for forming roll mechanism which is not shown in detail since such forming roll mechanism is conventionally found in machines of the kind under consideration and the forming roll mechanism enters into the present invention only insofar as it produces sheets of a certain form for introduction into the expanding mechanism.

10 Actuation of the entire machine may be effected by means of an electric motor 15 which engages a conventional speed reducing unit 16 through the medium of a flexible coupling 17. A drive shaft 18 extends longitudinally of the machine and is journaled at one end in bearings 19 and 20 carried by the base 10. The other end of the drive shaft 18 is journaled in a bearing 21 which in the drawings is supported by a pedestal 22.

25 Disposed upon the right hand end of the base member 10 as viewed in Figs. 1 and 2 is an element 23 having a flat top which serves as a table upon which previously slit work sheets are placed for introduction to the machine.

30 Adjacent the table member 23 are a pair of spaced bearing members 24 and 25 which are adapted to give support to a plurality of forming rolls. The forming rolls themselves are not included in Fig. 1 of the drawings but their number and disposition is adequately indicated, for the purpose of exemplification, in Fig. 2, where the journals of two pairs of rolls, 26, 27 and 28, 29, with their associated bearing blocks, appear. The two pairs of rolls preferably constitute two passes wherein grooves extending longitudinally of the work sheet are formed. These grooves are primarily formed in the work sheet to lend added stiffness to the ultimate product and for other structural reasons, but utilization of their presence in the unexpanded work sheet is made to the end that the work sheet may be securely and efficaciously clamped during the expanding operation.

55 The work sheet is impressed, in its passage between the forming rolls, with a number of longitudinally extending V-shaped corrugations. One such corrugation will appear along each marginal edge and one or more corrugations may occur at medial points across the sheet. In the

present invention we are immediately concerned only with the marginal corrugations. The appearance of the work sheet in cross section immediately after its issuance from the forming rolls and before the expanding operation is illustrated more or less diagrammatically in Fig. 10 where the numerals 32 and 33 denote the marginal corrugations referred to. Any number of intermediate corrugations for further stiffening the sheet may be provided as illustrated at 34 and 35.

As the corrugated work sheets emerge from the forming roll portion of the machine they ride between upper and lower pairs of guide bars which engage the marginal corrugations. The upper guide bars are designated at 36 and the lower guide bars at 37. The guide bars are so arranged that they diverge in a direction away from the forming roll mechanism and in a horizontal plane. This divergence is for a purpose which will hereinafter appear.

Bracket 40 is either secured to or formed upon the pedestal or base member 10 and gives support to one end of each of the beams 13 and 14, their other ends being, as previously stated, disposed upon the other base member 11. An intermediate pedestal or base member is preferably employed but this is done for added strength only, does not vary the operation of the present invention, and has not been illustrated in the drawings, being broken away in Figs. 1 and 2. As may be noted in the plan view, Fig. 1, the beams 13 and 14 are substantially divergent in a direction away from the forming rolls which are carried by the base member 10.

In Fig. 3 the cross section of the left hand beam 13 is shown taken at some intermediate point and the cross section of the right hand beam 14 is taken adjacent its end where it gives support to a sprocket wheel 41. Similar sprocket wheels are provided in association with each end of each of the beams 13 and 14. The sprocket wheels at the ends adjacent the base member 10 are disposed for idling rotation upon the stub shafts 42 which are journaled in the beams 13 and 14 as is shown in Fig. 3.

The sprockets at the other ends of the beams 13 and 14 are connected for joint rotation by a shaft 44, see Fig. 1, a pair of conventional universal joints 45 and 46 being interposed because each of the sprockets rotates upon an axis at right angles to its associated beam and the pair of sprockets at each end of the machine are consequently not coaxial.

One of the sprockets at the left hand end of the machine as seen in Figs. 1 and 2 is connected to the drive shaft 18 by means of a pair of bevel gears 47 and 48.

The chain which is associated with the sprockets 41 is of special construction and forms an important part of the present invention. The chain is shown in cross section in Fig. 3 and several links of the chain are shown in perspective in Fig. 4. The chain resembles a driving chain generally in that it is provided with pairs of side links 50 and center links 51 which pivotally connect each pair of side links with an adjacent pair of side links by means of pivot pins 52. The center links 51, however, are in the present invention of novel form and embody means for selectively clamping the edges of work sheets in a manner which will appear from the following description.

Each center link 51 has rigidly associated with it a hardened steel block 53 having a corrugated

upper surface, which corrugations are formed to match the under surface of the corrugated edge of a work sheet such as the one illustrated in Fig. 10. The block 53 may be satisfactorily held in assembly with the center link 51 by the pivot pins 52 which extend through the side and center links 50 and 51 respectively.

An upward extension of each center link 51 is formed to provide a pair of aligned bearings 54, which, through the medium of a bearing pin 55 which extends lengthwise of the chain, pivotally supports a movable element 58, the movable element being provided for this purpose with a suitable bearing portion 59. In Fig. 4 two such movable elements 58 are shown, the first one from the left being open and the second from the left being in closed or clamping position.

Each movable element 58 has secured thereto or therein an insert 60, preferably of hardened steel, which has a downwardly disposed V-shaped projection which is complementary with respect to the corrugated block 53 and is adapted to cooperate therewith to engage and clamp the corrugated edge of a work sheet when the movable element is in the position shown at the right of Fig. 4.

Spaced upwardly extending bearing portions 61 are further provided upon the movable element 58 and between them a roller 62 is rotatably disposed. The bearing pin 63 for the roller has a projection 64 which serves as a sort of cam follower in the opening and closing movements of the elements 58 in a manner which will hereinafter appear. The purpose and function of the roller 62 which is associated with each movable element 58 will also become evident further on in this specification.

The sprocket wheels 41, which for simplicity are not shown in elevation in the drawings, are of usual construction with teeth which fit and enter the openings in the chain. These openings lie between each adjacent pair of center links 51 and are further defined by each cooperating pair of side links 50.

The beams 13 and 14 have in their upper surfaces longitudinally extending grooves or channels 68 which, in the illustrated embodiment, extend the entire length of each beam. The lower or relatively stationary portions of the chain, comprising the side and center links, are adapted to travel in this channel and be guided by the walls thereof. To avoid the necessity for replacing the beams when wear occurs as well as to facilitate accurate manufacture in the first instance, lower and side wear plates or blocks 70 and 71 respectively are preferably disposed in the channel 68.

An elongate element 72 of overhanging cross section is fixed along the top of each of the beams 13 and 14 as by screws 73. The overhanging portion 74 of each of these elements is so located as to overlie its associated chain and means are provided on the former for engagement with the latter for the purpose of keeping the clamping instrumentalities in closed or clamping position during certain periods of operation. To further this objective a longitudinally extending pressure bar 75 is associated with the under side of each overhanging portion 74 and in the illustrated instance is set into a longitudinal groove 76 provided therefor in the overhanging portion 74. Screws 77 are disposed in apertures in the overhanging portion 74 and their threads engage the bar 75. The screws 77 have free axial sliding movement with respect to the

overhanging portion 74 and their length is such that when the bottom of the pressure bar 75 engages the tops of rollers 62 of the chain the heads of the screws are spaced slightly from the top of the overhanging portion 74. A coil spring 80 surrounds the shank of each screw 77, bearing at its lower end against the top of the pressure bar 75 and at its upper end against the bottom of a headless screw 81 which is threaded into the overhanging portion 74.

By the means described the pressure bar is caused to exert a resilient downward pressure upon the rollers 62 as they pass therebeneath and thereby hold the movable elements 58 of the chain in closed position with the edge of a work sheet securely clamped thereby.

The general scheme of operation of the present invention is as follows. The work sheet, after having the edge corrugations formed therein in the forming roll unit carried by the base 10 as has previously been described, emerges therefrom and passes to the chain means where the edge corrugations of the sheet pass onto and in registry with the corrugations upon the upper surface of the block 53 of a chain link while such link is in the condition illustrated at the left of Fig. 4. As the chain moves along the clamping means of the link is automatically closed and this procedure repeats continuously as successive links present themselves to the work sheet.

Owing to the diverging path pursued by the chains at the opposite sides of the machine, in their travel from the sprockets 41 at the forming roll end of the machine to the sprockets at the delivery end of the machine, the previously slit work sheet which is held at its edges by the clamping means of the chain links is caused to expand in the direction of its width, in a manner well understood in the art, to form a sheet of expanded metal lath.

Adjacent the delivery end of the machine further automatic means are provided for opening the clamping means associated with each chain link successively as they reach such automatic means and the means at each end of the machine for so automatically closing and opening the clamping means will now be described.

Figs. 5 and 6 are fragmentary elevational and plan views respectively of the portion of the expanding mechanism which lies adjacent the forming roll mechanism and which first receives the work sheet therefrom. For simplicity neither the chain itself nor the sprocket is shown in these figures. An end of the beam 13 is shown and associated therewith the sprocket shaft 42. A semicircular cam ring 85 is supported in substantially concentric relation with the sprocket and sprocket shaft 42 by brackets 86 secured to the ends of the beam 13.

The cam ring 85 is of generally uniform thickness in the direction of its radius but its lower portion is thinner at the outside, forming the angularly disposed cam face 87 which merges with the inner truly circular face 88 of the cam ring and at its upper end the cam ring is thinner at the inside as is indicated by the dotted line 89 to form an angularly disposed cam face which is opposite in inclination to the lower cam face portion 87.

As the lower reach of the chain, indicated in dot and dash lines at 84 in Fig. 2, approaches the cam ring, in a direction from left to right as seen in Figs. 5 and 6, the movable elements 58 of the chain occupy approximately the position shown in the lower right hand corner of Fig. 3, being

so disposed by the force of gravity. The chain link moves into contact with the cam ring with the radial face at the end of the follower pin 64 riding against the angularly disposed portion 87 of the cam face.

As the chain moves about the sprocket the cam-contacting face at the pin 64 reaches the flat portion 88 of the cam face and the movable portion 58 of the chain link is consequently held in the position shown at the left of Fig. 4, that is, in a position where it has been pivotally moved through ninety degrees from a fully closed position. Subsequent to this opening movement of the element 58 the lateral face of the element 58 which lies opposite the pin 64 passes into contact with flat upper face 90 at the extremity of a bracket 91. Such lateral face of the element 58 is indicated at 95 in the lower right hand corner of Fig. 3.

The bracket 91 may be secured to the end of the element 72 as by means of the screw 92 and the bracket has an inner vertically extending portion 93, the bracket being twisted so that the inner vertically extending portion merges into the outer somewhat horizontally extending portion. The relieved surface of the cam ring 85 indicated by the dotted line 89 is really only for clearance since the pivotal movements of the movable element 58 are controlled by the cam bracket 91 as soon as the flat face 95 of the movable element 58 rides onto the flat extremity 90 of the bracket 91.

As the chain link progresses the contact of the camming face of the bracket 91 with the portion 95 of the element 58 rotates the movable element through ninety degrees to the closed position indicated at the top of Fig. 3, the work sheet having by this time been fed onto the lower clamping elements 53 of the chain. The chain links then pass beneath the overhanging portion 74 of the element 72 where the rollers 62 are engaged by the pressure bar 75 in a manner which has previously been described. To simplify the drawings, the clamp closing instrumentalities of Figs. 5 and 6 have been omitted from Figs. 1 and 2.

After the chains have traversed the entire length of the diverging beams 13 and 14 and as each link is about to engage its associated sprocket at that end of the machine, it is engaged by cam means for opening the work sheet clamping device. Such means are shown in Figs. 7, 8 and 9 and comprise a bracket 98 secured to the end of each element 72 and having a flat extension thereon which is disposed vertically adjacent its base portion as at 99 and which is twisted outwardly so that at its extremity it extends almost horizontally as at 100.

As may be seen from an inspection of Fig. 9, there is a notch 101 in the bottom of the fastening flange of the bracket 98 through which each link passes as it emerges from beneath the overhanging portion 74 of the member 72. In so emerging the radial face of the pin 64 of each movable element 58 of a chain link comes into camming contact with the substantially vertically extending portion 99 of the cam bracket 98. It will be obvious that further forward movement of the link will, by virtue of the camming action of the portions 99 and 100 of the cam bracket 98, cause the movable elements 58 of the successive links to be pivoted to an open or non-clamping position, whereupon the work sheet moves out of contact with the gripping means at the sprocket and continues its forward motion in a

straight line as the chain elements follow each other around the sprocket.

I find that highly successful operation results when the sprockets are driven at a speed which gives to the chain elements a surface speed which is approximately two per cent greater than the surface speed imparted to the work sheets by the forming roll mechanism. This difference results in some slipping of the work sheet in the clamping mechanism but gives to the work sheet while in the clamping mechanism a lengthwise tension which results in a much improved final product and one which is free from troublesome surface irregularities which have long been a problem in producing expanded metal lath.

It will be noted that the work sheet is gripped by an actual mechanical interlock so far as its transverse dimension is concerned but is only frictionally gripped in the direction of its length. This system of gripping permits the aforementioned sheet tensioning to be accomplished with facility and without reducing the certainty of gripping in the direction of the width of the sheet where, of course, the tensile stress is by far the greatest and where any slipping will result in an imperfect product.

While a single preferred embodiment of my invention has been illustrated it is not to be considered that my invention is limited thereby or in any other way save as defined in the appended claims.

What is claimed is:

1. In a machine for producing expanded metal sheets, chain means for gripping and conveying pre-slit work sheets having longitudinally extending marginal corrugations, said chain being made up of alternate and pivotally connected center links and pairs of side links, said center links each having a body portion pivotally connected to adjacent side links at each end thereof and a second portion movably associated therewith, said body portion and second portion cooperating to selectively clamp or release a work sheet by interlocking engagement with the marginal corrugations thereof.

2. In a machine for producing expanded metal sheets from pre-slit work sheets having longitudinally extending marginal corrugations, a pair of gripping and driving chains arranged in spaced relation for cooperation one with each longitudinal edge of the work sheet and a pair of sprockets associated with each chain, said chains extending in diverging directions whereby a work sheet is compelled to assume a constantly increasing width as it is moved along by said driving chains with its opposite longitudinal edges engaged thereby, each of said chains comprising alternate side and center links pivotally interconnected with their pivotal axes extending parallel to the axes of their associated sprockets, some of said links having clamping elements movably associated therewith for pivotal movement along an axis extending parallel to the path of said chain and adapted to cooperate with their associated links to engage the marginal corrugation of the work sheet and thereby form releasable clamps.

3. In a machine for producing expanded metal sheets from work sheets having longitudinally extending marginal deformations, a pair of gripping and driving chains arranged in spaced relation for cooperation one with each longitudinal edge of the work sheet and a pair of sprockets associated with each chain, said chains extending in diverging directions whereby an engaged

work sheet is compelled to assume a constantly increasing width as it is moved along by said driving chains, each of said chains comprising a plurality of link elements interconnected for pivotal movement about axes extending parallel to the axes of their associated sprockets, some of said links having clamping elements movably associated therewith for pivotal movement along an axis extending substantially parallel to the path of said chain and adapted to cooperate with their associated links to engage the marginal deformation of the work sheet and thereby form releasable clamps.

4. In a machine for producing expanded metal sheets, a pair of gripping and driving chains arranged in spaced relation for cooperation one with each longitudinal edge of a work sheet having pre-formed marginal corrugations and a pair of sprockets associated with each chain, said chains extending in diverging directions whereby an engaged work sheet is compelled to assume a constantly increasing width as it moves along by said driving chains, each of said chains comprising a plurality of interconnected link elements, some of said links having clamping elements movably associated therewith for pivotal movement along an axis extending parallel to the path of said chain and adapted to cooperate with their associated links to form releasable clamps for interlocking engagement with the marginal corrugations of the work sheet, guide means extending along one reach of each of said chains for engaging said chains when said means are in clamping relation, said guide means having opposed faces for engaging opposite sides of the stationary and movable portions of the clamping links to confine such stationary and movable portions and thereby prevent their separation during substantially the entire period of the passage of the sheet between said diverging chains.

5. In a machine for producing expanded metal sheets from pre-slit work sheets having longitudinally extending marginal corrugations, a driving chain for said sheets comprising a series of links successively interconnected for pivotal movement about axes extending at right angles to their line of travel, some of said links having corrugations in their upper faces extending in the direction of travel of said chain and adjacent thereto pairs of spaced coaxial bearing portions having their common axis extending in the direction of travel of said chain, a movable element having a bearing portion disposed between each such pair of spaced bearing portions, a pivot pin connecting said movable portion with its associated link for pivotal movement, the under face of said movable element having a face which is complementary with respect to the corrugations in the upper face of said link and the formation of both said faces being such as interlock with the marginal corrugation of a work sheet when said movable element is pivoted to bring its lower face toward the upper surface of its associated link.

6. In a machine for producing expanded metal sheets from pre-slit work sheets having longitudinally extending marginal corrugations, a driving chain for said sheets comprising a series of longitudinally overlapping links successively interconnected for pivotal movement about axes extending at right angles to their line of travel, alternate links being substantially contiguous owing to said overlapping arrangement and each alternate link having spaced coaxial bearing por-

tions with their common axis extending substantially in the direction of travel of said chain, a movable element having a bearing portion disposed between said spaced bearing portions, and a pivot pin connecting said movable element with the bearing portions of its associated link for pivotal movement, said movable element and its associated link having complementary opposed longitudinal corrugations for engaging the upper and under sides respectively of the marginal portion of said work sheets for interlocking engagement with the marginal corrugations thereof.

7. In a machine for producing expanded metal sheets from pre-slit work sheets having longitudinally extending marginal corrugations, a driving chain for said sheets comprising a series of longitudinally overlapping links successively interconnected for pivotal movement about axes extending at right angles to their line of travel, alternate links being substantially contiguous owing to said overlapping arrangement and each alternate link having spaced coaxial bearing portions with their common axis extending substantially in the direction of travel of said chain, a movable element having a bearing portion disposed between said spaced bearing portions, and a pivot pin connecting said movable element with the bearing portions of its associated link for pivotal movement, said movable element and its associated link having complementary opposed longitudinal corrugations for engaging the upper and under sides respectively of the marginal portion of said work sheets for interlocking engagement with the marginal corrugations thereof, the corrugation of said link extending substantially the full length thereof and the corrugated portion of said movable element being of substantially the same length as said link whereby the work sheets are interlockingly engaged along a major portion of their longitudinal extent when in engagement with said chain means.

8. In a machine for producing expanded metal sheets from pre-slit work sheets having longitudinally extending marginal corrugations, a driving chain for said sheets comprising a series of links successively interconnected for pivotal movement about axes extending at right angles to their line of travel, some of said links having corrugations in their upper faces extending in the direction of travel of said chain and bearing portions having an axis extending substantially parallel to said corrugations, movable elements associated with said bearing portions for pivotal movement with respect to said links, the under face of each movable element having a face which is complementary with respect to the corrugations in the upper face of its associated link and the formation of said upper and lower faces being such as to interlock with the marginal corrugation of a work sheet when said movable element is pivoted to bring its lower face toward the upper surface of its associated link.

9. In a machine for producing expanded metal sheets from pre-slit work sheets having longitudinally extending marginal corrugations, a driving chain for said sheets comprising a series of links successively interconnected for pivotal movement about axes extending at right angles to their line of travel, some of said links having corrugations in their upper faces extending in the direction of travel of said chain and bearing portions having an axis extending substantially parallel to said corrugations, movable elements associated with said bearing portions for pivotal

movement with respect to said links, the under face of each movable element having a face which is complementary with respect to the corrugations in the upper face of its associated link and the formation of said upper and lower faces being such as to interlock with the marginal corrugation of a work sheet when said movable element is pivoted to bring its lower face toward the upper surface of its associated link, a longitudinally extending track upon which the chain is supported and an overhanging portion associated therewith, and anti-friction means at the upper side of said movable elements for contact with the under face of said overhanging portion to insure positive interlocking between said links, said movable elements, and the marginal corrugations of said sheets during the passage of the chain along said track.

10. In a machine for producing expanded metal sheets from pre-slit work sheets having longitudinally extending marginal corrugations, a driving chain for said sheets comprising a series of links successively interconnected for pivotal movement about axes extending at right angles to their line of travel, some of said links having corrugations in their upper faces extending in the direction of travel of said chain and bearing portions having an axis extending substantially parallel to said corrugations, movable elements associated with said bearing portions for pivotal movement with respect to said links, the under face of each movable element having a face which is complementary with respect to the corrugations in the upper face of its associated link and the formation of said upper and lower faces being such as to interlock with the marginal corrugation of a work sheet when said movable element is pivoted to bring its lower face toward the upper surface of its associated link, a longitudinally extending track upon which the chain is supported, and resilient means associated therewith and disposed to overlie said chain and engage the upper portion of said movable elements to resiliently maintain associated links and movable elements in interlocking engagement with the marginal corrugations of said sheet.

11. In a machine for producing expanded metal sheets from pre-slit work sheets having longitudinally extending marginal corrugations, a driving chain for said sheets comprising a series of links successively interconnected for pivotal movement about axes extending at right angles to their line of travel, some of said links having corrugations in their upper faces extending in the direction of travel of said chain and bearing portions having an axis extending substantially parallel to said corrugations, movable elements associated with said bearing portions for pivotal movement with respect to said links, the under face of each movable element having a face which is complementary with respect to the corrugations in the upper face of its associated link and the formation of said upper and lower faces being such as to interlock with the marginal corrugation of a work sheet when said movable element is pivoted to bring its lower face toward the upper surface of its associated link, a longitudinally extending track upon which the chain is supported and resilient means associated therewith and disposed to overlie said chain, and anti-friction means associated with each of the movable elements and adapted to be engaged by said resilient means, said track and said resilient means cooperating to maintain associated links and movable elements in interlocking engage-

ment with marginal corrugations of said sheet during the passage of the chain along said track.

12. In a machine for producing expanded metal sheets from pre-slit work sheets having
 5 longitudinally extending marginal corrugations, a driving chain for said sheets comprising a series of links successively interconnected for pivotal movement about axes extending at right
 10 angles to their line of travel, some of said links having corrugations in their upper faces extending in the direction of travel of said chain and bearing portions having an axis extending substantially parallel to said corrugations, movable elements associated with said bearing portions
 15 for pivotal movement with respect to said links, the under face of each movable element having a face which is complementary with respect to the corrugations in the upper face of its associated link and the formation of said upper
 20 and lower faces being such as to interlock with the marginal corrugation of a work sheet when said movable element is pivoted to bring its lower face toward the upper surface of its associated link, a longitudinally extending track upon which
 25 the chain is supported and an overhanging portion associated therewith, said overhanging portion contacting said movable elements and cooperating with said track to maintain positive interlock between said links, said movable elements, and the marginal corrugations of said
 30 sheet during the passage of the chain along the track, and means disposed at opposite ends of said track for moving each movable element into interlocking engagement with its associated link
 35 and the work sheet prior to its entry upon the track and for releasing each movable element from such interlocking engagement upon its exit from said track.

13. In a machine for producing expanded metal sheets, means for forming marginal longitudinally extending corrugations, said means including means for feeding said sheets through said forming means at a predetermined rate of speed,
 5 mechanism for expanding said sheets including a driving chain for receiving said sheets from said forming means and for moving the same through the expanding mechanism by frictional engagement and means interrelating said feeding
 10 means and said driving chains to cause the latter to move faster than the former by a predetermined fractional amount whereby predetermined longitudinal tension is imparted to said sheets upon entry to the expanding mechanism.
 15

14. In a machine for producing expanded metal sheets, means for forming marginal corrugations, said means including means for feeding said sheets longitudinally through said forming means
 20 at a predetermined rate of speed, means for expanding said sheets including driving chains for receiving said sheets from said forming means and for moving the same through the expanding means, said driving chains having complementary
 25 gripping elements adapted to engage the upper and lower sides of said sheets at said marginal corrugations whereby said sheet is interlockingly held in a transverse direction and frictionally held in its longitudinal direction, means for interrelating the driving speeds of the drive means
 30 associated with the forming mechanism and the driving chains to cause the latter to move faster than the former in a predetermined degree whereby predetermined longitudinal tension is imparted to said sheets upon entry to the expanding mechanism.
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