No. 667,533. Patented Feb. 5, 1901.

# C. KELLER.

## GLUE CUTTING MACHINE.

(Application filed May 9, 1900.)

(No Model.) 4 Sheets—Sheet 1.

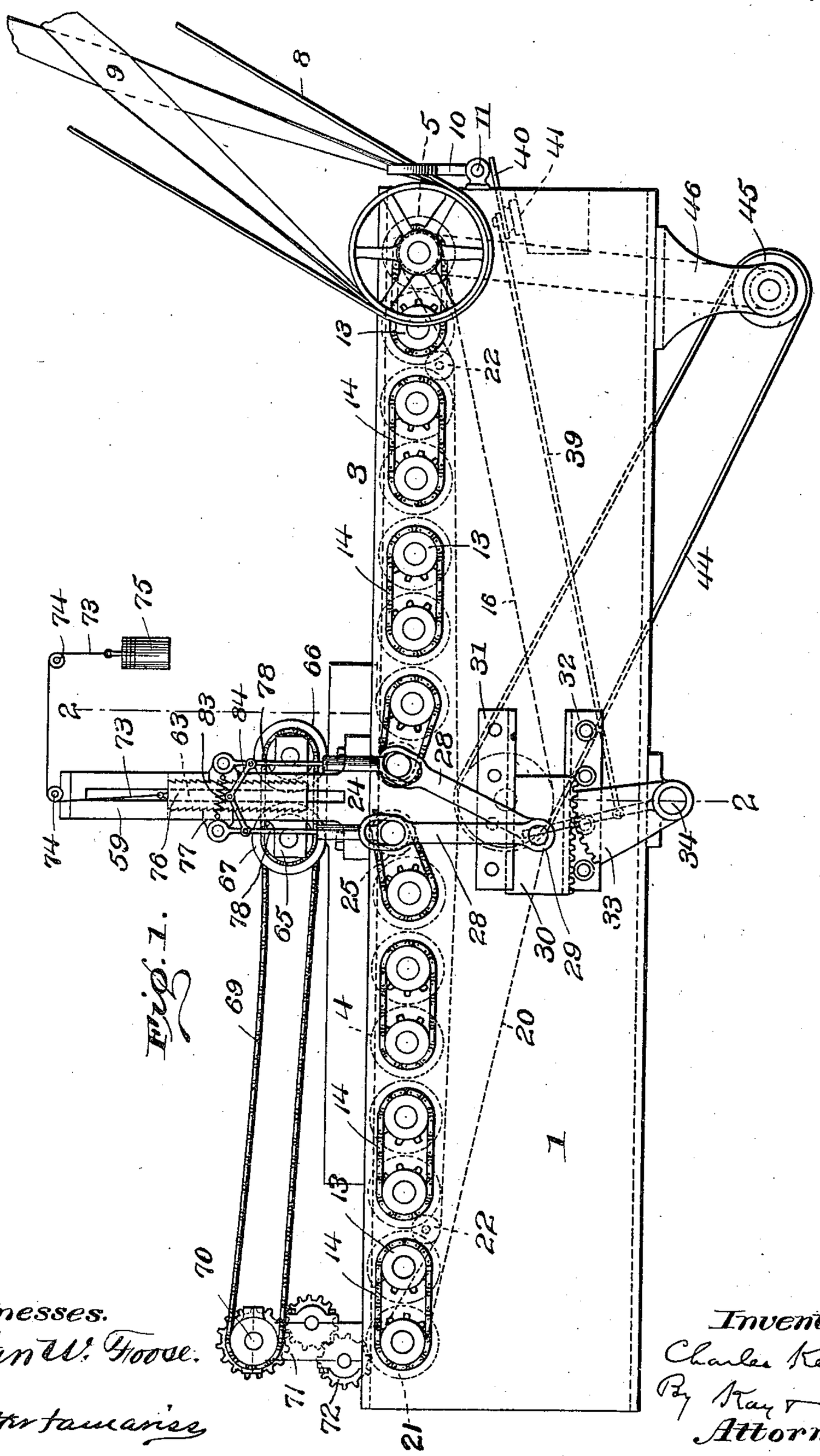


Fig. 1.

Witnesses.
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## GLUE CUTTING MACHINE.

(Application filed May 9, 1900.)

(No Model.) 4 Sheets—Sheet 2.

Fig. 2.

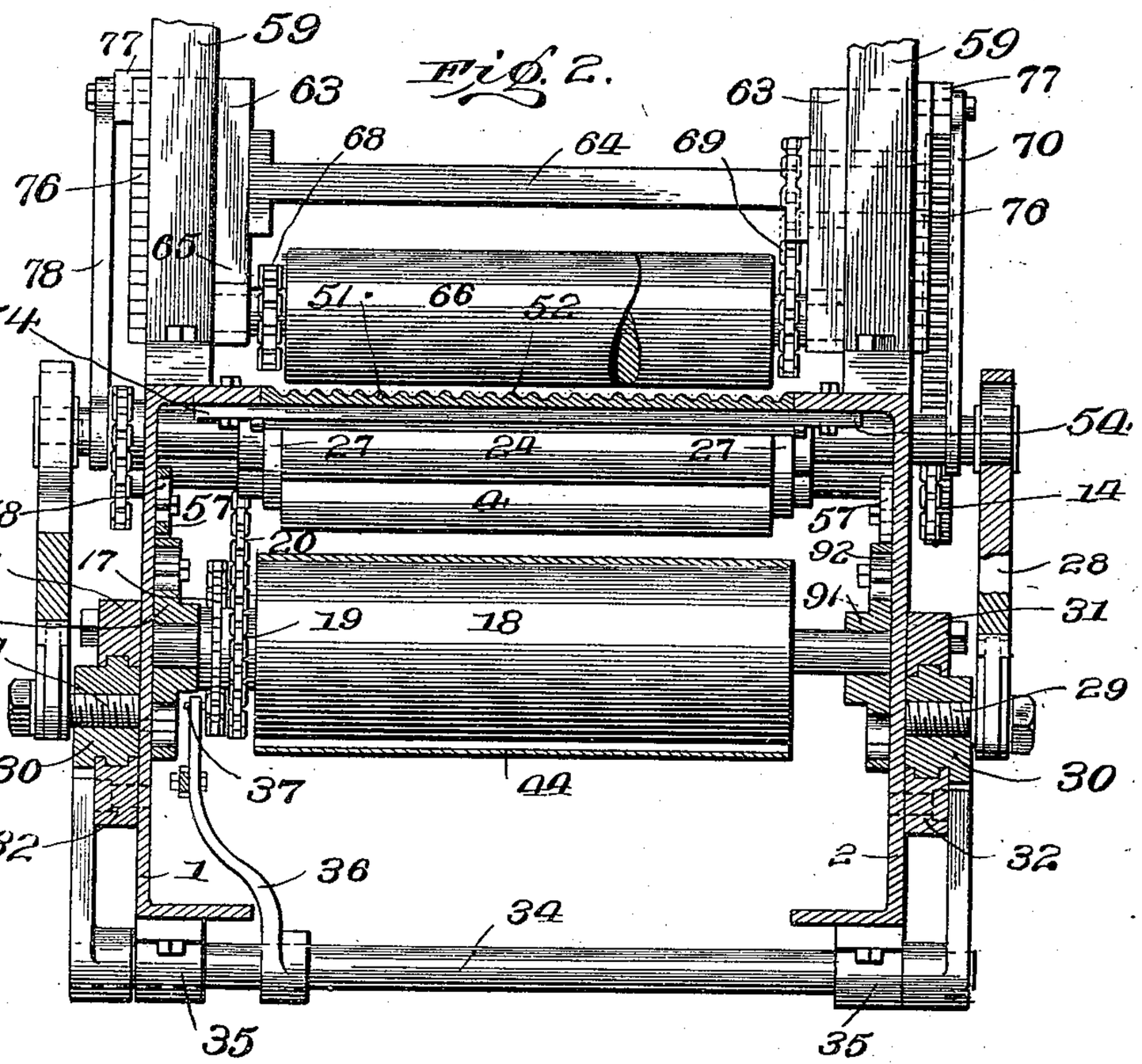
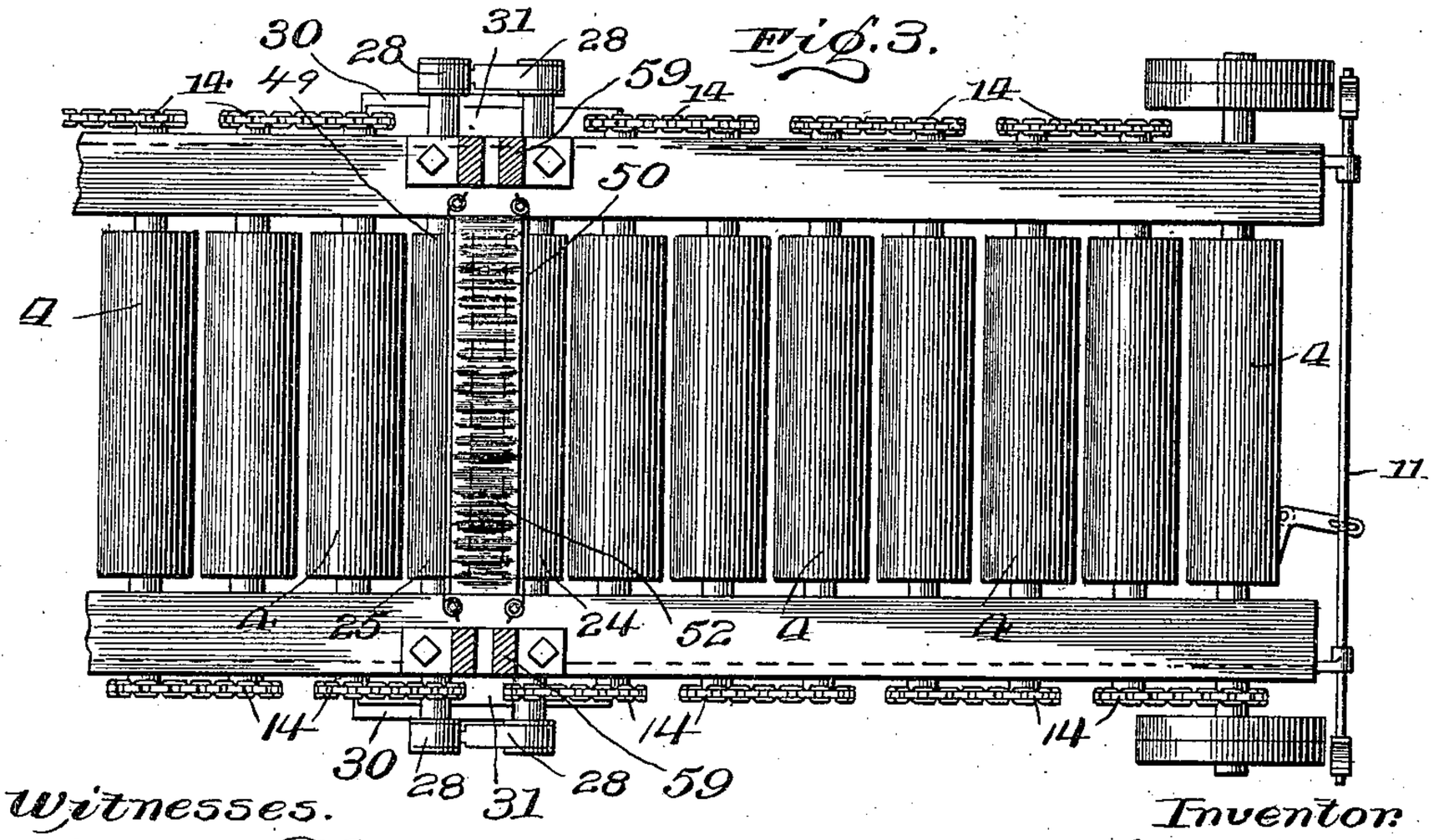



Fig. 3.




Witnesses.
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## GLUE CUTTING MACHINE.

(Application filed May 9, 1900.)

(No Model.) 4 Sheets—Sheet 3.

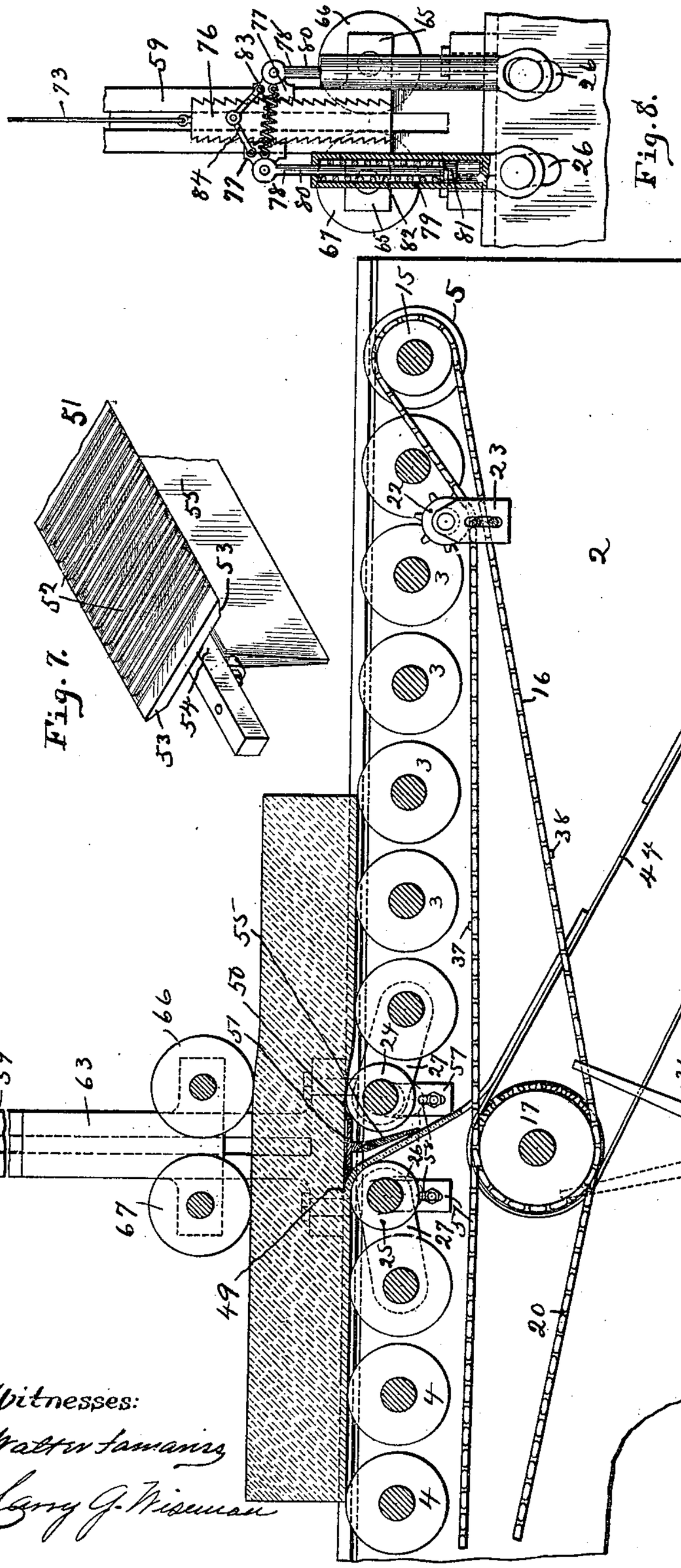


Fig. 8.

Fig. 7.

Fig. 4.

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## GLUE CUTTING MACHINE.

(No Model.) (Application filed May 9, 1900.)

4 Sheets—Sheet 4.

Fig. 5.

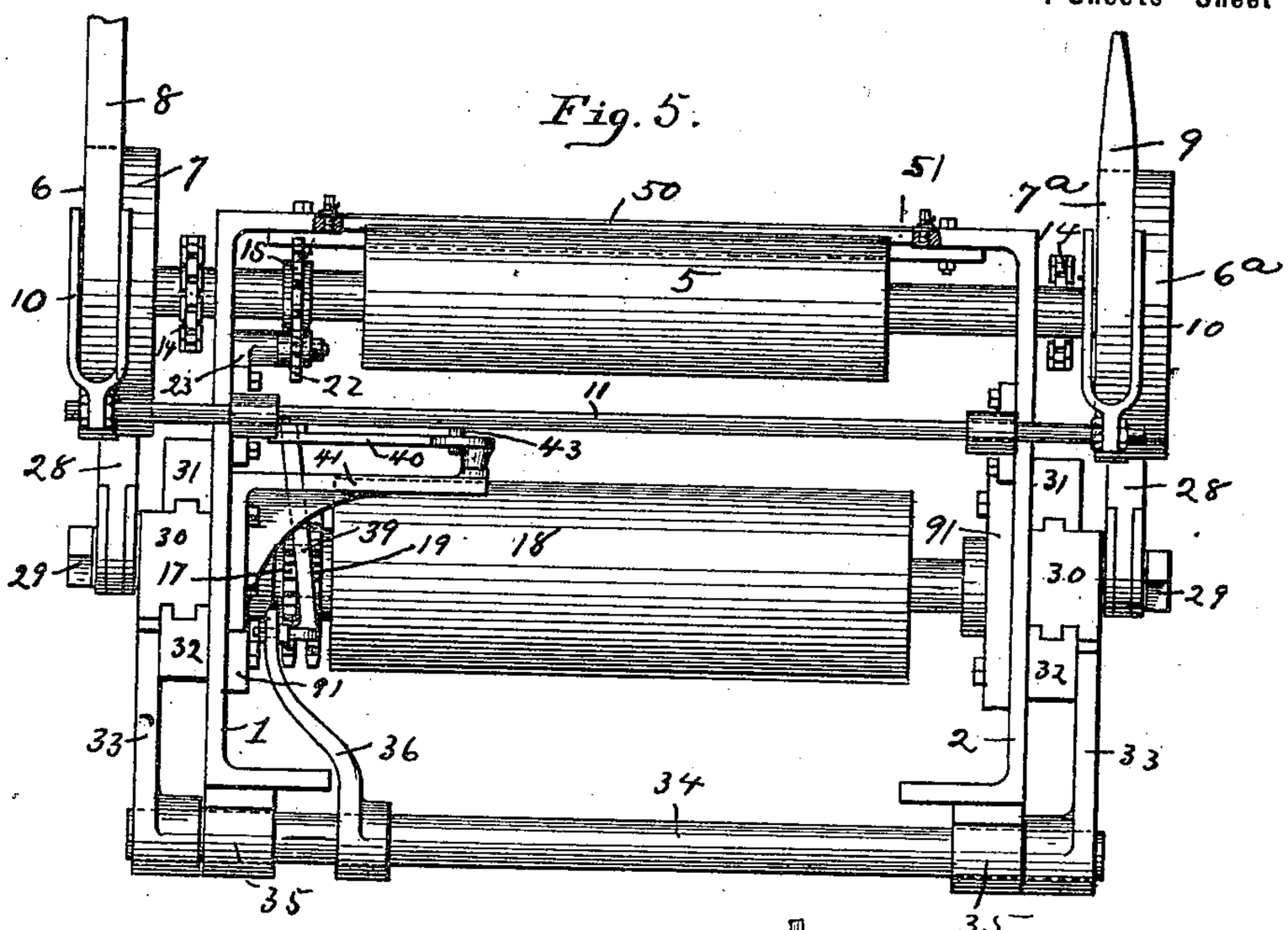
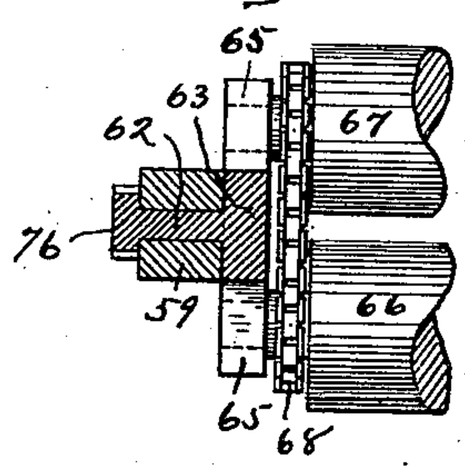



Fig. 6.



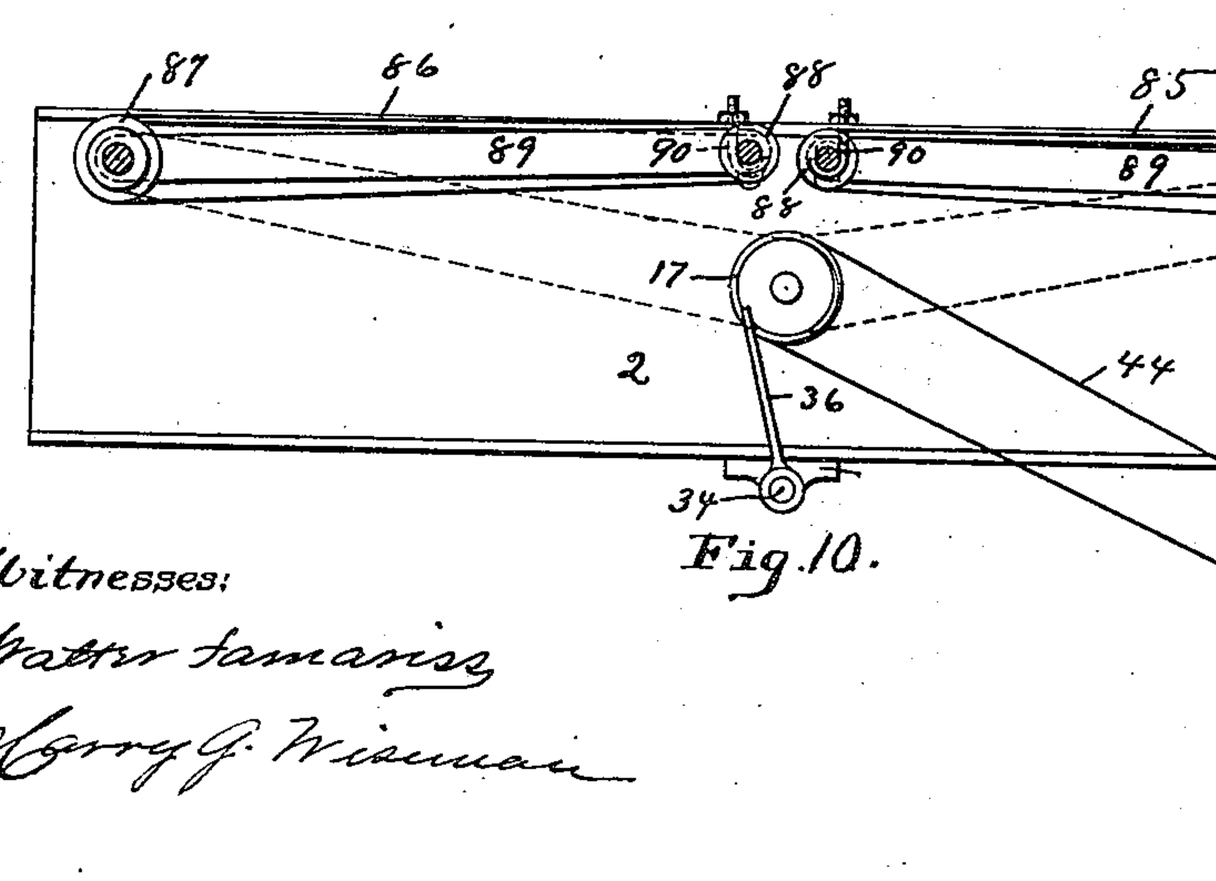




Fig. 9.




Fig. 10.

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# UNITED STATES PATENT OFFICE.

CHARLES KELLER, OF WILKINSBURG, PENNSYLVANIA.

## GLUE-CUTTING MACHINE.

SPECIFICATION forming part of Letters Patent No. 667,533, dated February 5, 1901.

Application filed May 9, 1900. Serial No. 16,026. (No model.)

*To all whom it may concern:*

Be it known that I, CHARLES KELLER, a resident of Wilkinsburg, in the county of Allegheny and State of Pennsylvania, have invented a new and useful Improvement in Glue-Cutting Machines; and I do hereby declare the following to be a full, clear, and exact description thereof.

My invention relates to an improved machine for cutting glue blocks into sheets, and has for its object to provide a machine of this character which will automatically and continuously cut a glue block into sheets and which occupies much less space than the machines now in use.

In the old form of machines for cutting glue blocks into sheets the block is fed in succession to a series of cutting-wires, each of which cuts a sheet of glue from the block until the latter is entirely consumed. The block during the cutting operation travels continuously in one direction, and inasmuch as the block is cut into a large number of sheets it requires a corresponding number of cutting-wires and carrying devices, which make a machine that is very long and occupies a great deal of space, and the object of the present invention is to overcome this objection and provide a machine which operates continuously and automatically to cut a glue-block into sheets and which is of much less length than the old form of machine.

To this end it consists of a carrier for the glue block, cutting devices adjacent said carrier, and means for reversing the direction of travel of the carrier, so that the glue block is carried alternately in opposite directions, the cutting devices being so arranged as to cut a sheet from the block in both directions of travel of the carrier.

My invention further consists in details of construction in a machine of this character, as will hereinafter more fully appear in the specification and claims.

To enable others skilled in the art to make and use my invention, I will now describe the same more fully, referring to the accompanying drawings, in which—

Figure 1 is a side view of my improved glue-cutting machine. Fig. 2 is a transverse vertical section of the same on the line 2 2, Fig. 1. Fig. 3 is a plan view of one end of the machine. Fig. 4 is a longitudinal vertical section of the machine, parts thereof being omitted for the sake of clearness. Fig. 5 is an end view of the machine. Fig. 6 is a sectional detail of the pressure-rollers. Fig. 7 is a perspective view of the bridge and guard-plate. Fig. 8 is a detail, on an enlarged scale, partly in section, of the means for feeding the pressure-rollers downward. Fig. 9 is a detail of the reversing mechanism, and Fig. 10 is a modification showing the use of belts or aprons instead of positively-driven carrier-rollers.

The frame of the machine consists of the side frames 1 and 2, each consisting of a channel-beam having an upper and a lower flange, and suitable cross-braces (not shown) between said beams. On the side frames all of the operative parts of the machine are mounted. In the upper part of these side frames are mounted two series of horizontal rollers 3 and 4, each series consisting of eight rollers, seven of which are mounted in a horizontal line and are of the same diameter, while the eighth and inner one of each series is of lesser diameter than the others and mounted so as to have a limited movement up and down. The end roller 5 of the series 3 has its journals extended beyond the frame of the machine and upon one end has mounted a fast pulley 6 and a loose pulley 7 and on the other end corresponding pulleys $6^a$ $7^a$, the pulleys 6 7 having running thereon the straight belt 8, and the pulleys $6^a$ $7^a$ having running thereon the cross-belt 9. These belts are engaged by the shifting-forks 10 10, secured to the sliding rod 11, mounted in the side frames of the machine, said rod being moved endwise by mechanism, hereinafter to be described, to shift the belts 8 9 alternately from the fast to the loose pulleys in order to reverse the machine.

The rollers of the series 3 are driven from the end roller 5 by means of the sprocket-wheels 13 and sprocket-chains 14, said sprocket-chains connecting two adjacent rollers and being arranged alternately on opposite ends of the roller-shafts, so that said rollers are connected in pairs and all driven at a uniform rate of speed and in the same direction. The sprocket-wheels 13 and chains 14 are on the outside of the side frames of the machine.

Inside of the side frame 1 of the machine, on the shaft of the roller 5, is secured a sprocket-wheel 15, which is connected by means of a sprocket-chain 16 to a sprocket-wheel 17, running loosely on the shaft of a roller 18, journaled in suitable bearings secured to the side frames midway of the length of the machine and a considerable distance below the upper edges of the side frames. Also running loosely on the shaft of the roller 18 is a sprocket-wheel 19 of the same size as sprocket-wheel 17 and rigidly secured thereto, so that said wheels rotate as a single wheel. The sprocket-wheel 19 is connected by a sprocket-chain 20 to a sprocket-wheel on the shaft of the end roller 21 of the series 4 for imparting motion to said end roller. The other rollers of the series 4 are coupled in pairs by means of sprocket-wheels 13 and chains 14, arranged alternately on opposite ends of the roller-shafts and outside the side frames of the machine in the same manner that the rollers of the series 3 are driven from the end roller 5 of that series. In order that the sprocket-chains 16 and 20 may not come in contact with the roller-journals of each series, the upper reach of each of said chains passes under a guide-roller 22, suitably mounted in a bracket 23, adjustably secured to the side frame 1 of the machine.

The rollers 24 25 at the inner end of each series are of smaller size than the other rollers in the series and have their journals projecting through slots 26 in the side frames of the machine, so that said rollers 24 and 25 may be moved up and down, each roller 24 25 being connected by means of a yoke 27 to the next adjacent roller-shaft, so that the rollers 24 25 are always a fixed distance from the adjacent rollers. The rollers 24 25 are positively driven by being connected through sprocket-and-chain mechanism 13 14, as above described, with the next adjacent roller. The ends of the shafts of the rollers 24 and 25 extend through slots in the upper ends of the links 28, said links being pivoted at their lower ends upon the stud-bolt 29, secured to the slide 30, one on each side of the machine. The slides 30 are provided on their upper and lower surfaces with tongues which fit in grooves in guideways 31 32, secured to the side frames of the machine by means of suitable bolts. The slides 30 are provided with flanges having rack-teeth cut in their lower surfaces, which teeth are engaged by the teeth of the segments 33, secured to the rock-shaft 34, mounted in suitable bearings 35, secured to the bottom webs of the side frames. The guides 32 are provided with countersunk holes for receiving the head of the bolts which secure the guides to the side frames of the machine in order that the heads of the bolts may not interfere with the movement of the segments 33.

Secured to the rock-shaft 34, inside of the side frame 1 of the machine, is an arm 36, which projects upwardly and has its end lying in close proximity to the sprocket-chain 16, before described. Suitably secured to the sprocket-chain 16 at the proper distance apart are stops 37 38, which as the chain 16 travels in either direction alternately come in contact with the end of the arm 36 and move the same, so as to rock the shaft 34. Pivotally connected to the arm 36 is a rod 39, which at its outer end is pivotally connected to one arm of a bell-crank lever 40, pivoted on a bracket 41, secured to the side frame of the machine, the opposite end of said bell-crank lever being slotted, as at 42, for receiving a pin 43, secured to the sliding rod 11 of the belt-shifter.

Passing over the roller 18 is an apron 44, running in a downwardly-inclined direction over a roller 45, journaled in depending brackets 46, secured to the lower flanges of the side frames. The roller 45 is driven by means of a sprocket-chain 47, running over a suitable sprocket-wheel secured to the shaft of the roller 45 and a similar wheel secured to the shaft of the roller 5. The apron 44 receives the sheets of glue cut from the bottom of the block and conveys them to the nets 48, which are carried by suitable mechanism underneath the machine, which mechanism forms no part of my present invention and is not herein shown.

Mounted above the rollers 24 and 25 are cutting-wires 49 and 50 for cutting the sheet from the lower side of the glue block carried on the rollers 3 4. Between the cutting-wires 49 50 is a bridge 51, suitably secured to the upper flanges of the side frames of the machine, said bridge serving to support the glue block when passing from one wire to the other. To reduce the friction of the glue block on the bridge 51, the latter has its upper surface grooved transversely, as at 52, to provide transverse ribs on the upper face thereof. The grooves 52 do not extend entirely across the bridge, but run to the surface just before reaching the edge, so as to leave the edge of the bridge unbroken to prevent it from tearing the glue block. The bridge 51 is preferably made from a T-bar having its lower outer corners beveled off, as at 53, and having a short depending rib 54.

As a sheet of glue is cut from the glue-block by means of the wire 49, for instance, it passes down between the bridge and the roller 24 and is received upon the apron 44, before described. Should the sheet of glue, however, be stiff, there is danger that it would strike against the opposite roller 25 and be carried up between the same and the bridge. In order to prevent this, I hinge a guard-plate 55 to the lower edge of the depending rib 54 of the bridge, this guard-plate being of sufficient length to project below the tangential surface of the rollers 24 25.

The slots in the upper ends of the links 28 are of sufficient length to allow for the greatest up-and-down movement of the rollers 24 25 that may be desired, and in order to regulate the extent of movement of said rollers, and consequently the thickness of the sheet

being cut from the glue block, I provide suitable bearings or stops 57, having an upper concave face for receiving the journals of the rollers 24 25 and being provided with slots 58, by means of which said stops may be adjusted to any desired height, and thereby limit the downward movement of the rollers 24 25 to properly space said rollers with reference to the cutting-wires 49 50 to cut a sheet of the desired thickness.

In order to prevent the glue block rising when passing over the cutting-wires, I provide means for holding the block down upon the rollers 34, which means I will now describe. Suitably bolted to the upper flanges of the side frames of the machine are standards 59, connected at their tops by the cross-piece 60, said standards 59 being slotted to receive tongues 62, secured to the side bars of a sliding frame 63, said frame having a cross-bar 64 connecting the side bars thereof and having the horizontal bars 65 secured to the lower end of the side bars. On the horizontal bars 65 are mounted the rollers 66 67 for bearing on the upper surface of the glue block. The rollers 66 67 are connected at one end by the sprocket-and-chain mechanism 68, so that said rollers will rotate together and in the same direction, and the roller 67 is connected at its opposite end by a sprocket-chain 69 with a sprocket-wheel secured to a stub-shaft 70, mounted in the uprights 71. The stub-shaft 70 has secured thereto a spur-gear which is connected by means of two intermediate spur-gears 72 with a spur-gear on the end of the shaft of the roller 21.

The frame 63 has connected thereto a rope or chain 73, running over suitable pulleys 74 and carrying at its opposite end the adjustable counterweight 75, which is of sufficient weight to normally hold the sliding frame and rollers 66 67 away from the glue block. In order to hold the rollers 66 67 in contact with the upper surface of the glue block and feed the frame downward at the same rate that the glue block is reduced in thickness, I secure to the tongues 62 of the frames suitable bars 76, said bars having ratchet-teeth cut on their opposite edges, the teeth on one edge being staggered with relation to the teeth on the opposite edge. Engaging with the teeth on the bars 76 are suitable serrated blocks 77, said blocks being connected to the upper ends of links 78, the lower ends of which are connected to the journals of the rollers 24 25. In order to hold the rollers 66 67 with a yielding pressure on the upper surface of the glue block, the links 78 are made in two sections 79 and 80, the section 79 being a tube and the section 80 being a rod telescoping in said tube and provided at its lower end with a head 81, between which head and the upper inturned end of the tube 79 is placed a stiff coiled spring 82. In order to hold the blocks 77 against the teeth on the ratchet-bars 76, I connect them by means of the spring 83. Suitable toggle-links 84 are secured at one end of the blocks 77, their opposite ends being pivoted to each other, so that by merely pressing upon the pivotal point of said links the blocks 77 will be forced outward against the tension of the spring 83, thereby releasing the ratchet-bars 76 and permitting the counterweight 75 to raise the sliding frame 63 and rollers 66 67.

While I have shown the cutting devices 49 and 50 as wires, I wish it understood that any thin flexible device that can be put under tension may be used instead—such as, for instance, a flattened wire or an exceedingly thin metallic ribbon which is capable of being tightly stretched across the machine—and by the term "cutting-wire," as used in the claims, I intend to include all such devices.

Instead of the series 3 4 of positively-driven rollers I may employ suitable belts or aprons 85 86, Fig. 9, which pass over rollers 87 88, the rollers 87 being journaled in the side frames on the machine and the rollers 88 being journaled in the outer end of side frames 89, which are pivoted on the shafts of the rollers 87, so as to permit an up-and-down movement of the rollers 88 in the same manner that the rollers 24 25 are moved up and down. The downward movement of the rollers 88 may be limited by suitable stops, as above described, or by means of the hooks 90, having their stems projecting through the upper flanges of the side frames and provided with suitable nuts for adjusting them up and down. These hooks may be used in place of the stops 57 in connection with the positively-driven rollers 24 25.

It is desirable to provide means for adjusting the distance between the rollers 24 25 and the apron 44 to allow for different thicknesses of glue sheets being cut. To this end the roller 18 is journaled in bearings 91, provided with vertical slots 92, through which pass bolts for securing said bearings to the side frames of the machine.

The operation of the machine is as follows: The glue block is placed upon the series of rollers 3 and when the machine is set in operation is made to travel over said rollers. The slides 30 are in the position illustrated in Fig. 1, so that the roller 24 is in its lowermost position while the roller 25 is elevated. As the glue block travels through the machine from right to left the cutting-wire 49 cuts a sheet of glue from the lower side thereof, which sheet passes down and upon the belt 44, which conveys it to the net 48, the glue block passing over the bridge 41 on to the series of rollers 4. After it has passed beyond the wire 50 the stop 37 on the chain 16, which has been set at the proper point, comes in contact with the end of the arm 36 on the rock-shaft 34, moving the arm and rocking the shaft, which through the connecting-rod 39, bell-crank lever 40, sliding rod 11, and belt-shifter forks 10 shifts the belt 8 from the tight pulley 6 to the loose pulley 7 and the cross-belt 9 from the loose belt $7^a$ to the tight pulley $6^a$, thereby reversing the ma-

chine. At the same time the rock-shaft 34 through the segments 33 moves the slides 30 toward the right, carrying the lower end of the links to a point substantially in a straight line below the journal of the roller 24, thereby raising the roller 24 and lowering the roller 25, so that when the glue block travels in the opposite direction the wire 50 will cut a sheet from the lower side thereof. When the roller 25 drops, the pressure-rollers 66 67 are fed downward by means of the links 78, serrated blocks 77, and ratchet-bars 76, connected to the sliding frame, and when the machine is again reversed the dropping of the roller 24 will move said rollers and sliding frame down in a similar manner. By means of the stops 37 38 on the chain 16 the machine is automatically reversed at each end of the travel of the glue block, and this will be continued until the glue block is entirely cut into sheets.

What I claim, and desire to secure by Letters Patent, is—

1. In a machine for cutting glue, the combination with a traveling carrier for the glue block, of a cutting-wire arranged to cut a sheet from the block, and means for reversing the direction of travel of the carrier.

2. In a machine for cutting glue, the combination with traveling carriers for the glue block, of a cutting device adjacent the meeting ends of said carriers, and means for reversing the direction of travel of the carriers.

3. In a machine for cutting glue, the combination with traveling carriers for the glue block, of cutting devices adjacent to meeting ends of the carriers, means for alternately raising and lowering the meeting ends of said carriers, and means for reversing the direction of travel of the carriers.

4. In a machine for cutting glue, the combination with traveling carriers for the glue block, cutting-wires adjacent the meeting ends of said carriers, a bridge between said wires, and means for reversing the direction of travel of said carriers.

5. In a machine for cutting glue, the combination with traveling carriers for the glue block, cutting-wires adjacent the meeting ends of said carriers, a bridge between said wires, means for alternately raising and lowering the meeting ends of the carriers, and means for reversing the direction of travel of said carriers.

6. In a machine for cutting glue, the combination with traveling carriers for the glue block, cutting devices adjacent the meeting ends of said carriers, means for reversing the direction of travel of said carriers, a sliding block, and links connecting said block with the meeting ends of the carriers for alternately raising and lowering the same.

7. In a machine for cutting glue, the combination with traveling carriers for the glue block, said carriers consisting of a series of driven rollers, means for alternately raising and lowering the end roller of each series, a cutting device adjacent said end rollers, and means for reversing the direction of rotation of the driven rollers.

8. In a machine for cutting glue, the combination with traveling carriers for the glue block, said carriers consisting of a series of driven rollers, a sliding block, links connecting said block with the end roller of each series, a cutting device adjacent said end rollers, and means for reversing the direction of rotation of the driven rollers.

9. In a machine for cutting glue, the combination with a traveling carrier for the glue block, a cutting device close to the traveling carrier to cut a sheet from the lower side of the block, means for raising and lowering the carrier adjacent the cutting device, and an adjustable stop to limit the downward movement of the carrier.

10. In a machine for cutting glue, the combination with traveling carriers for the glue block, of cutting devices adjacent the meeting ends of the carriers, means for alternately raising and lowering the meeting ends of the carriers, adjustable stops to limit the downward movement of the carriers, and means for reversing the direction of travel of the carriers.

11. In a machine for cutting glue, the combination with traveling carriers for the glue block, of cutting devices adjacent the meeting ends of the carriers, means for reversing the direction of travel of said carriers, and means controlled by the reversing means for alternately raising and lowering the meeting ends of the carriers.

12. In a machine for cutting glue, the combination with traveling carriers for the glue block, cutting devices adjacent the meeting ends of said carriers, means for reversing the direction of travel of said carriers, a sliding block, links connecting said block with the adjacent ends of the carriers for alternately raising and lowering the same, and connections between the reversing means and the block for reciprocating the latter.

13. In a machine for cutting glue, the combination with a traveling carrier for the glue block, of a cutting device, delivery means adjacent the cutting device to deliver the sheet from the machine, and means for reversing the direction of travel of the carrier.

14. In a machine for cutting glue, the combination with traveling carriers for the glue block, of cutting devices adjacent the meeting ends of said carriers, delivery means adjacent the cutting devices to deliver the sheet from the machine, and means for reversing the direction of travel of the carriers.

15. In a machine for cutting glue, the combination with traveling carriers for the glue block, cutting-wires adjacent the meeting ends of said carriers, a bridge between said wires, delivery means below said bridge for receiving the sheet and delivering it from the machine, and means for reversing the direction of travel of said carriers.

16. In a machine for cutting glue, the com-

bination with traveling carriers for the glue block, of a cutting device adjacent the meeting ends of the carriers, a guard-plate below the cutting device and projecting between the meeting ends of the carriers, and means for reversing the direction of travel of the carriers.

17. In a machine for cutting glue, the combination with traveling carriers for the glue block, cutting-wires adjacent the meeting ends of said carriers, a bridge between said wires, a guard-plate hinged below the bridge and projecting between the meeting ends of the carriers, and means for reversing the direction of travel of the carriers.

18. In a machine for cutting glue, the combination with a traveling carrier for the glue block, means for cutting a sheet from the lower side of said block, and means for maintaining a yielding pressure on the block during the cutting operation.

19. In a machine for cutting glue, the combination with a traveling carrier for the glue block, means for cutting a sheet from the lower side of said block, positively-driven rollers bearing on the upper side of the block, and means for holding said rollers on the block with a yielding pressure.

20. In a machine for cutting glue, the combination with a traveling carrier for the glue block, means for cutting a sheet from the lower side of the block, means for reversing the direction of travel of said carrier, and means bearing on the upper side of the block to hold the same on the carrier during the cutting operation, said bearing means being automatically fed downward at the same rate that the glue block diminishes in thickness.

21. In a machine for cutting glue, the combination with a traveling carrier for the glue block, means for cutting a sheet from the lower side of the block, means for reversing the direction of travel of the carrier, and positively-driven rollers bearing on the upper side of the block, said rollers being automatically fed downward at the same rate that the glue block diminishes in thickness.

22. In a machine for cutting glue, the combination with traveling carriers for the glue block, cutting devices adjacent the meeting ends of the carriers, means for alternately raising and lowering the meeting ends of the carriers, means for reversing the direction of travel of the carriers, yielding means bearing on the upper side of the block, and means for automatically moving said yielding means downward at each reversal of the carriers a distance equal to the thickness of the sheet cut off.

23. In a machine for cutting glue, the combination with traveling carriers for the glue block, cutting devices adjacent the meeting ends of the carriers, means for alternately raising and lowering the meeting ends of the carriers, means for reversing the direction of travel of the carriers, a movable frame bearing on the upper side of the block, and connections between said frame and the movable end of the carriers for moving said frame downward at each reversal of the carriers.

24. In a machine for cutting glue, the combination with traveling carriers for the glue block, cutting devices adjacent the meeting ends of said carriers, means for alternately raising and lowering the meeting ends of the carriers, means for reversing the direction of travel of the carriers, a counterbalanced frame bearing on the upper side of the glue block, and elastic connections between the movable ends of said carriers and said frame, for moving the latter downward at each reversal of the carriers.

25. In a machine for cutting glue, the combination with traveling carriers for the glue block, cutting devices adjacent the meeting ends of said carriers, means for alternately raising and lowering the meeting ends of the carriers, means for reversing the direction of travel of the carriers, positively-driven rollers bearing on the upper side of the glue block, and elastic connections between the movable ends of the carriers and said rollers for moving the latter downward at each reversal of the carriers.

26. In a machine for cutting glue, the combination with the reversible carriers for the glue block, of cutters adjacent said carriers, means for raising and lowering the meeting ends of said carriers, a frame bearing on the upper side of the glue block, said frame provided with two racks, the teeth of which are staggered with relation to each other links connected to the movable end of each carrier, and provided with serrated heads for engaging said racks.

In testimony whereof I, the said CHARLES KELLER, have hereunto set my hand.

CHARLES KELLER.

Witnesses:
F. W. WINTER,
ROBERT C. TOTTEN.