No. 894,617. PATENTED JULY 28, 1908.

J. J. FEARON.

MACHINE FOR CUTTING STRIPS OF PACKING.

APPLICATION FILED JAN. 2, 1908.

4 SHEETS—SHEET 1.

Fig. 1

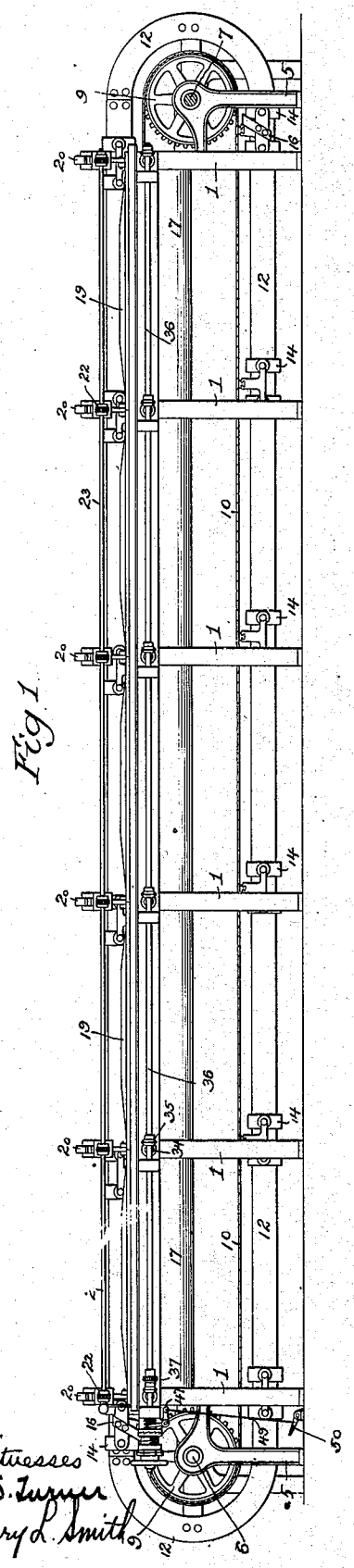
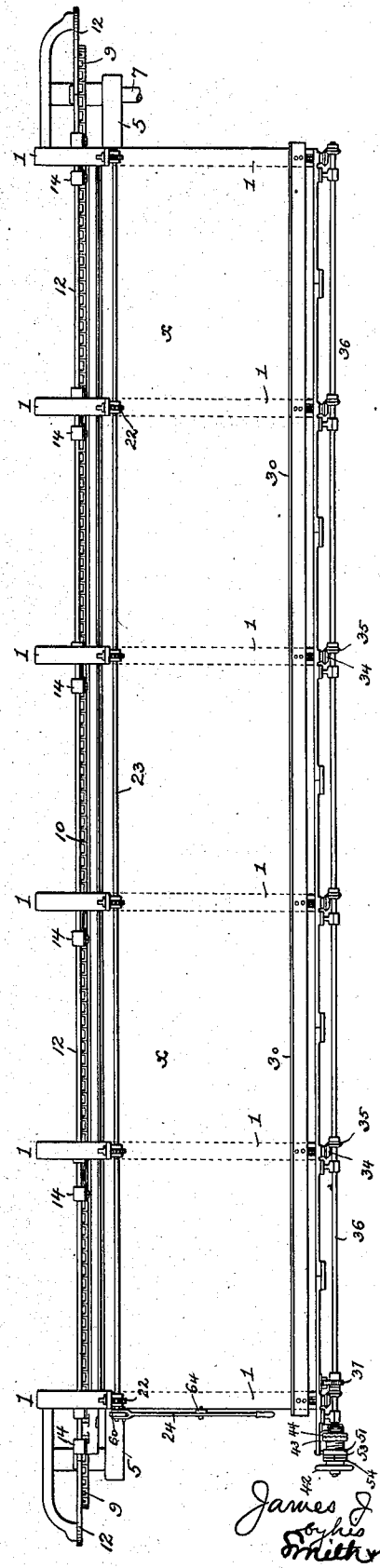


Fig. 2



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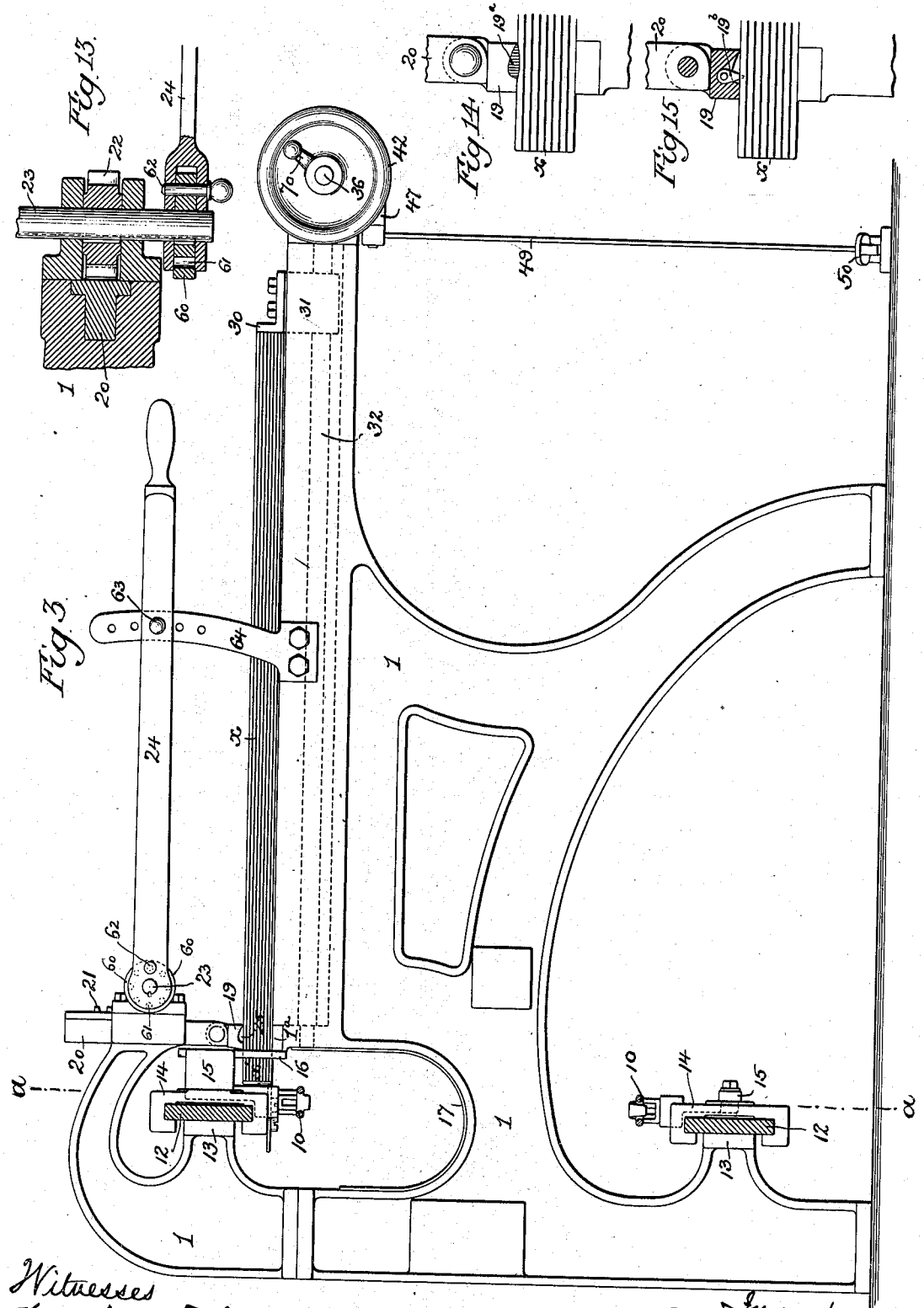
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4 SHEETS—SHEET 2.



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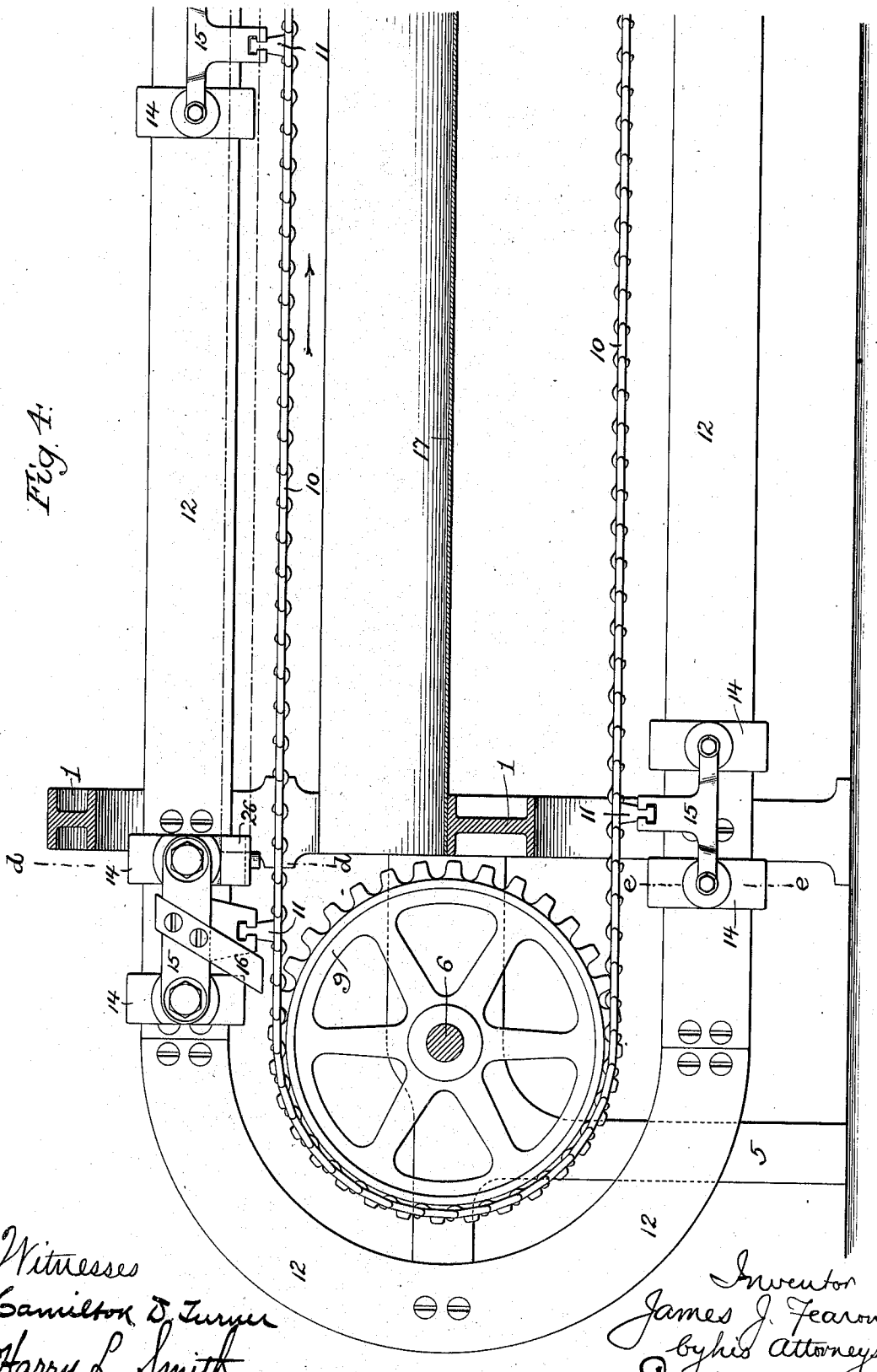
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4 SHEETS—SHEET 3.

Fig. 4.



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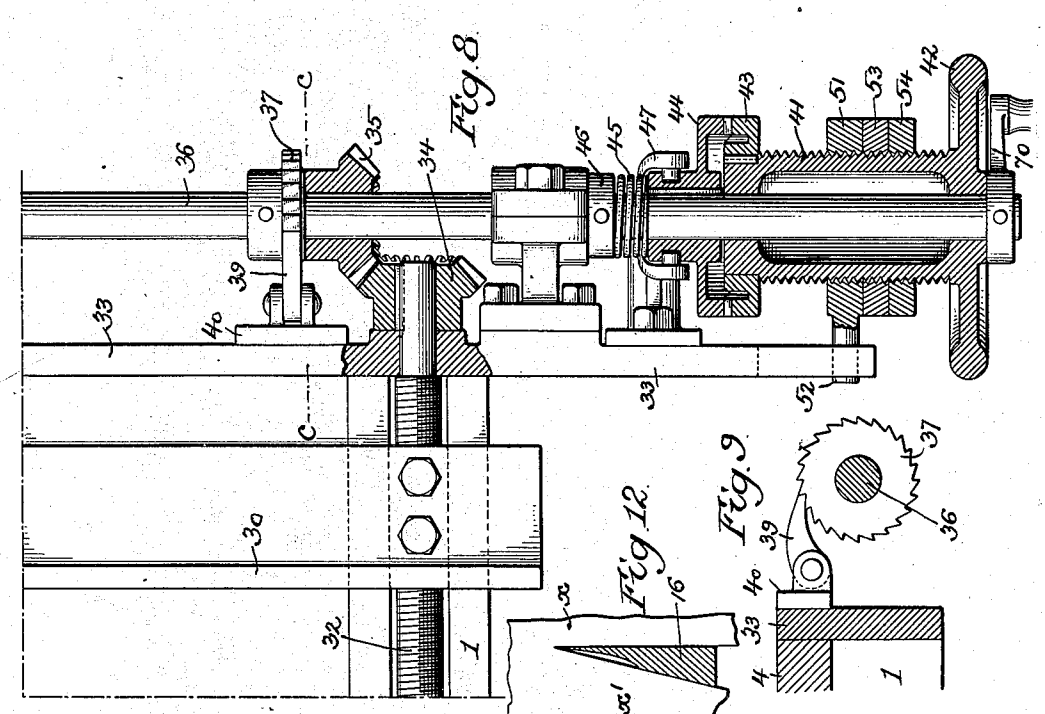
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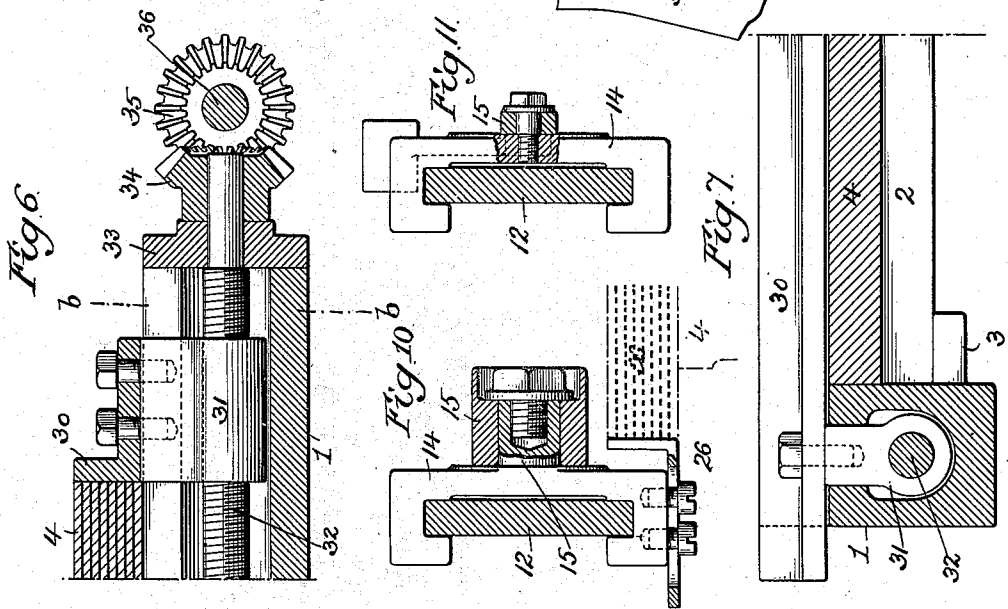
J. J. FEARON.

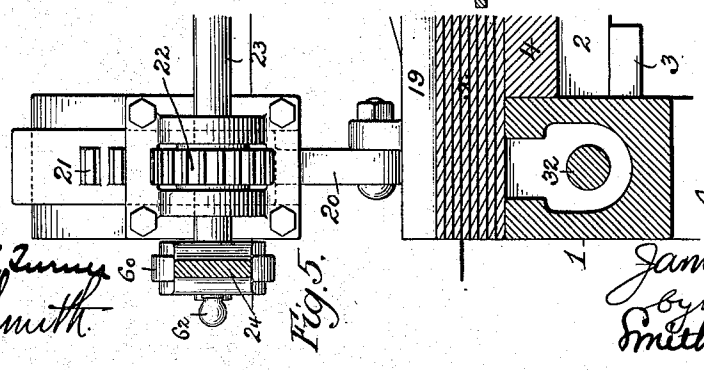
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4 SHEETS—SHEET 4.







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UNITED STATES PATENT OFFICE.

JAMES J. FEARON, OF PHILADELPHIA, PENNSYLVANIA, ASSIGNOR OF ONE-FOURTH TO JAMES CONLEY, OF PHILADELPHIA, PENNSYLVANIA.

MACHINE FOR CUTTING STRIPS OF PACKING.

No. 894,617. Specification of Letters Patent. Patented July 28, 1908.

Application filed January 2, 1908. Serial No. 408,929.

To all whom it may concern:

Be it known that I, JAMES J. FEARON, a citizen of the United States, residing in Philadelphia, Pennsylvania, have invented certain Improvements in Machines for Cutting Strips of Packing, of which the following is a specification.

The object of my invention is to provide an effective machine for the rapid cutting of strips, tapes, or ribbons, (hereinafter, for convenience, termed "strips") from the slabs, sheets, or blankets, (hereinafter, for convenience, termed "slabs") of the material from which hydraulic and other packings are usually made, this material ordinarily consisting of a plurality of plies of textile material, with interposed layers of rubber and being extremely hard to cut.

The aim of my invention has been to effect the cutting operation very rapidly and without arduous or skilled labor, and to insure accuracy of cut and uniformity in the cut strips.

In the accompanying drawings, Figure 1 is a side elevation of a packing strip cutting machine made in accordance with my invention; Fig. 2 is a plan or top view of the same; Fig. 3 is a view partly in end elevation and partly in transverse section; Fig. 4 is a view, partly in side elevation and partly in longitudinal section, on the line *a*—*a*, Fig. 3; Fig. 5 is a view, partly in side elevation and partly in longitudinal section, showing part of a presser bar constituting one of the elements of the machine, and part of the mechanism for effecting the raising and lowering of said bar; Fig. 6 is a view, partly in elevation and partly in transverse section, illustrating a feed bar constituting one of the elements of the machine and part of the mechanism for operating said feed bar; Fig. 7 is a view, partly in side elevation and partly in longitudinal section, on the line *b*—*b*, Fig. 6; Fig. 8 is a view, partly in top or plan view and partly in horizontal section, illustrating other mechanism employed in connection with the feed bar; Fig. 9 is a view, partly in elevation and partly in section, on the line *c*—*c*, Fig. 8; Fig. 10 is a view, partly in elevation and partly in transverse section, on the line *d*—*d*, Fig. 4; Fig. 11 is a view, partly in elevation and partly in transverse section, on the line *e*—*e*, Fig. 4; Fig. 12 is a horizontal section of the cutting knife; Fig. 13 is a view, partly in plan and partly in horizontal section, illustrating a detail of the mechanism for adjusting the presser bar, and Figs. 14 and 15 are sectional views showing special constructions of said bar. Figs. 3 and 4 are on a larger scale than Figs. 1 and 2, and Figs. 5 to 15, inclusive, are on a still larger scale than Figs. 3 and 4.

The fixed structure of the machine comprises a number of transverse frames 1, similar to one another, as many of these transverse frames being employed as the desired length of the machine may require, and the frames being, by preference, longitudinally steadied or braced by means of beams or girders 2 suitably secured to projecting lugs 3 on the frames 1, and carrying table sections 4, which are interposed between the frames 1, as shown in Fig. 7, and serve to support the slab of material from which the strips are to be cut.

A bearing bar 1^a extends from one end of the machine to the other, and is supported by the frames 1, this bar providing a rigid support for that portion of the slab from which the strip is being cut.

Secured to the floor and to the end frames 1 are supplementary frames 5 which furnish bearings for two shafts 6 and 7, of which one, in this case the shaft 7, constitutes the driving shaft and is rotated by power applied thereto in any available way. Each of these shafts has a sprocket wheel 9 and to these sprocket wheels is fitted an endless chain belt or carrier 10, certain of the links of this chain having T-headed lugs 11, which enter corresponding T-shaped slots in slides mounted upon a continuous guide rail 12, secured to projecting bearings 13 on the frames 1, said guide rail comprising upper and lower longitudinal members and semi-circular connecting members at each end of the machine.

Each of the slides consists of a pair of yokes 14 engaging the guide rail 12 and connected by a cross bar 15 in which is formed the T-shaped slot for the reception of the lug 11 on the chain belt 10. Most of the slides serve simply as a means for guiding and supporting the upper and lower runs of the belt, but certain of the slides also constitute carriers for cutting knives 16, the machine shown in the drawing having two of these

cutting knives, so disposed that when one is being carried from the left hand end of the machine to the right hand end of the same by the upper run of the belt, and is cutting the strip from the slab of material lying upon the table, the other knife is being carried by the lower run of the belt from the right hand end of the machine to the left hand end, so that the only lapse of time between the successive cutting actions is that occupied by the returning knife in passing around the sprocket wheel at the left hand end of the machine, during which time readjustment of the slab of material on the table can be effected in order to bring a new portion of the same into position for being severed.

The slab of material from which the strips are to be cut is represented at x in Fig. 3, and after being laid upon the table is fed forward thereon until its front edge projects beyond the bearing bar 1^a to the extent of the desired width of the strip to be cut therefrom, the knife then traversing along the front edge of the table and severing the strip x' from the slab, the strip, after being severed, dropping into a trough 17.

The cutting knife 16 is inclined rearwardly from top to bottom and is of wedge shape in cross section, as shown in Fig. 12, the lower portion of the knife extending some distance below the top of the table, as shown in Fig. 3, whereby the strip is completely severed from the slab by a clean shear cut.

The knife is, by preference, hollow-ground, as shown in Fig. 12, in order to relieve that portion of it which is adjacent to the cutting edge, from frictional contact with the cut strip, thus preventing such heating of the cutting portion of the knife as would destroy its temper or otherwise interfere with its efficient action.

The material is held firmly upon the table, right up to the line of cut, by means of a presser bar 19, which extends from end to end of the table and is made in sections disposed end to end, as shown in Fig. 1, and hung to a series of slides 20, one for each of the frames 1, each slide being properly guided in a bearing on said frame and being provided with a rack 21, which meshes with a pinion 22 on a shaft 23 also extending from end to end of the machine and mounted in suitable bearings on the frames 1, a lever 24, at one end of said shaft, serving as a means of operating the slides 20 so as to raise or lower the presser bar each section being free to swing on its carrying slides independently of the others to accommodate itself to irregularities in the surface of the material

The lever 24 is forked at that end which is hung upon the shaft 23 (see Fig. 13) and embraces a disk 60 on the shaft, said disk having a series of openings 61 to any one of which, and to openings in the forked end of the lever, can be adapted a pin 62, whereby the position of the lever in respect to the shaft 23 can be changed to accord with the varying thicknesses of the material which is being cut, it being advisable to engage the lever with a pin 63, on a retaining bar 64 on the end frame when said lever has been adjusted so as to press the bar 19 down upon the surface of the slab.

The underside of the presser bar 19 is preferably recessed, as shown at 25 in Fig. 3, the recess terminating at the rear edge of the bar in a relatively sharp projection which indents the upper surface of the sheet and thereby increases the grip of the presser bar on said sheet and prevents any displacement of the same under the action of the knife. If desired, however, this recess may be filled with rubber or other elastic material 19^a (Fig. 14) in order to provide a yielding bearing face on the bar and compensate for inequalities in the thickness of the slab or any departure of the bearing face on the bar 19 from a straight line, thereby insuring a firm grip upon the slab throughout the entire length of the bar; or the bar may have hung upon it, at intervals, fingers 19^b (Fig. 15) whose lower ends project slightly below the lower face of the bar and thus serve to bite into the slab and prevent any tendency of the knife to draw it forwardly on the table, especially when only a narrow width of the slab remains uncut.

To prevent buckling of the projecting portion of the slab in advance of the knife I provide the knife-carrying slide with a bearing for the edge of said projecting portion of the slab. This guide consists, in the present instance, of an angle bar 26 whose vertical flange constitutes the bearing for the slab and whose horizontal flange is slotted for the reception of bolts whereby it is secured to the underside of the forward yoke 14 of the knife carriage, as shown in Fig. 10, the bearing being thereby adjustable to suit different widths of cut strip.

The feeding forward of the slab of material x over the table of the machine in the intervals between the successive cutting operations is effected by mechanism best shown in Figs. 6, 7, 8, and 9. A feed bar 30, bearing upon the rear edge of the slab extends from end to end of the machine and is supported slightly above the level of the horizontal members of the frames 1, by means of nuts 31 traveling in grooves in said horizontal members of the frames, each nut being engaged by a screw shaft 32, reduced in diameter at the ends and having these reduced portions adapted to bearings at the front portions of said horizontal members of the frames 1 and in a bar 33 carried by the rear ends of said members, whereby the screw shafts 32 are retained against longitudinal movement. Each of said screw shafts 32 has, at its rear end, a bevel wheel 34, and

each of these bevel wheels meshes with a bevel pinion 35 on a shaft 36 which extends from end to end of the machine and is free to turn in suitable bearings mounted on the bar 33, the hub of one of these pinions 35 being provided with a ratchet wheel 37, which is engaged by a pivoted pawl or detent 39 hung to a bracket 40 on the bar 33, as shown in Figs. 8 and 9, in order that the shaft 36 and the pinions carried thereby may be permitted to move in but one direction.

Mounted so as to be free to rotate on the shaft 36 is an externally threaded hub 41, provided with a hand wheel 42, whereby it can be readily turned in either direction, the inner end of this hub having secured to it a clutch member 43 which is normally in engagement with a corresponding clutch member 44 splined upon the shaft 36, and held in engaging position by means of a coiled spring 45 interposed between its hub and a collar 46 on the shaft, as shown in Fig. 8.

The hub of the clutch member 44 is grooved for engagement with pins on a forked lever 47 (Fig. 1) and this lever has a connection 49 with a treadle 50 mounted upon the floor at one end of the machine, pressure upon said treadle serving to move the clutch member 44 out of engagement with the clutch member 43 against the action of the spring 45.

Mounted upon the threaded hub 41, and free to slide thereon, is a nut 51, which is prevented from turning on the hub by engagement of a finger 52 on the nut with a slot in the projecting end of the bar 33, as shown in Fig. 8, and also mounted upon the threaded hub 41 are a pair of jam nuts 53 and 54, which can be adjusted on the hub in order to determine the extent of travel of the nut 51 thereon, said nut, at the outer end of its travel, striking the innermost jam nut 53 and at the inner end of its travel, striking the clutch member 43.

Supposing that the nut 51 is originally at the outer end of its travel and in contact with the inner end of the jam nut 53, as shown in Fig. 8, turning of the hand wheel 42 to the right will cause said nut 51 to travel on the hub 41 until it comes into contact with the clutch member 43, and the clutch members 43 and 44 being in engagement with one another, this rotative movement of the hub 41 will be transmitted to the shaft 36 and thence through the bevel pinions 35 and bevel wheels 34 to the screw shafts 32, so as to cause forward movement of the feed bar 30 and corresponding movement of the slab x, thereby causing the forward edge of the latter to be projected beyond the forward edge of the table and into the path of the knife 16 which is carried from one end of the machine to the other by engagement of its slide with the upper run of the chain belt 10.

When, or before, the projecting strip has been severed by the cutting knife from the slab x, the attendant, by pressure of the foot upon the treadle 50, releases the clutch members 43 and 44 from engagement with one another, and the threaded hub 41 can now be turned to the left in order to retract the traveling nut 51 until the same is again in contact with the inner jam nut 53, the clutch members being then reëngaged and a further forward feeding movement of the slab x effected, at the proper time, to the extent permitted by the length of travel of the nut 51.

The use of the treadle in connection with the clutch member 44 is only to effect separation of the same from the member 43 when the latter is being turned backward, for as the member 44 is carried by the shaft 36, which cannot turn backward, there would be considerable wear upon the teeth of the clutch members unless they were thus separated during the backward movement of the member 43.

During each forward feed of the slab x the presser bar 19 is lifted free from contact with said slab by manipulation of the lever 24, but after each forward feed of the slab has been completed, and before the knife 16 begins to sever the projecting portion from said slab, upward pressure upon the lever 24 forces the presser bar 19 into contact with the upper face of the slab and firmly clamps the forward portion of the same to the table during the cutting operation.

By proper adjustment of the jam nuts 53 and 54 the width of the projected portion of the slab x, upon each successive feed of the same, can be very accurately regulated and any desired number of successive forward feeds of the slab to precisely the same extent can be effected, thereby insuring uniformity in the width of the strips cut from said slab.

After the cutting of the slab into strips has been completed, the ratchet wheel 37 is freed from the restraint of the pawl 39, and the shaft 36 is then turned backward as by means of a handle 70 (Fig. 3) until the feed bar 30 has been retracted to its starting position.

As each strip is completely severed from the slab on each travel of the cutting knife from one end of the machine to the other and as only sufficient time is provided between the successive cutting actions to permit of the readjustment of the slab on the table, it will be evident that the machine is extremely rapid in its operation.

Owing to the wedge-shaped cross section of the cutting knife and to the disposition of its cutting edge at an angle in respect to the vertical, the strip, as fast as it is cut from the sheet, is thrown downwardly and outwardly into the trough 17, the rigidity with which the knife-carrying slide is held in position by the upper run of the guide bar 12 preventing any deflection of the knife from its true line of travel and insuring a clean, straight cut.

Where the material to be cut into strips is composed of thin sheets a number of these may be superposed and the entire mass fed forward over the table as a unit, and any desired form of operating mechanism for the knife may be adopted within the scope of my invention, that shown being preferred because of its simplicity, its certainty of action, and its time-saving quality, due to the fact that one knife is being returned from the finishing to the starting end of the machine while the other knife is effecting its cut.

I claim:—

1. In a packing strip cutting machine, the combination of a table for supporting a slab of the packing material with an endless chain having continuous forward movement, and a plurality of knife carrying slides engaged by said chain and spaced apart in the direction of the length of the same, said knives being so disposed in respect to a projecting portion of the slab as to form a cut between said projecting portion and the body of the slab, and the successive knives acting in succession to form such cuts.

2. In a packing strip cutting machine, the combination of a table for supporting a slab of packing material, a cutting knife extending below the upper face of said table, and draft mechanism upon which said cutting knife is rigidly mounted, whereby it will completely sever a strip from the projecting forward edge of the sheet during a single travel of the knife from one end of the machine to the other.

3. A packing strip cutting machine in which are combined a table for supporting a slab of packing material, a knife-carrying slide, a guide bar therefor, and means for imparting continuous forward movement to said slide.

4. A packing strip cutting machine in which are combined a table for supporting a slab of packing material, a knife-carrying slide having, in advance of the knife, an edge bearing for said slab, a guide bar for said slide and means for imparting draft to the slide.

5. A packing strip cutting machine in which are combined a table for supporting a slab of packing material, a knife-carrying slide, a guide bar therefor, an endless chain to which said knife-carrying slide is attached, and means for imparting continuous forward motion to said endless chain.

6. A packing strip cutting machine in which are combined a table for supporting a slab of packing material, a knife-carrying slide, a guide bar therefor comprising upper and lower runs and semi-circular end connections, an endless chain to which said knife-carrying slide is attached, and means for imparting motion to said endless chain.

7. A packing strip cutting machine in which are combined a table for supporting a slab of packing material, a cutting knife, means for imparting draft thereto, and a presser bar bearing upon the surface of the slab at a point close to the line of cut and composed of a series of independently swinging sections disposed end to end.

8. A packing strip cutting machine in which are combined a table for supporting a slab of packing material, a cutting knife, means for imparting draft thereto, a presser bar bearing upon the surface of the slab at a point close to the line of cut, and composed of a series of independently swinging sections disposed end to end and means for raising and lowering said presser bar.

9. A packing strip cutting machine in which are combined a table for supporting a slab of packing material, a cutting knife, means for imparting draft thereto, a presser bar bearing upon the surface of the slab at a point close to the line of cut, racks disposed at intervals throughout the length of said presser bar, a shaft having pinions engaging said racks, and means for imparting a partial turn to said shaft.

10. A packing strip cutting machine in which are combined a table for supporting a slab of packing material, a cutting knife, means for operating the same, a presser bar bearing upon the surface of the slab at a point close to the line of cut, racks disposed at intervals throughout the length of said presser bar, a shaft having pinions engaging said racks, and means for imparting a partial turn to said shaft, said means including a lever adjustable to different angular positions in respect to the shaft.

11. A packing strip cutting machine in which are combined a table for supporting a slab of packing material, a cutting knife, means for operating the same, and a presser bar bearing upon the surface of the slab at a point close to the line of cut, said presser bar having a central groove or recess in its under face.

12. A packing strip cutting machine, in which are combined a table for supporting a slab of packing material, an endless chain having continuous forward movement, a plurality of knife-carrying slides engaged by said chain, and separated from each other in the direction of the length of the same, whereby they form successive cuts in the slab, and means for feeding the slab forwardly between the successive cuts.

13. A packing strip cutting machine in which are combined a table for supporting a slab of packing material, a cutting knife, means for operating the same, and a presser bar bearing upon the surface of the slab at a point close to the line of cut, said presser bar having a grooved under face presenting a relatively sharp portion for indenting the upper face of the slab.

14. A packing strip cutting machine in

which are combined a table for supporting a slab of packing material, a knife-carrying slide, a guide bar therefor, and an endless chain having a T-shaped lug thereon engaging with a corresponding slot in a member of the knife-carrying slide.

15. A packing strip cutting machine in which are combined a table for supporting a slab of packing material, a knife-carrying slide, a guide bar therefor, an endless chain having means for engaging said knife-carrying slide, and a series of supplementary slides also engaging said chain and guide bar and serving as supports for the upper and lower runs of the chain.

16. A packing strip cutting machine in which are combined a table for supporting a slab of packing material, an endless chain, a plurality of knife-carrying slides engaging said chains, a guide for said knife-carrying slides, and a series of supplementary slides interposed between the knife-carrying slides and also engaging said chain and guide.

17. A packing strip cutting machine in which are combined a table for supporting the slab of packing material, a strip cutting knife, operating mechanism therefor, means for feeding the slab forwardly by a succession of movements and a resettable stop for limiting the extent of each movement.

18. A packing strip cutting machine in which are combined a table for supporting a slab of packing material, a strip cutting knife, operating mechanism therefor, a feed bar acting upon the rear edge of the slab to feed the same over the table, devices for imparting forward movements to said feed bar and means for preventing back movement of the same.

19. A packing strip cutting machine in which are combined a table for supporting a slab of packing material, a strip cutting knife, operating mechanism therefor, a feed bar acting upon the rear edge of the slab to feed the same over the table, a plurality of feed screws engaging nuts on said feed bar, a shaft geared to said feed screws, and means for preventing back movement of said shaft.

20. A packing strip cutting machine in which are combined a table for supporting the slab of packing material, a cutting knife, means for operating the same, a feed bar acting upon the rear edge of the slab to feed the same over the table, a plurality of feed screws engaging nuts on said bar, an operating shaft geared to said feed screws and means for turning said shaft, said means including a clutch whereby the shaft can be connected to or disconnected from said turning means.

21. A packing strip cutting machine in which are combined a table for the support of the slab of packing material, a cutting knife, operating mechanism for the latter, a feed bar for moving a sheet of packing material over the table, actuating devices for imparting a succession of movements to said feed bar, and stop mechanism for limiting the extent of each movement of said actuating devices.

22. A packing strip cutting machine in which are combined a table for the support of the slab of packing material, a cutting knife, operating mechanism for the latter, a feed bar for moving a sheet of packing material over the table, actuating devices for imparting a succession of movements to said feed bar, a traveling stop for limiting the successive forward movements of the bar, and means for resetting said stop after each forward movement of the same, without retracting the feed bar.

23. A packing strip cutting machine in which are combined a table for the support of the slab of packing material, a cutting knife, means for operating the latter, a feed bar acting to move the slab over the table by a succession of movements, a shaft whereby said actuating devices are simultaneously operated, means for rotating said shaft including a clutch whereby the shaft can be connected to or disconnected from said rotating means, and stop mechanism actuated by said rotating means.

24. A packing strip cutting machine in which are combined a table for the support of a slab of packing material, a cutting knife, operating mechanism for the latter, a feed bar for moving the sheet of packing material over the table, a plurality of actuating devices for said feed bar, a shaft for simultaneously operating said actuating devices, a threaded hub on said shaft, a traveling nut on said hub, and stops for limiting the extent of such travel.

25. A packing strip cutting machine in which are combined a table for the support of a slab of packing material, a cutting knife, operating mechanism for the latter, a feed bar for moving the sheet of packing material over the table, a plurality of actuating devices for said feed bar, a shaft for simultaneously operating said actuating devices, a threaded hub on said shaft, a traveling nut on said hub, and stops for limiting the extent of such travel, one of said stops being adjustable.

26. A packing strip cutting machine in which are combined a table for the support of the slab of packing material, a cutting knife, means for operating the same, a feed bar supported free from contact with the table for moving the slab of packing material over the latter, and means for actuating said feed bar.

27. A packing strip cutting machine in which are combined a table for the support of a slab of packing material, a cutting knife, operating mechanism therefor, a feed bar for moving the slab of packing material over the

table, operating mechanism for said feed bar, including a shaft, means for rotating said shaft including a clutch, and clutch-operating mechanism including a treadle.

28. A packing strip cutting machine having, in combination, a table for the support of the slab of packing material, a cutting knife, operating mechanism therefor, a feed bar whereby the slab of packing material is moved over the table, operating mechanism for said feed bar including a shaft with a sliding clutch member thereon, and rotating mechanism for said shaft including a threaded hub having thereon a clutch member, a traveling nut, and an adjustable stop nut.

29. A packing strip cutting machine having, in combination, a table for the support a slab of packing material, a cutting knife, operating mechanism therefor, a feed bar whereby the slab of packing material is moved over the table, operating mechanism for said feed bar, including a shaft with a sliding clutch member thereon, and rotating mechanism for said shaft including a threaded hub having thereon a clutch member, a traveling nut, and an adjustable stop nut, said traveling nut being free to play between the stop nut and the clutch member.

30. A packing strip cutting machine comprising a series of frames having interposed longitudinal connections and table sections, a cutting knife, operating mechanism therefor, and means for feeding the slab of packing material over the table.

31. A packing strip cutting machine having, in combination, a series of frames, each with grooved horizontal member, longitudinal connections, and table sections interposed between said frames, a cutting knife, operating mechanism therefor, a feed bar for moving the slab of packing material over the table, nuts connected to said feed bar and free to move in the grooved horizontal members of the frames, screw shafts engaging said nuts, and means for simultaneously operating said screw shafts.

32. A packing strip cutting machine in which are combined a table for the support of a slab of packing material, means for adjusting said slab on the table so that its forward edge will project beyond the edge of the table, a cutting knife of wedge-shaped cross section likewise beyond the edge of the table, and having its cutting edge inclined in respect to the vertical, and draft mechanism for said cutting knife.

In testimony whereof, I have signed my name to this specification, in the presence of two subscribing witnesses.

JAS. J. FEARON.

Witnesses:
HAMILTON D. TURNER,
KATE A. BEADLE.