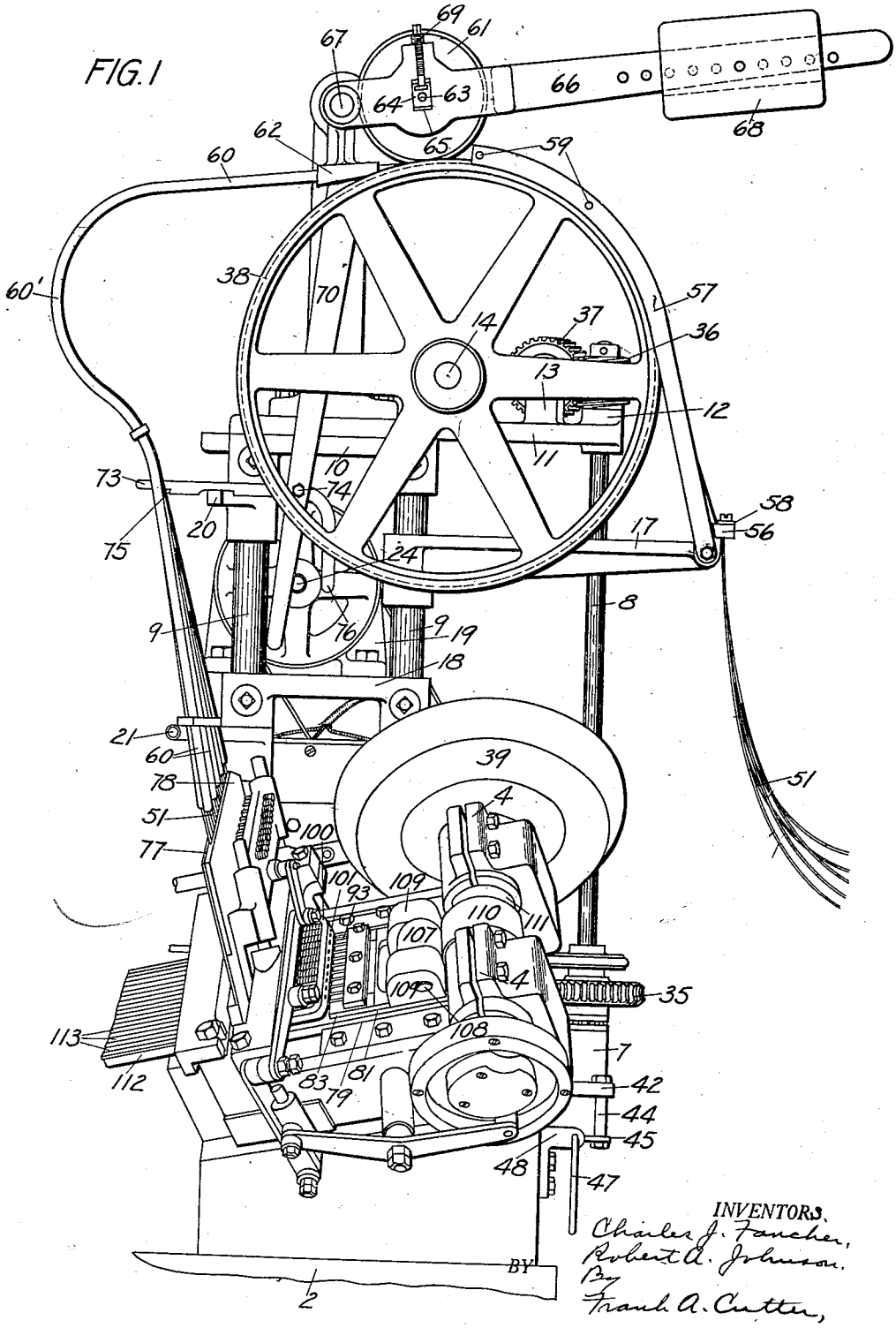
May 19, 1931. C. J. FANCHER ET AL 1,806,154

STRIP FEEDING MECHANISM

Original Filed Jan. 12, 1927 4 Sheets-Sheet 1

FIG. 1



INVENTORS.
Charles J. Fancher,
Robert A. Johnson.
By
Frank A. Cutter,
ATTORNEY.

May 19, 1931. C. J. FANCHER ET AL 1,806,154

STRIP FEEDING MECHANISM

Original Filed Jan. 12, 1927 4 Sheets-Sheet 2

FIG. 1

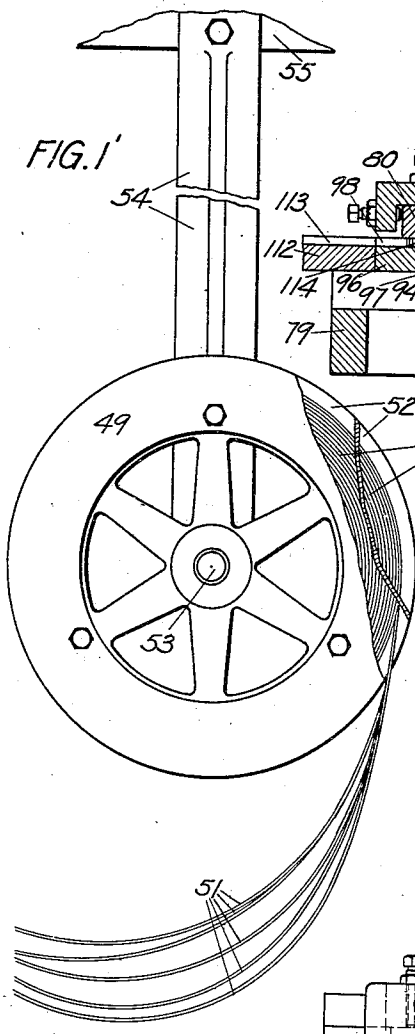


FIG. 2

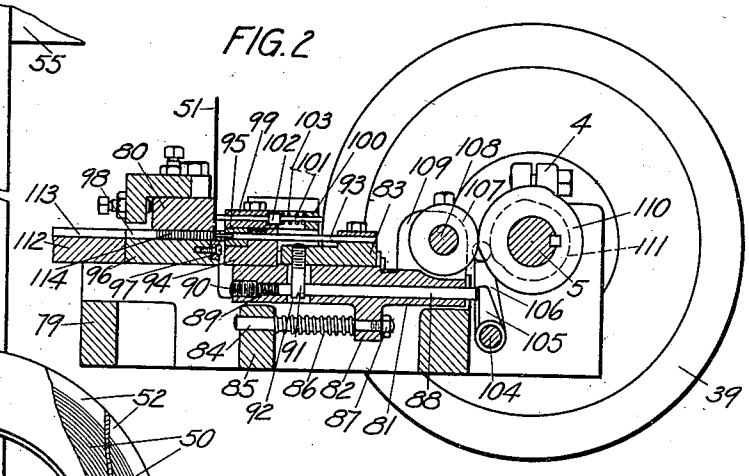


FIG. 3

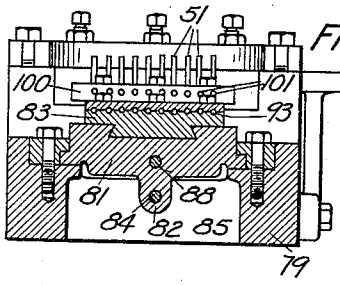
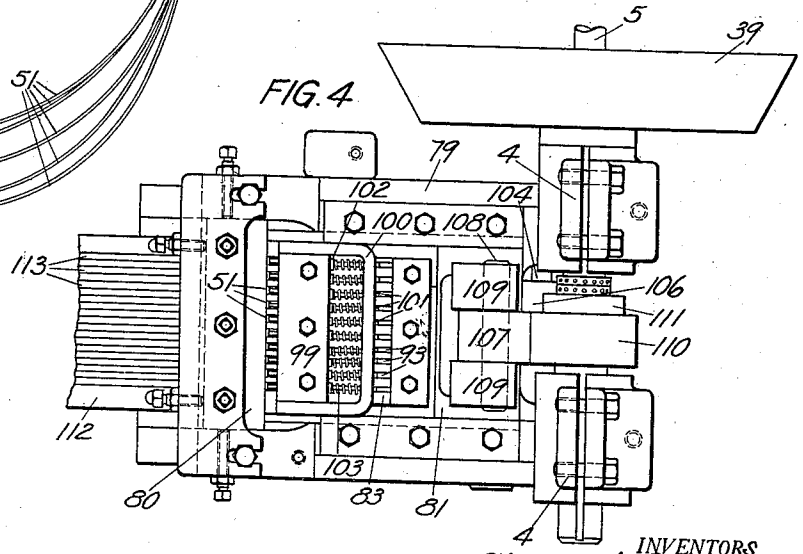


FIG. 4



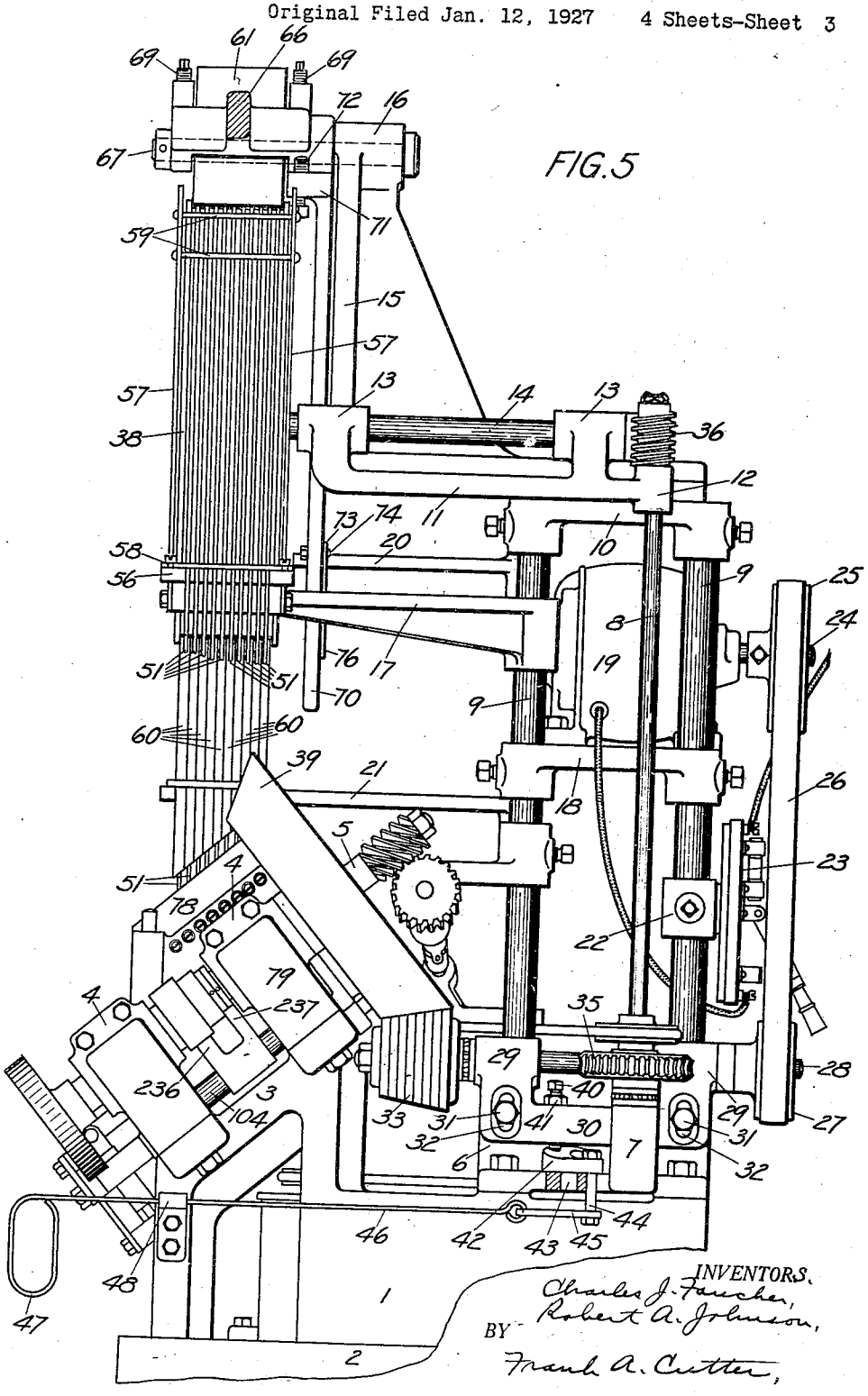
INVENTORS.
Charles J. Fancher,
Robert A. Johnson,
BY Frank A. Cutter,
ATTORNEY.

May 19, 1931. C. J. FANCHER ET AL 1,806,154

STRIP FEEDING MECHANISM

Original Filed Jan. 12, 1927 4 Sheets-Sheet 3

FIG. 5



INVENTORS.
Charles J. Fancher,
Robert A. Johnson,
BY
Frank A. Cutler,
ATTORNEY.

May 19, 1931. C. J. FANCHER ET AL 1,806,154

STRIP FEEDING MECHANISM

Original Filed Jan. 12, 1927 4 Sheets-Sheet 4

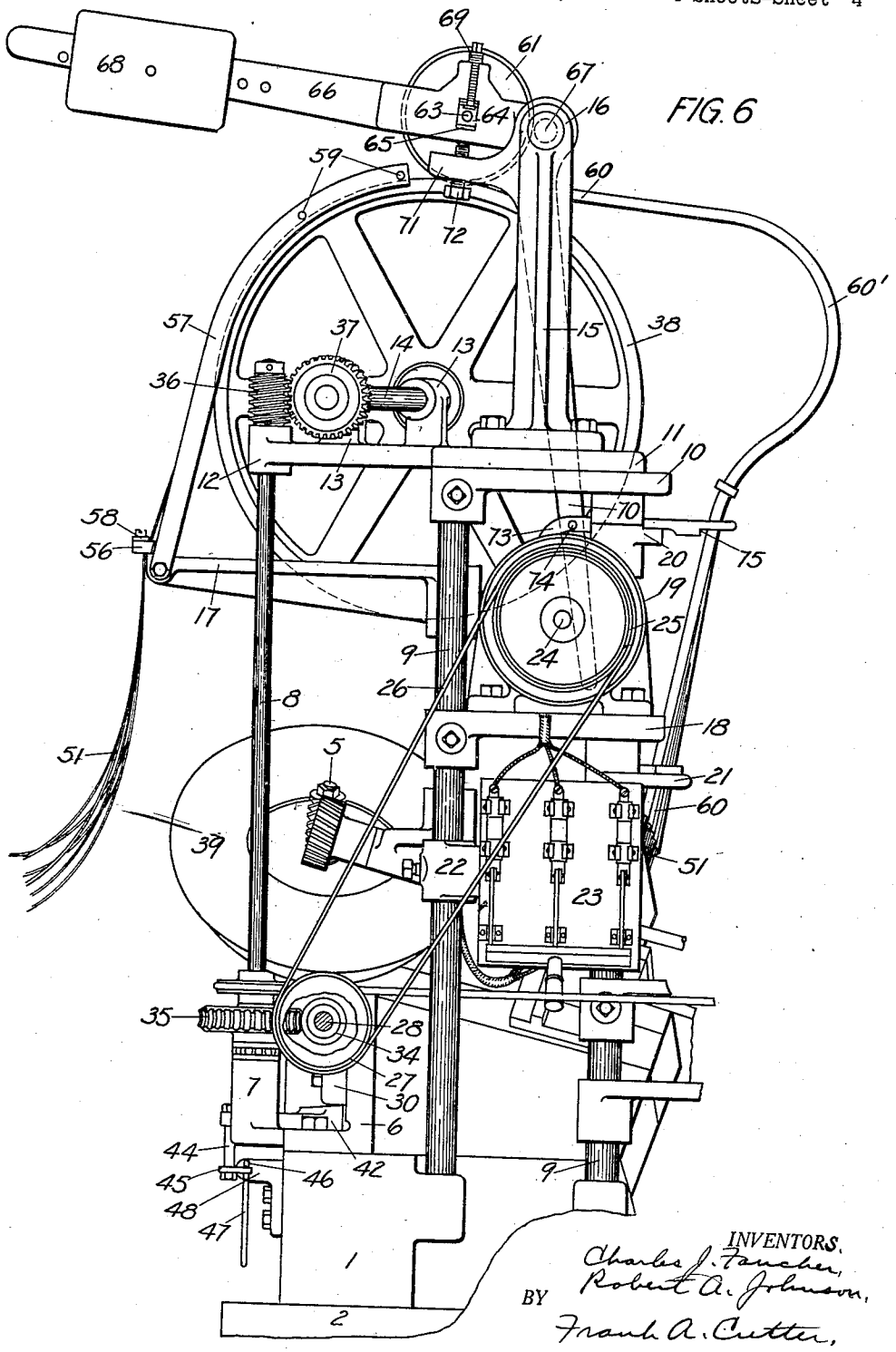


FIG. 6

INVENTORS.
Charles J. Fancher,
Robert A. Johnson,
BY Frank A. Cutter,
ATTORNEY.

Patented May 19, 1931

1,806,154

UNITED STATES PATENT OFFICE

CHARLES J. FANCHER, OF WINDSOR, VERMONT, AND ROBERT A. JOHNSON, OF LONGMEADOW, MASSACHUSETTS, ASSIGNORS, BY MESNE ASSIGNMENTS, TO WOODWARD, HUBBARD COMPANY, OF HILL, NEW HAMPSHIRE, A CORPORATION OF NEW HAMPSHIRE

STRIP-FEEDING MECHANISM

Original application filed January 12, 1927, Serial No. 160,639. Divided and this application filed December 21, 1927. Serial No. 241,572.

Our invention relates to improvements in mechanism for feeding strips, and particularly for feeding strips of zinc or tempered steel while being cut into glaziers' points, the same being a divisional part of our application for Letters Patent of the United States, filed January 12, 1927, Serial No. 160,639.

The primary object of our invention is to produce mechanism with which can be fed to cutting mechanism one or more metallic strips in a manner to insure precision, adequacy, and reliability, said feeding mechanism being simple both structurally and functionally.

Our feeding mechanism is designed to handle and feed ten metallic strips, but this number as applied to said mechanism may be increased or decreased without changing any essential feature of the mechanism or departing from the invention, since even a single strip might be fed thereby without making any mechanical change, or mechanism might be constructed to handle a single strip only, or to handle more than ten strips. In this connection it may be noted that, when the feeding mechanism is employed in connection with the manufacture of glaziers' points, the strips are obtained from a roll of sheet-metal stock sufficiently wide to cut therefrom the required number, as ten, of said strips each equal to the width of a diamond-shaped point between either of its opposite parallel sides. This stock is cut in a slitting machine into the ten, more or less, individual strips and rolled on large spools which are supplied as required as parts of the feeding mechanism.

Other objects and advantages will appear in the course of the following description.

A preferred embodiment of the invention, whereby we attain the objects and secure the advantages of the same, is illustrated in the accompanying drawings, and we will proceed to describe the invention with reference to said drawings, although it is to be understood that the form, construction, arrangement, etc., of the parts in various aspects are not material and may be modified without departing from the spirit of the invention.

In the drawings, in which like reference characters designate like parts throughout the several views, Figures 1 and 1′ together constitute a front elevation of feeding mechanism which embodies a practical form of our invention as aforesaid; Fig. 2 is a longitudinal, vertical section through clamping and cutting mechanisms respectively forming a part of or closely associated with the feeding mechanism; Fig. 3, a transverse, vertical section through said clamping and cutting mechanisms; Fig. 4, a top plan of said last-named mechanisms; Fig. 5, a right-hand end elevation of said feeding mechanism; and, Fig. 6, a rear elevation of said feeding mechanism.

We have illustrated our feeding mechanism in connection with or as a part of a glazier's-point machine, and will describe so much of said machine as is shown or may be necessary fully to understand said mechanism in both structure and function. It is to be understood, of course, that the strip-feeding mechanism can be applied to or used in connection with a machine or machines other than a glazier's-point machine.

A bed block 1 is supported on a table 2, a portion of said block inclining downwardly from rear to front to provide a bed 3 for a cutter-head. Mounted on the bed 3 are bearings 4 for an oblique shaft. Mounted on the bed block 1 is a bracket 6. The base of the bracket 6 is provided with a bearing 7 for the lower end of a vertical shaft 8. Having their bases firmly set in the bed block 1 are three posts 9, and these posts are rigidly connected at the top by means of a platform 10.

Secured on the platform 10 is a plate 11 which has a bearing 12 for the upper terminal of the shaft 8, and two bearings 13 for a transversely extending shaft 14. Having its base bolted to the plate 11 is a stand 15 provided at the top with a bearing 16. Mounted on and secured to the post 9 that is nearer to the right-hand end of the bed block 1 is a horizontal bracket 17 which extends obliquely forward from said posts. Secured

to the three posts 9 at a lower level than that of the bracket 17 is a platform 18 on which is mounted a motor 19. Secured to the innermost post 9 below the platform 10 is a horizontal arm 20 that extends forwardly, and secured to said post below the platform 18 is a bracket 21 which has the same general direction as said arm. Secured to the platform 10 is a support 22 having a switch 23 by means of which the electric current for the motor 19 is turned on and off.

The motor 19 has a shaft 24 which extends rearwardly, and has a pulley 25 mounted on and secured thereto. The pulley 25 is connected, by means of a belt 26, with a smaller pulley 27 mounted on and secured to a horizontal shaft 28. The shaft 28 is journaled in two bearings 29 at the top of a movable carrier 30 held against the outer side of the upstanding part of the bracket 6, by means of two bolts 31 which pass through two vertical slots 32 in said carrier, said bolts being sufficiently loose to enable the carrier to be raised and lowered. The pulley 27 is at the rear end of the shaft 28, and mounted on and secured to said shaft at the front end is a friction cone 33. Also mounted on and secured to the shaft 28, but between the bearings 29, is a worm 34. The worm 34 intermeshes with a worm-wheel 35 that is mounted on and secured to the shaft 8. Mounted on and secured to the shaft 8 above the bearing 12 is a worm 36. The worm 36 intermeshes with a worm-wheel 37 mounted on and secured to the rear end of the shaft 14, outside of the rear bearing 13. A large wheel 38 is mounted on and secured to the shaft 14 in front of the front bearing 13. Mounted on and secured to the shaft 5 is a large friction cone 39 which is driven by the friction cone 33 when in engagement with the large cone.

The carrier 30 has a vertical bolt 40 tapped into and through the horizontal part of the same, which bolt is provided with a check-nut 41 above said horizontal part. The lower, protruding end of the bolt 40 bears on a cam 42 which has a depending stem 43 that is journaled in the base of the bracket 6. The cam 42 has a tail-piece which extends outwardly or to the right, and is provided with a depending rod 44. Pivotally connected with the lower end of the rod 44 is a link 45, and pivotally connected with the forward terminal of said link is a horizontal, operating rod 46 provided at its forward end with a handle 47. The rod 46 is supported and adapted to slide in a guide lug 48 secured to the right-hand side of the bed block 1. The form of the cam 42 and the construction and arrangement of the operating members therefor are such that, when the rod 46 is drawn forwardly, said cam, through the medium of the link 45 and the rod 44, is partially rotated in the bearing for the stem 43 in a manner to permit the bolt 40, and the parts supported thereby, to descend and thus remove the friction cone 33 from engagement with the friction cone 39, and disconnect the shaft 5 from the power; and, when said first-named rod is positioned rearwardly, said cam through the same medium as before, is actuated in the opposite direction and raises said bolt and the aforesaid parts and members far enough to cause said first-named cone to engage said second-named cone, whereby said shaft is set in motion.

The slots 32 in the carrier 30 permit of the vertical movement of said carrier as just explained. This movement is comparatively slight, so that the worm 34 is not disengaged from the worm-wheel 35 during said movement, and the belt 26 is sufficiently loose to permit of said movement, but not so loose as to fail to drive the pulley 27 and the shaft 28 when the carrier 30 is in elevated position.

It will be seen that the motor shaft 24 drives the shaft 28, through the medium of the pulleys 25 and 27 and the belt 26, that said second-named shaft drives the vertical shaft 8, through the medium of the worm 34 and the worm-wheel 35, and that said vertical shaft drives the horizontal shaft 14, through the medium of the worm 36 and the worm wheel 37, and that, when the cone 33 is in engagement with the cone 39, the shaft 5 is driven.

At 49, in Fig. 1′, is represented a spool which carries ten individual rolls, two of which appear at 50, of strips 51 to be cut into objects, such as glaziers' points, said spool having partitions, two of which appear at 52, to separate said rolls from each other. The spool 49 is carried on a horizontal stud 53 set in the lower terminal of a hanger 54 which depends from an overhead support, as 55. The strips 51 pass downwardly from the right-hand side of the periphery of the spool 49, and to the left underneath said spool to a guide described below. Peferably the strips 51 are festooned below the spool 49 and the guide, because then there is sufficient slack in the strips to prevent any uneven or unequal pull on the spool, on the one hand, and any unevenness in the movement of said strips on their approach to the feed roll 38, on the other hand.

The aforesaid guide consists of a cross-piece 56 having ten slots in the left-hand side thereof, two side bars 57, a cross bar 58, and two cross rods 59. The cross-piece 56 and the side bars 57 at their lower ends are bolted to the outer end of the bracket 17, the bar 58 is bolted to the top of said cross piece, and the rods 59 connect said side bars at and adjacent to their upper terminals. The side bars 57 extend upward and curve over the wheel 38, and the rods 59 are thus located very close to the upper,

right-hand quadrant of said wheel, in position to bear on the strips 51 after they pass over said wheel, or, in any event, to retain said strips on the wheel. The strips 51 pass upwardly through the slots in the cross bar 56 onto the wheel 38, and between said wheel and the rods 59. From the top of the wheel 38 the strips 51 pass to the left into ten guide tubes 60, being fed into said tubes by said wheel aided by a leather-covered tension roll 61 which bears on said strips between the upper rod 59 and the entrance to said tubes. The tubes 60 at their upper and right-hand terminals are received in and supported by a holder 62 which is in close proximity to the bite between the wheel 38 and the roll 61. Two straps or links, one above and the other below, are provided to assist in holding or binding the tubes 60 together, and the lower link rests on the outer terminal portion of the bracket 21, which bracket extends to the left of said tubes.

The roll 61 has a shaft 63 which is journaled at each end in a block 64 located in an approximately vertical slot 65 in each arm at the rear, bifurcated terminal of a lever 66. This bifurcated terminal has a pivotal connection at 67 with the bearing 16 at the top of the stand 15. The lever 66 extends to the right from the bearing 16, and a weight 68 is adjustably mounted on said lever. The lever 66 is, therefore, by means of the roll 61, adapted to exert considerable pressure on the strips 51 where they pass over the wheel 38 and under said roll.

Inasmuch as it is desirable to vary the pressure at opposite ends of the roll 61 on the strips 51 beneath the same, the blocks 64 in the slots 65 are provided, and there is also provided for each of said blocks an adjusting screw 69, which is tapped down through the lever arm in which the block is located, to engage said block. By adjustment of the crews 69 the shaft 63 can be tilted, thereby tilting the roll 61 and causing it to bear harder at one end than at the other. The amount of adjustment here required is very slight, but without some adjustment of this kind there might be difficulty in feeding the ten strips uniformly or at the same rate of speed.

Provision is made for raising the roll 61 from the wheel 38 and maintaining said roll in elevated position, in order to facilitate the operation of inserting between said wheel and roll the strips 51 from a full spool of rolls 50, and for other purposes or reasons. To these ends are provided a lever 70 mounted at the upper end on the pivot 67, and having an arm 71 that extends beneath one of the arms at the bifurcated end of the lever 66, with an adjusting bolt 72 in said first-named arm to bear against the under side of said second-named arm, and a latch 73 pivotally connected at 74 with said first-named lever. The latch 73 extends to the left from the lever and over the arm 20, and has a notch 75 in the under side to engage the back side of said arm when the lever 70 is swung to the right to swing the lever 66 upwardly, through the medium of the arm 71 and the bolt 72. By adjusting the bolt 72 the amount of elevation given the lever 66 by means of the lever 70 can be changed. To release the lever 70 and permit the lever 66 to swing down again until the roll 61 bears on the wheel 38 or on the interposed strips 51, it is simply necessary to grasp a downwardly extending part 76 of the latch 73 and rock the notched part at 75 of said latch upwardly out of engagement with the arm 20, at the same time grasping said first-named lever and manipulating it to assist in releasing said latch and easing said roll down onto said wheel.

The ten tubes 60 are arranged side by side from front to rear of the mechanism, extend from the holder 62 to the left, then curved downwardly and to the right, as represented at 60′, and continue downwardly to within a short distance above the upper edges of plates that may be required for handling zinc or steel strips, zinc-strip-handling plates 77 and 78 being here illustrated.

The curved portions indicated at 60′ of or in the tubes 60, enable the strips 51, when of steel, to crowd forward therein and thus be kept under tension, and this natural tension of said strips assists in the feeding operation. The aforesaid curved portions are no hindrance to but rather an advantage, in feeding zinc strips, since they afford relief for the zinc strips during the clamping and cutting operations hereinafter described.

It is possible and practicable to operate this feeding mechanism successfully without either of the special feeding attachments of which mention has been made, and, if no attachment is used, the strips pass from the lower ends of the tubes 60 to the clamping and cutting mechanisms, as said strips are fed by the wheel 38 and the roll 61, and crowd forward in the tubular portions 60′, wherein the natural resiliency of the strips, especially if said strips be of steel, materially assists in their proper presentation at the places where they are cut.

The bearings 4 are parts of an inclined cutter-head bed 79 which is mounted on and secured to the inclined bed 3. The bed 79 carries cutting mechanism that includes a fixed knife 80, above which are the vertical plates 77 and 78 when present. The strips 51, after leaving the lower ends of the tubes 60, pass down between the plates 77 and 78 and against the right-hand side of the knife 80. Arranged to slide longitudinally

in the bed 79 is a carriage 81, which has a depending lug 82 in the center, another carriage 83 is mounted for longitudinal movement on the carriage 81. A horizontal rod 84 is arranged in the lug 82 and a cross piece 85 of the bed 79, with a spring 86 interposed between said cross piece and said lug. A nut 87 is placed on the right-hand end of the rod 84, and the spring 86 forces the lug 82 against said nut, and exerts a constant pressure to the right on said lug and the carriage 81. Slidingly arranged in the longitudinal center of the carriage 81 is a rod 88, which rod projects beyond the right-hand end of said carriage, and is forced rearwardly by means of a spring 89 interposed in said carriage between the inner end of said rod and a plug 90 in the left-hand end of the passage provided in said carriage for said rod, spring, and plug. A pin 91 extends downwardly from the carriage 83 into a vertical opening 92 in the carriage 81, and is rigidly attached to the rod 88. The opening 92 is large enough to permit the pin 91 to move back and forth therein, and the spring 89 tends constantly to force the rod 81 to the right.

The top of the carriage 81 at the left-hand end is elevated, and secured to this elevated portion are ten holding rods 93. These rods are arranged side by side and extend to the left over the top of the carriage 83, and through a block 96 secured to said carriage, and through a knife 95 carried by said block at the left-hand end to cooperate with the knife 80. A bed block 96 secured to the top of the bed 79, at the left of the block 94, has a gage-bar 97 which receives the strips 51 as they descend and positions them for cutting. In the block 96, beneath the knife 80, are ten channels 98 to receive the points as they are cut from the strips, and wherein said points are held intermittently by the rods 93.

Mounted on and bolted to the block 94 and extending to the left over a portion of the knife 95 is a guide bar 99, and having its ends rigidly secured to said bar is a U-shaped guide bar 100. Slidingly arranged in the bars 99 and 100 are ten clamping plungers 101, each provided intermediate of its ends with a collar 102. The passages in the bar 99 for the plungers 101 are enlarged at their front terminals to accommodate the collars 102. Encircling the plungers, and between the transverse part of the bar 100 and the collars 102, are springs 103. These springs have a constant tendency to force the collars 102 and plungers 101 to the left. The rods 93 are directly in line with the channels 98, and the plungers 101 are in position to contact with the right-hand side of the knife 80, or with interposed strips 51, when said plungers are advanced. A transverse rock-shaft 104 is journaled in the bed 79 below and a little to the left of the shaft 5, and mounted on and secured to said rock-shaft are short and long arms 105 and 106, respectively. These arms extend upwardly, and the long arm is behind the short arm. The arm 105 bears at its upper terminal against the outer end of the rod 88, and the arm 106 bears at the upper end against a roll 107 mounted on a transverse shaft 108 journaled in two bearings 109 that rise from the carriage 81. Mounted on and secured to the shaft 5 between the bearings 4 are two cams 110 and 111, the former being larger than the latter. The cam 110 is in contact with the roll 107, and the cam 111 with the arm 106.

At each revolution of the shaft 5, the cam 110, acting on the roll 107 and through the medium of the shaft 108 and the bearings 109, forces the carriage 81 to the left, or advances it, against the resiliency of the spring 86, and permits said carriage to be retracted by said spring and returned to initial position, and at the same time the cam 111 acting on the arm 106 rocks said arm to the left on the rock-shaft 104 and with it the arm 105, and said last-named arm forces the rod 88 to the left, against the resiliency of the spring 86, with the result that the carriage 83 is moved in the same direction or advanced, through the medium of the pin 91, and then said last-named spring acts to move said last-named carriage to the right into initial or retracted position.

While the holding rods 93 are in contact with the last points cut from the strips 51, these points and those that more immediately preceded them, if any, are located in the channels 113 back of said rods and of the vertical plane of the left-hand sides of said strips above.

The advance movement of the carriages 81 and 83, which takes place as soon as the strips 51 come to rest at their bottom ends on the gage-block 97, causes the plungers 101 to contact forcibly with said strips, the carriage 83 being advanced far enough to carry the block 99 farther away from the left-hand ends of the collars 102 on said plungers, and thus compress the springs 103 on the plungers to a greater extent, with the result that said strips are held by the left-hand ends of the plungers firmly against the right-hand side of the knife 80. At the same time the knife 95 is advanced against the lower terminal portions of the strips 51, and, while the plungers 101 are still in clamping position relative to said strips, said knife makes a shearing cut with the adjacent edge of the knife 80, and produces a set of ten points. By this time the advancing carriage 83 carries to the left the rods 93 which stop finally with their forward ends against the points last cut, in which position said rods remain while the knife

95 is retracted and with it the plungers 101.

In these operations the plungers 101, with the knife 95, are advanced and retracted by and with the carriage 81, said plungers, however, being additionally subject to the action of their springs 103 and therefore having independent movements of their own, while the rods 93 are advanced and retracted by and with the carriage 83.

A carrier 112 having therein channels 113, is attached at one end to the left-hand end of the bed 79, and receives the points, represented at 114 in Fig. 2, as they are forced along out of the channels 98.

The functioning and operation of the strip-feeding mechanism as a whole is described as follows:

First, it is necessary to start or introduce the ten strips 51 into the feeding elements of the mechanism. In doing this the strips from the spool 49 are carried up through the slots in the guide 56 behind the bar 58 and between the guide bars 57, beneath the rods 59 onto the wheel 38, the lever 73 having been manipulated to raise the roll 61 from said wheel and maintain said roll in elevated position; then said strips are carried over said wheel, inserted in the holder 62 and pushed along into the tubes 60, and through the curved portions 60′ and down through the bottom ends thereof, until they come to rest on the gage-block 97, on the way passing between or in connection with any auxiliary guide or feeding members, such as the plates 77 and 78, that may be employed in connection with the present feeding mechanism. The feeding mechanism is now ready for effective operation.

The switch 23 is thrown to set the motor 19 in motion, and, if necessary, the rod 46 is forced rearwardly to elevate the friction cone 33 into engagement with the friction cone 39. The driving and driven parts are now in motion.

At every revolution of the cams 110 and 111 the knife 95, clamping plungers 101, and holding rods 93 are operated to cut ten points from the bottoms of the strips 51, and all of the points previously cut are moved in their channels a distance equal to the thickness of one point.

The strips 51 are fed constantly, although having their lower ends momentarily retarded by the clamping plungers 101 while the cut is being made each time. The constant feeding operation is made possible by the bows 60′ wherein the slack in the strips, produced while they are being held by the plungers, can accumulate, so to speak, and this slack in the strips when of spring steel, automatically assists in the feeding operation, as soon as the strips are released by said plungers.

We claim:

1. In strip-feeding mechanism, feeding mechanism for a strip, and a tubular member adapted to guide said strip, which member has the form of a compound curve to interrupt and divert said strip in its movement through said guide member, and enable the resiliency of the strip to be utilized in feeding.

2. In strip-feeding mechanism, a feed wheel, and means to guide a plurality of strips onto said wheel, said means comprising a cross piece provided with a bar, side pieces extending from said cross piece partly over said wheel, and a connecting member between said side pieces at their upper terminals, and supporting means for said guiding means.

3. In strip-feeding mechanism, a feed wheel, and means to guide a plurality of strips onto said wheel, said means comprising a cross piece grooved to form a guide for a plurality of strips, and provided with a bar to retain said strips in said grooves, side pieces extending from said cross piece partly over said wheel, and a connecting member between said side pieces at their upper terminals, and supporting means for said guiding means.

4. In strip-feeding mechanism, an upright, a bracket supported by said upright, a cross piece attached to said bracket and provided with a cross bar to serve as guiding means for a plurality of strips, a feed wheel, side bars secured to said cross piece and extending upwardly over a portion of said wheel, connecting means extending between the upper terminals of said side pieces across said wheel, and means to guide said strips from said wheel.

5. In strip-feeding mechanism, a feeding wheel, means to drive said wheel, a pivotally mounted weighted lever provided with a friction roll arranged to bear on strips passing over said wheel, means to guide a plurality of strips to the bite between said wheel and said roll, and means to guide said strips after they leave said bite.

6. In strip-feeding mechanism, a feeding wheel, means to drive said wheel, a pivotally mounted weighted lever provided with a friction roll arranged to bear on strips passing over said wheel, means to guide a plurality of strips to the bite between said wheel and said roll, means to guide said strips after they leave said bite, and means to elevate said wheel and maintain the former in raised position.

7. In strip-feeding mechanism, a wheel, means to drive said wheel, a pivotally mounted weighted lever provided with a roll arranged to bear on said wheel, a pivotally mounted lifting lever having a part adapted to swing said first-named lever upwardly and carry said roll away from said wheel, a

latch for said lever, and a fixed member with which said latch is adapted to engage.

8. In strip-feeding mechanism, a wheel, means to drive said wheel, a pivotally mounted lever provided with movable bearing blocks, adjusting means for said blocks, a shaft carried by said blocks, a roll on said shaft in position to bear on said wheel, means to guide a plurality of strips to the bite between said wheel and said roll, and means to guide said strips from said bite.

9. In strip-feeding mechanism, a guide tube, for a strip, in the form of a compound curve to provide an indirect path for said strip, and enable the resiliency of the strip to be utilized for feeding purposes.

10. In strip-feeding mechanism, a wheel and a roll coacting for feeding purposes, a plurality of tubes, and supporting means for said tubes, said supporting means consisting in part of a holder which opens adjacent to the bite between said wheel and roll, and has the upper terminals of said tubes connected therewith.

11. In strip-feeding mechanism, a wheel and a roll coacting for feeding purposes, a holder opening adjacent to the bite between said wheel and roll, and a plurality of tubes opening at their upper ends into said holder, extending away from said holder and being bowed and then extending in a generally downward direction, said wheel and roll being adapted to feed a plurality of strips into and through said holder into said tubes, at the bottom ends of which latter said strips emerge.

12. In strip-feeding mechanism, a support, a carrier movable on said support, a cam arranged to move said carrier, means for actuating said cam, a driving shaft journaled in said carrier, driving members on said shaft, a strip-feeding wheel, driving mechanism between one of said driving members and said wheel, a second shaft, and a driven member on said second shaft, the other of said driving members being adapted to engage said driven member when said carrier is located in one position by said cam, and to disengage said driven member when said carrier is located in another position by said cam.

13. In strip feeding mechanism, a spool divided by partitions into a plurality of separate grooves for receiving strips from separate rolls, means for guiding strips to said grooves, guiding means to receive strips from said grooves and a tension roll between said guiding and receiving means for bearing on said strips to hold them in the grooves of said spool.

14. In strip-feeding mechanism, continuously operating mechanism for feeding a strip, stop mechanism including a member for engaging one side of a strip at its leading end and for pressing said end against an immovable member and a non-straight guide tube relatively larger than a strip extending between said stop and feed mechanism for loosely confining a strip so that it may buckle to abut the sides of the tube and provide slack therein under tension for feeding said strip forwardly when released.

15. In strip-feeding mechanism, continuously operating mechanism for feeding a strip, stop mechanism including a member for engaging one side of a strip at its leading end and for pressing said end against an immovable member and a curved guide tube relatively larger than a strip extending between said stop and feed mechanism for loosely confining a strip so that it may buckle to abut the sides of the tube and provide slack therein under tension for feeding said strip forwardly when released.

CHARLES J. FANCHER.
ROBERT A. JOHNSON.