No. 751,546. PATENTED FEB. 9, 1904.

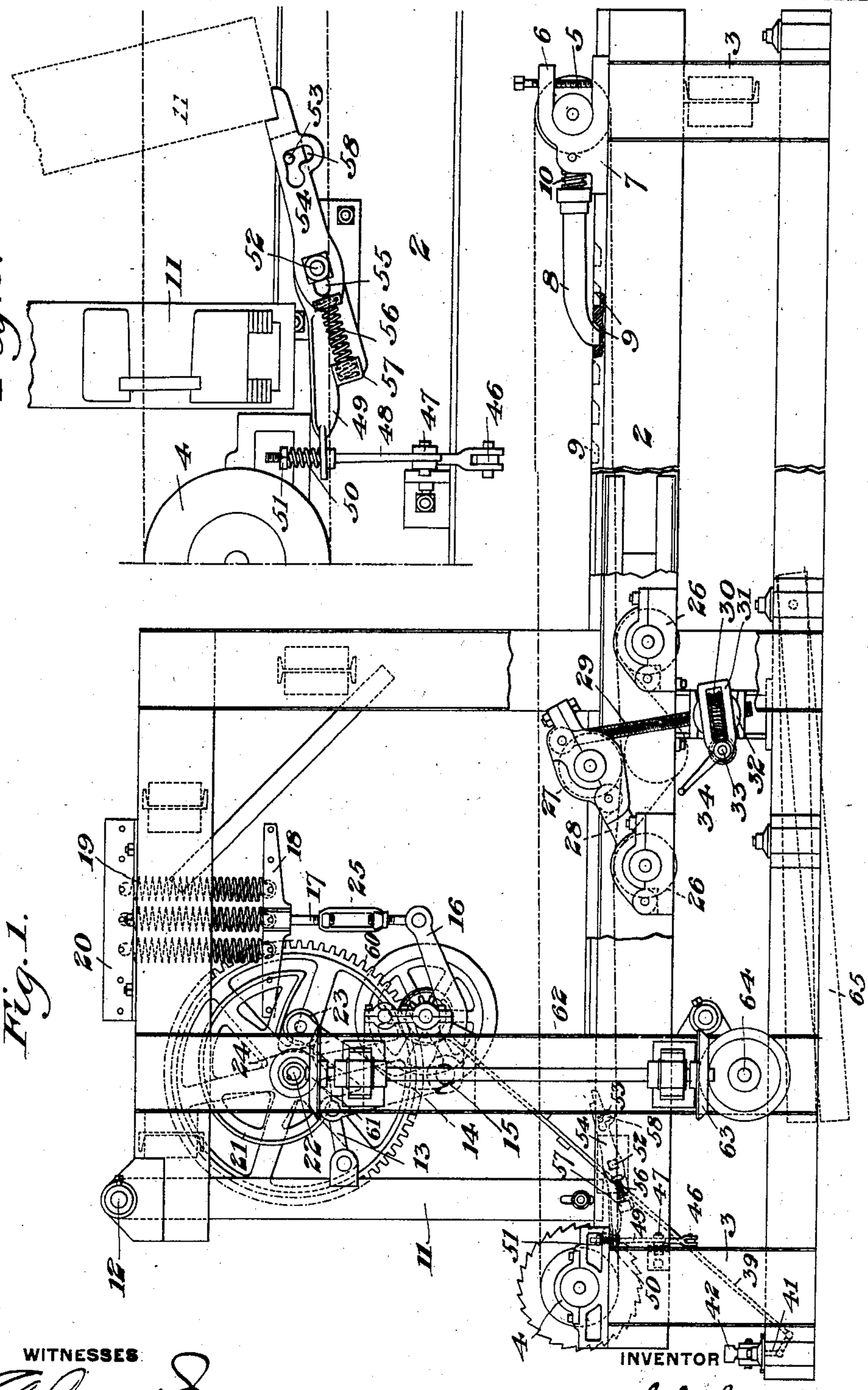
I. J. NERACHER.

WIRE LOOM.

APPLICATION FILED MAR. 27, 1902.

NO MODEL. 2 SHEETS—SHEET 1.

Fig. 1.



WITNESSES

L. A. Somers

A. M. Corwin

INVENTOR

I. J. Neracher

by Baldwin & Byrnes

his attys.

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NO MODEL. 2 SHEETS—SHEET 2.

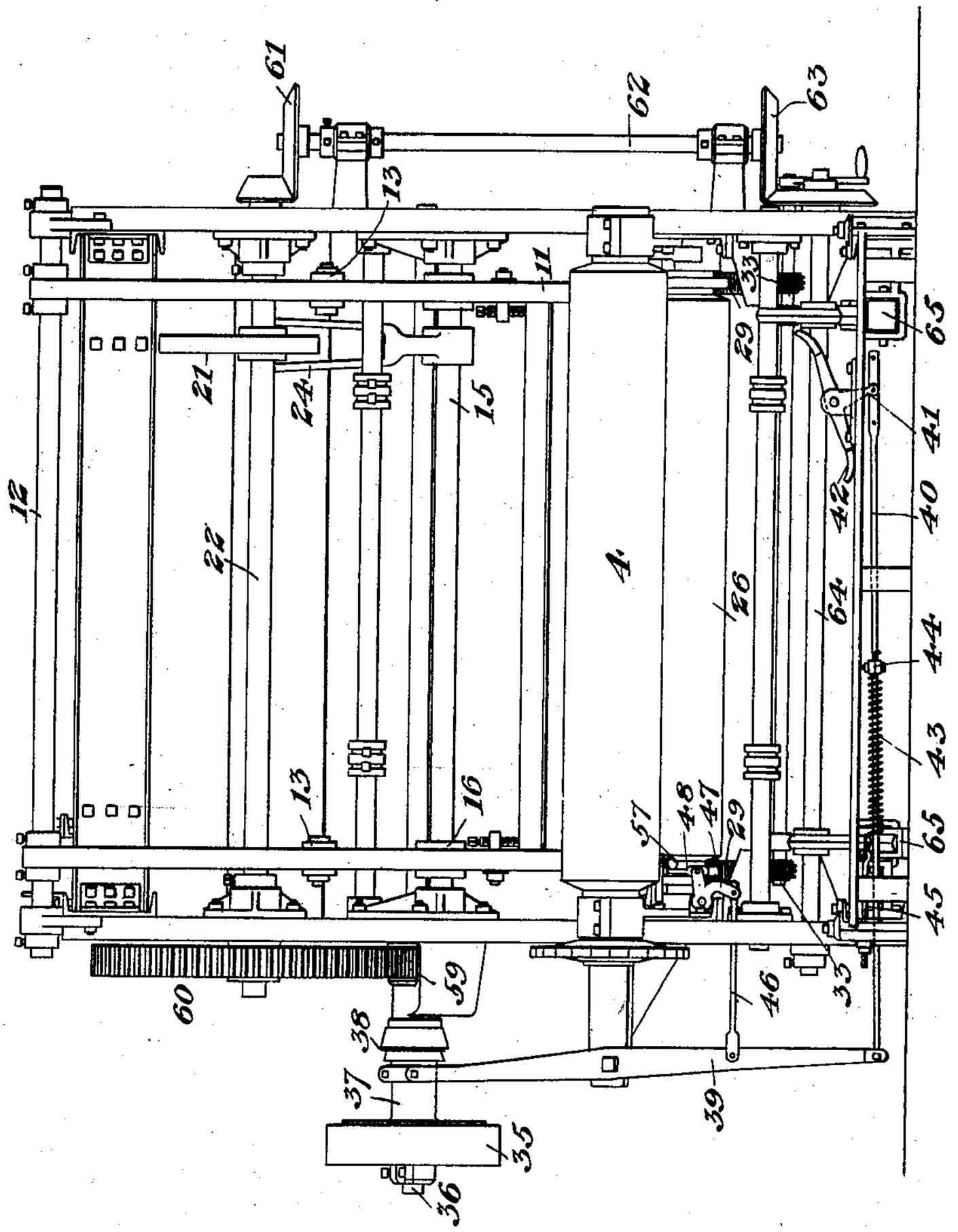

Fig. 2.

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No. 751,546. Patented February 9, 1904.

UNITED STATES PATENT OFFICE.

INOZENS J. NERACHER, OF CLEVELAND, OHIO.

WIRE-LOOM.

SPECIFICATION forming part of Letters Patent No. 751,546, dated February 9, 1904.

Application filed March 27, 1902. Serial No. 100,214. (No model.)

To all whom it may concern:

Be it known that I, INOZENS J. NERACHER, of Cleveland, Cuyahoga county, Ohio, have invented a new and useful Wire-Loom, of which the following is a full, clear, and exact description, reference being had to the accompanying drawings, forming part of this specification, in which—

Figure 1 is a side elevation, partly broken away, of my improved loom. Fig. 2 is a front elevation of the same; and Fig. 3 is a detail side elevation, on a larger scale, of the stop device for the lay.

My invention relates particularly to that class of wire-looms wherein the warp-wires extend around two rollers at opposite ends of a bed, one of these being the breast-roll.

The objects of the invention are to provide improved mechanism for actuating the lay or beater; to provide improved mechanism for applying a frictional resistance to the warp-wires, thus enabling a greater crimp to be given to the warp-wires, and, further, to provide a stop device which will be interposed in the path of the lay and stop its forward stroke when the operator stops the machine too late to prevent the lay from making its stroke.

In the drawings I show a longitudinal bed 2, carried upon suitable end supports 3 and having bearings for the breast-roll 4 and the rear roll 5. This rear roller is carried in yoke-shaped bearings 6 upon slides 7, which move upon suitable slideways on the bed and may be held at any adjusted point by the tilting dog 8, which engages any one of a series of recesses 9 in the bed. This dog preferably consists of a hollow and internally-screw-threaded pipe which engages a screw-threaded stem 10, so that the legs of the dog may be adjusted as desired. The warp-wires extend around these two rollers 4 and 5 and are secured at both ends to a tie-rod in the usual manner. The lay or beater 11 is pivoted at its upper end at 12 and is connected by links 13 with levers 14, secured to the shaft 15. One of these levers 14 is provided with an integral rear extension 16, having an adjustable link connection 17 with a cross-bar 18, provided with a series of pins, to which are secured the lower ends of any desired number of spiral springs 19, the upper ends of which are removably secured to similar pins upon an upper stationary cross-bar 20.

To draw the lay back against the tension of the springs, I provide the cam 21 upon the shaft 22, this cam acting upon a roller 23, mounted in a forked lever 24, extending from and secured to the shaft 15. The cam rotates in a counter-clockwise direction and through the lever connection with the rock-shaft 15 draws the lay rearwardly until the cam releases the roller, when the springs will then drive the lay forward with a force proportionate to the number of springs and their tension, which is adjusted by the turnbuckle connection 25 of the link 17.

The warp-wires form an endless belt around the rolls 4 and 5, and this belt moves under each stroke of the lay. The blow delivered by the lay upon the shoot-wires will serve to crimp the warp-wires, provided these are slack enough to allow crimping and at the same time so firmly held that the belt does not move forward too freely under the blow. In order to increase the frictional resistance on these wires and enable a greater crimp to be imparted than that now obtained, I provide a pair of friction elements upon one side of the warp-wires and another friction device between the first two and upon the opposite side of the wires. By adjusting the intermediate friction device the frictional resistance on the warp-wires may be increased to any desirable extent and adjusted as wished. Thus in the drawings I show the pair of friction elements as consisting of rollers 26, mounted in stationary bearings upon the frame and below the warp-wires, and the other friction element as consisting of an upper roller 27 above the warp-wires and between the lower two rollers.

The upper roller is mounted in bearings upon swinging arms 28, which may be loosely pivoted about the trunnions of the roller 26, and the bearings for roller 27 are provided with pivotal screw-threaded rods 29, which extend down through screw-threaded central holes in worm-wheels 30. The bearings of the worm-wheels are mounted in yokes 31, carried upon a rocking frame 32, which allows turning of the worm-wheels into different po-

sitions corresponding to different positions of the roller 27. The worm-wheels both engage worms upon a shaft 33, having an actuating-crank 34. By turning the crank in either direction the frictional resistance to the drawing of the warp-wires may be increased or diminished, as desired.

I will now describe my stop device for stopping the forward stroke of the lay where the operator does not properly insert the shoot-wire, and consequently the lay should not deliver its blow. In such case the operator often is unable to stop the motion of the machine soon enough to prevent the start of the blow, and hence the lay must finish its stroke and injures the fabric by reason of the shoot-wire being absent or misplaced. To overcome this difficulty, I provide both a quick-acting brake, which is automatically applied when the operator releases the driving connection, and also provide a stop which is moved into the path of the lay, so that even if the lay has started its stroke it will not deliver the blow. The driving-pulley 35 is loosely held upon the shaft 36, upon which is splined a double clutch member 37, having at its outer end an annular inclined face to engage a similar face on the driving-wheel, while its inner end has a similar inclined face to enter and engage an annular friction-brake 38, mounted on a frame. The clutch member 37 is slid upon the shaft by lever 39, pivotally connected to a rod 40, actuated by a lever 41 from a shaft carrying a double foot-lever 42. A retractile spiral spring 43 surrounds the rod 40 and is secured at one end to an adjustable bracket 44 thereon, its other end being secured to an adjustable hook-bolt 45. Whenever the foot-treadle is released, the spring will withdraw the clutch member from the driving-pulley and immediately apply the brake. A link 46 connects the lower arm of the lever 39 to a bell-crank lever 47, pivoted on the frame and having an arm provided with a vertical pivoted rod 48, which extends through a hole in the lever 49 and is provided above the lever with spiral springs 50, held compressed by a nut 51. The lever 49 is loosely pivoted around a stub-shaft 52 and extends forwardly, its front portion being provided with a pin 53. A stop-lever 54 is provided with a rear slot 55, which surrounds the shaft 52, and this end of the lever 54 is pressed forwardly by a spring 56 between a stop on the end of this lever and a stop 57 on the lever 49. At its forward end the stop-lever 54 is provided with a slot 58 of peculiar form, having two legs extending at an angle to each other. One of these legs allows the stop to slide longitudinally of the lever 49, while the other allows it to rock thereon. Assuming that the operator has failed to insert the shoot-wire properly before the lay begins its stroke, he releases the foot-treadle, and the spring 43, acting through lever 39, link 46, and bell-crank 47, will draw down upon the rear end of the lever 49. At this time the pin is at the rear end of the slot 58, and consequently the levers tilt together and assume a position within the path of the lay near its starting-point. As the lay starts forward on its stroke it will strike the notched front end of lever 54 and will move it backward against the spring resistance 56, the pin moving to the front end of the slot 58. The parts are then as shown in Fig. 3.

When the operator starts the machine by depressing the foot-treadle, the actuating-cam will rotate it until it contacts with the roller 23, when the lay will be drawn back, and the weight will be taken off from the lever 54. When the operator depresses the treadle, he lifts the rear end of the lever 49, and the pin 53 moves down within the vertical leg of the slot 58. Consequently when the weight of the lay is removed by the cam the lever 54 will drop down at its front end until the pin reaches the top of the vertical leg, when the spring 56 will at once force it forward until the pin reaches the rear end of the horizontal leg. The stop is then in retracted or inoperative position.

To drive the treadles, I may use a pinion 59 on shaft 36, intermeshing with toothed wheel 60 on the cam-shaft, this shaft having bevel-gear connections 61 with a vertical shaft 62, which has miter-geared connections 63 with a cam-shaft 64. The cams on the shaft 64 act upon the usual swinging treadles (indicated at 65) to oscillate them alternately in the usual manner to shift the warp-wires in opposite directions in the usual manner.

The advantages of my invention result from the actuating mechanism for the lay, which delivers a spring-actuated blow, which is easily regulated, and from the means for increasing the frictional resistance of the warp-wires. By this mechanism a harder blow can be struck and a heavier crimp given than formerly and without the usual tendency to stretch these warp-wires. The warp may be under less tension than formerly, while at the same time a heavier blow may be struck.

The automatic stop is of special advantage in preventing injury to the web where the lay cannot be stopped before striking its blow and the loss of time in extracting the defective shoot-wire is saved. The use of the automatic friction-brake enables the operator to give a quick stop in order to prevent the lay starting on its stroke, if possible, where the wire is not inserted properly.

The loom is comparatively simple, the movements are positive, and the operation efficient.

Many variations may be made in the form of the stop mechanism for the lay, the friction devices may be stationary instead of rotary, and many other changes may be made in the form and arrangement of the parts without departing from my invention.

I claim—

1. A wire-loom having a swinging lay and having warp-wires in the form of an endless belt adapted to move under the stroke of the lay, a rock-shaft, link and lever connections between said lay and rock-shaft, cam mechanism for positively rocking the shaft in one direction to draw back the lay, and spring-actuated-lever connections arranged to be extended by the cam and to act by contraction to rock the shaft to drive the lay forward, said cam and spring mechanism being arranged above said endless belt, substantially as described.

2. A wire-loom having warp-wires forming an endless belt, a lay arranged to strike the shoot-wire and move the belt, means for adjusting the tension of the warp, and a friction device bearing upon an intermediate part of the belt, substantially as described.

3. A wire-loom having warp-wires arranged to form an endless belt, a lay arranged to strike the shoot-wire and move the warp-wire belt, a pair of friction devices on one side of the belt, and a friction device on the opposite side and between the first intermediate element, mechanism for moving the one friction device to change the amount of frictional resistance, and means for adjusting the tension of the belt, substantially as described.

4. A wire-loom having warp-wires forming an endless belt, a lay arranged to strike the shoot-wire and move the warp-wire belt, a three-roller friction device arranged to act upon the belt, mechanism for adjusting the position of one of the rollers to change the amount of resistance, and means for adjusting the tension of said belt, substantially as described.

5. A wire-loom having warp-wires arranged in an endless belt, a lay arranged to strike the shoot-wire and move the warp-wire belt, a friction element extending across the belt, adjustable mechanism at each end of the element arranged to force it into contact with the belt and increase the frictional resistance, and means for adjusting the tension of said belt, substantially as described.

6. A wire-loom having a stop, mechanism for normally holding this stop in the path of the lay, and mechanism under the control of the operator for holding the stop out of this path during the normal operation of the loom, substantially as described.

In testimony whereof I have hereunto set my hand.

INOZENS J. NERACHER.

Witnesses:

L. M. REDMAN,

H. M. CORWIN.