

(No Model.)

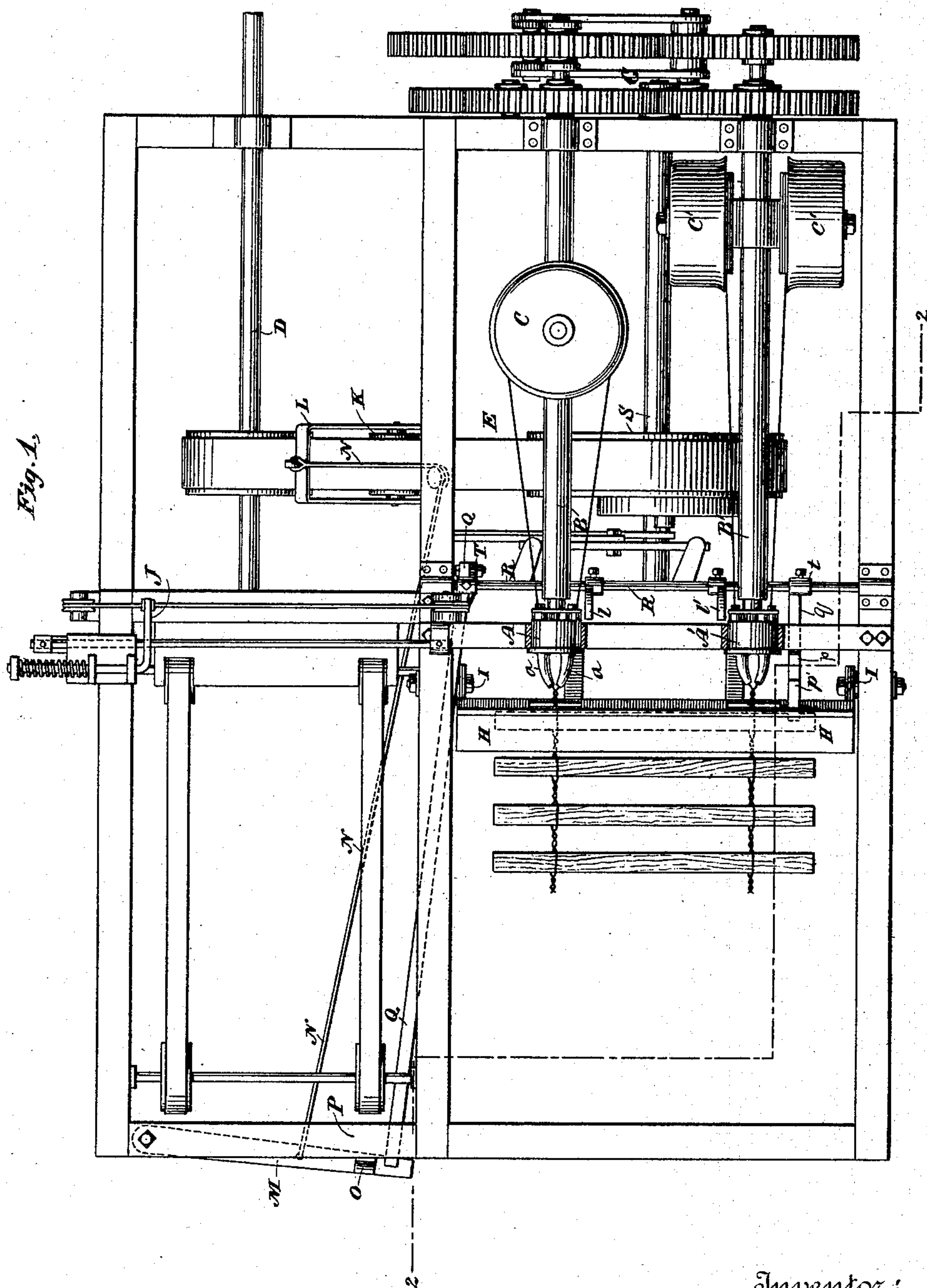
3 Sheets—Sheet 1.

J. ZENGEL.

MACHINE FOR MAKING FENCE.

No. 388,610.

Patented Aug. 28, 1888.



Witnesses.

Geo. W. Bruck.

Robert J. Gayford.

Inventor:

Joseph Zengel.

By his Attorneys

Amesbury Curtis Page

(No Model.)

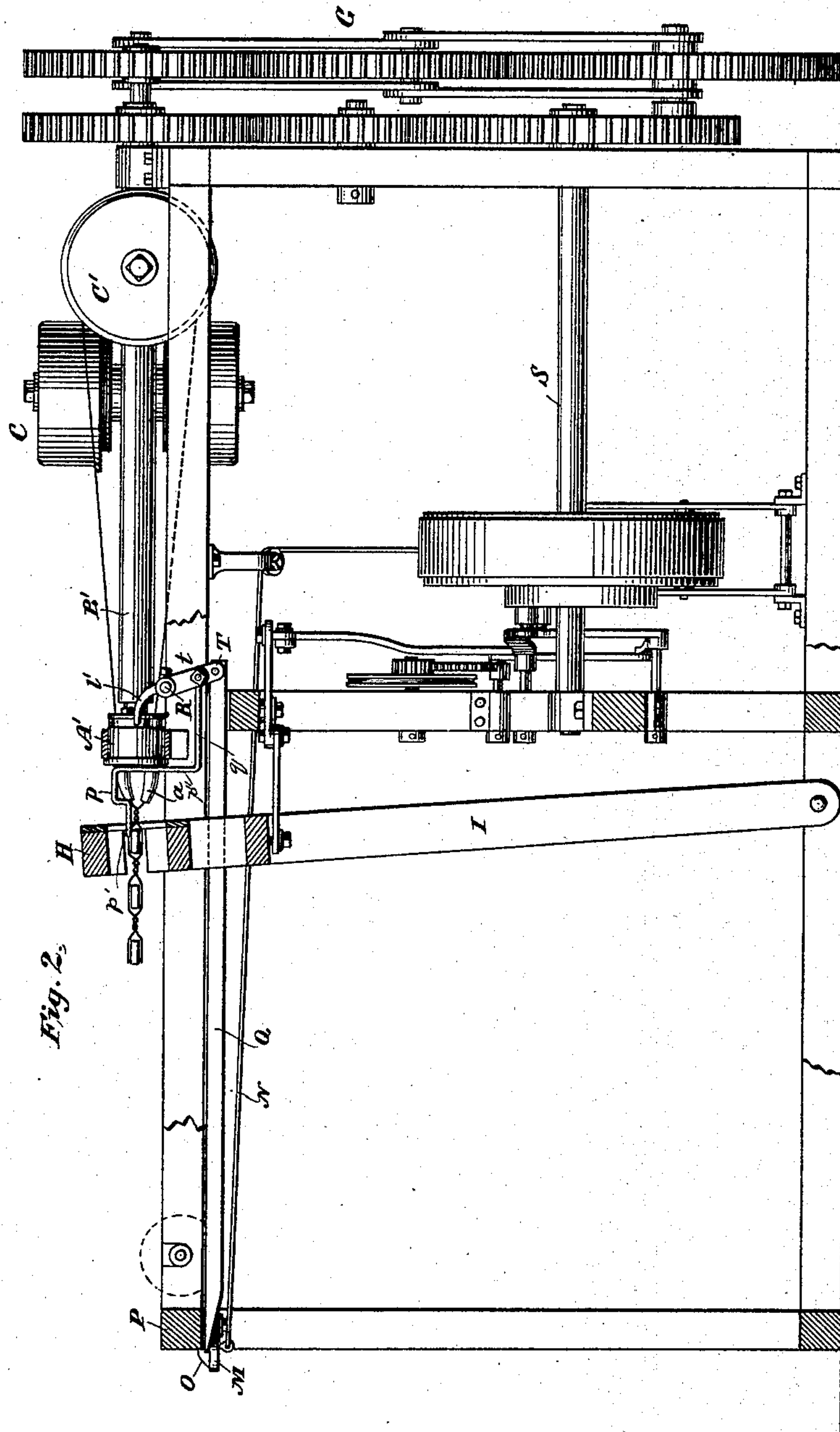
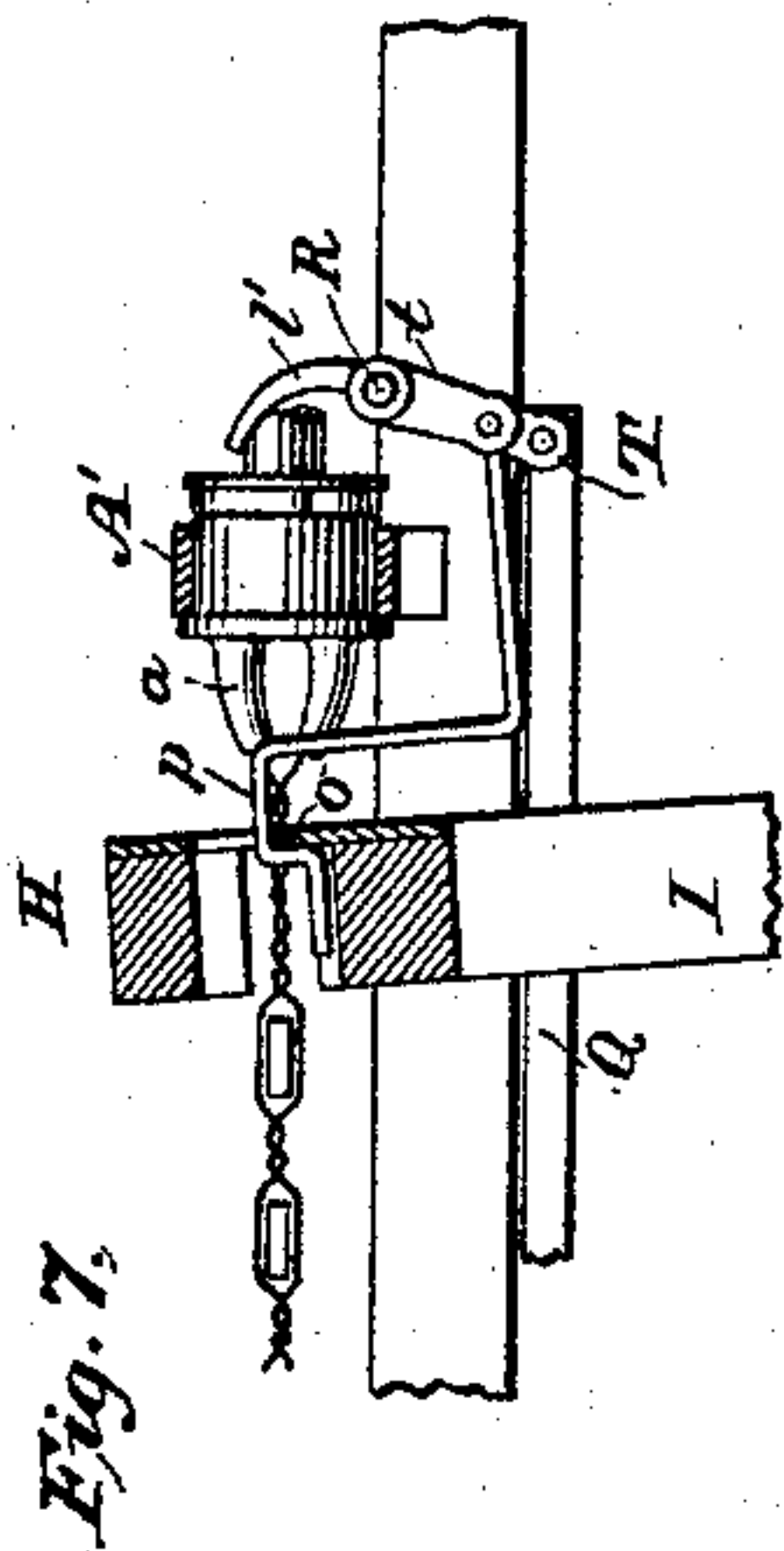
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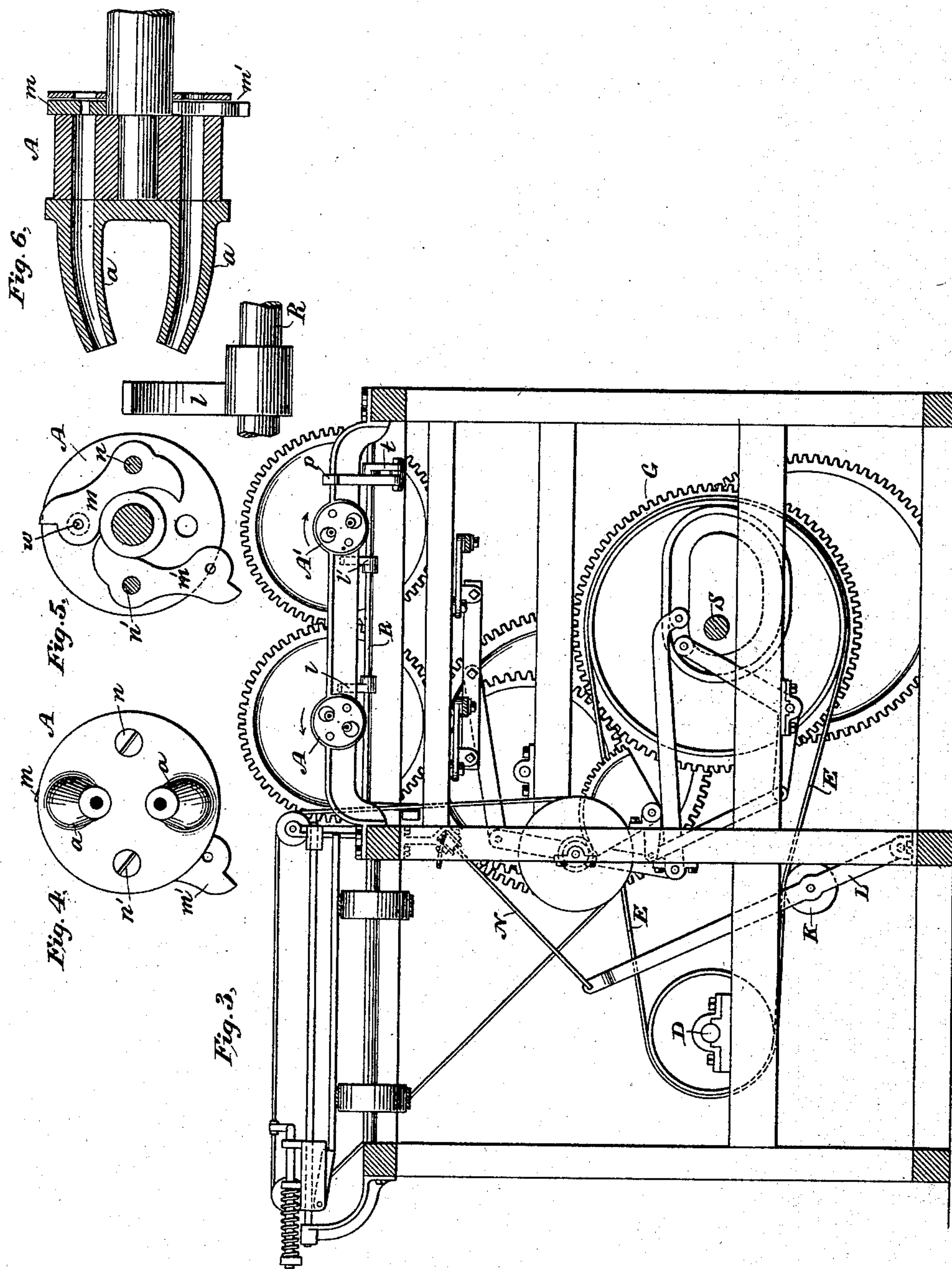
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MACHINE FOR MAKING FENCE.

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Patented Aug. 28, 1888.



Witnesses,
Geo. W. Dwyer
Robert J. Gayford

Inventor,
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By his Attorneys
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UNITED STATES PATENT OFFICE.

JOSEPH ZENGEL, OF QUINCY, ILLINOIS, ASSIGNOR, BY MESNE ASSIGNMENTS,
TO THE AUTOMATIC FENCE LOOM COMPANY, OF NEW JERSEY.

MACHINE FOR MAKING FENCE.

SPECIFICATION forming part of Letters Patent No. 388,610, dated August 28, 1888.

Application filed November 2, 1887. Serial No. 254,085. (No model.)

To all whom it may concern:

Be it known that I, JOSEPH ZENGEL, a citizen of the United States, residing at Quincy, Adams county, in the State of Illinois, have invented certain new and useful Improvements in Machines for Making Fence, of which the following is a specification, reference being had to the accompanying drawings, which form a part hereof.

My invention relates to machines used for making the kind of fence known as "picket-and-wire" fence, which is formed of upright pickets or palings connected by wires arranged horizontally and twisted together between the pickets or palings; and it relates more particularly to such machines of this general class as are designed to be driven continuously by power and to work automatically to perform the various operations necessary for constructing the fence. In such machines as they have hitherto been constructed when either of the wires breaks or becomes exhausted on the reel, or when the picket-feeding device fails to work properly or the attendant neglects to supply pickets, the continued operation of the machine results in a serious fault in the fence, which it is very difficult to undo or repair.

It is the object of my present invention to overcome this defect in the operation of such machines, which has hitherto caused serious inconvenience and annoyance in their use. I accomplish this by combining with the machine an automatic stop mechanism, which is connected with each of the wires and so arranged with reference to the pickets subjected to the action or operation of the machine that it is held in suspense as long as the wires are intact and the supply of pickets properly maintained; but whenever either wire fails or the supply of pickets ceases or becomes irregular, so that they are not presented properly to the operation of the twisting mechanism, the stop mechanism is brought into action and operates to disconnect the driving-power from the machine or otherwise arrest its action.

Various forms of mechanism may be used for carrying out my invention, and the form to be adopted in any given case and the mechanical details of construction will necessarily depend upon the construction in other re-

spects of the particular machine to which it is to be applied.

In the drawings I have shown my invention as applied to a machine of the type invented by me and described in my previous patents, No. 289,490, dated December 4, 1883, and No. 326,007, dated September 8, 1885. In this machine, as is well known, the reels of wire are mounted on hollow shafts which are rotated continuously at uniform speed by power, and the pairs of wires are carried from the reels to twisting-heads which are mounted on shafts passing through the reel-shafts and rotated intermittently in the same direction as the reels, stopping periodically for insertion of pickets, and then moving rapidly enough to overtake the reels. The pickets are automatically fed in between the wires at the proper times while the twisting heads are stopped or are moving slowly. I apply to each of the wires at some place between the reels and the points where the wires are twisted a movable piece—such as a lever or pawl—which is restrained or held by the wire in opposition to gravity or the force of a spring, and so arranged that when it is released from the wire it assumes a new position and engages with an arm or finger on a rock shaft or bar, and by turning or moving it releases a belt-tightener or some similar device controlling the transmission of power to the machine, and so disconnects the machine from the motive power and stops it. I also connect with the rock shaft or bar a movable piece—such as a lever or pawl—resting on and supported by the pickets at some point in their course into or through the machine, and so arranged that when not supported it drops down into engagement with some moving part of the machine and is drawn forward, so as to move the rock shaft or bar and disconnect the motive power.

Figure 1 is a plan of the machine. Fig. 2 is a side elevation, partly in section. Fig. 3 is an end elevation, and Figs. 4, 5, 6, and 7 are details of the automatic stop mechanism.

The twisting-heads A A' are mounted upon the ends of longitudinal shafts, surrounding which are the sleeves B B', carrying the reels of wire, C C and C' C'.

S is the main shaft of the machine, to which power is transmitted from the counter-shaft D by means of the belt E. A continuous movement is imparted from the main shaft to the sleeves B B' and an intermittent movement in the same direction to the twisting-heads A A' by means of suitable gearing, G, as set forth in my previous patents. I have shown only two sets of twist-ers and reels; but in practice any desired number may be used.

H is the guideway for the pickets as they are fed into the machine. This is shown as mounted on pivoted standards I, and, as set forth in my previous patents, a lateral reciprocating movement is imparted to it, so as to carry the picket forward laterally after it has been fed in between the wires; but instead of using the guideway itself for this purpose separate arms or heads may be used for advancing the picket laterally, and the guideway may be stationary.

J is the automatic picket-feeding device, constructed, preferably, as set forth in my patent, No. 326,007, above referred to, which at every revolution of the main shaft drives a picket longitudinally into the guideway H and between the horns *a a* of the twisting-heads while the latter are at rest or are moving slowly.

I have shown the transmission of power to the main shaft as controlled by means of a belt-tightener consisting of an idle-pulley, K, running on the main belt, which is sufficiently slack not to run the machine when the idler does not bear upon it. The idle-pulley is mounted in a pivoted frame, L, the position of which is controlled by the lever-cord N and lever M; but a friction-clutch or any other suitable device may obviously be used for this purpose.

When the machine is in operation, the lever M is held in position by the detent O, affixed to it, which engages with the frame P of the machine. The lever is unlocked by depressing it until the detent clears the frame. The lever M is depressed automatically by means of the pointed bar Q and the rock-shaft R, the rear end of the bar being pivoted to a short arm, T, on the rock-shaft.

The mechanism for operating the rock-shaft and arresting the movement of the machine upon a failure or irregularity in the supply of pickets is best shown in Figs. 2 and 7. It consists, in general terms, of a movable piece (which is here shown in the form of a lever or pawl) pivoted with its free end in the path of movement of the pickets at a given point of their course through the machine. The device which I have shown for this purpose is a bent lever pivoted to an arm, *t*, on the rock-shaft. This lever has a horizontal part, *q*, which is pivoted to the arm *t*, and a central elbow or bent portion, *p*, one side, *p'*, of which is longer than the other. The end *p'* is straight or horizontal, and is designed to rest upon the pickets. In the position shown in Fig. 2 the lever clears the guideway by reason of its conforma-

tion and of its resting on a picket; but should a picket fail the lever, being no longer supported, drops down into the position shown in Fig. 7, and, offset *o* engaging with the guideway, the lever is drawn forward by the next forward movement of the guideway. The rock-shaft is turned, and the lever M is unlocked by the insertion of the pointed bar Q between it and the frame T. The forward end, *p'*, of the lever or pawl is made a little longer than the space between the pickets, so that it is supported by one picket until the next succeeding picket comes under the end *p'*. I prefer to apply it near the forward ends of the pickets, as shown in Fig. 1, so that it will be called into operation in case the picket is not driven far enough by the picket-feeding mechanism, or in case a picket rebounds after having been driven in.

It is obvious that the mechanical details of this device may be varied to suit the construction of different machines, the essential principle being that the transmission of power to the machine is controlled by a movable piece in the path of movement of the pickets, which is held out of action by the pickets as long as they are properly supplied and carried through the machine.

Movement is imparted to the rock-shaft upon the breaking or running out of either of the wires by means of the levers or pawls *m m'* acting upon the arms or fingers *l l'*. The arms *l l'* are attached to the rock-shaft in such a position that their outer ends are alongside of and just clear the rear ends of the twisting-heads. Two short levers or pawls, *m m'*, are attached to the rear end of each twisting head—one for each of the wires. These are pivoted at *n n'* and have holes *w w'* in their outer ends through which the wires from the reels pass and hold them in toward the center, as shown at *m*, so that they clear the fingers *l l'* as long as the wires are intact; but when a wire breaks or runs out the corresponding lever or pawl drops down into the position shown at *m'*, and by engaging with and lifting one of the fingers turns the rock-shaft, which drives the bar Q forward, releases the belt tightener, and stops the machine.

It is obvious that the pieces *m m'* may be arranged to slide in and out, instead of turning on a pivot, as shown, and they may be applied to the wires at any point between the reels and the points where the wires are twisted. In machines where the reels are not moved, as in some forms of reversible twist-machines, they need not be carried by a moving part of the machine. It is obvious that the same result may be accomplished by making the levers or pawls when released from the wires act upon the device controlling the transmission of power in a variety of ways involving the same general principle of operation, and I do not consider my invention as limited to the precise form of mechanism I have shown.

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

1. In a fence-machine, the combination, with the twisters, of a belt-tightener or equivalent device for governing the transmission of power to the machine, levers or pawls for controlling the operation of the same, arranged to be held out of action by the wires leading from the reels to the points of twisting, and a device or devices connecting the levers or pawls with the belt-tightener or its equivalent, whereby the machine is automatically stopped whenever either of the wires breaks or runs out, substantially as described.

2. In a fence-machine, the combination, with the twisters, of a belt-tightener or equivalent device for governing the transmission of power to the machine, stop mechanism for controlling the operation of the same, and levers or pawls normally sustained or supported, respectively, by the wires leading from the reels to the point of twisting and by the pickets in their passage through the machine, and adapted when released or dropped by the failure of either a wire or wires or of the proper supply of pickets to bring the stop mechanism into action, as set forth.

3. In a fence-machine, the combination, with the twisters, of a belt-tightener or equivalent device for governing the transmission of power to the machine, a rock-shaft or bar operating or controlling the same, and levers or pawls for controlling the operation of the rock-shaft or bar, the said levers or pawls being normally sustained or supported by the wires and pickets, respectively, and adapted by their release to set in operation the rock-shaft, and thereby disconnect the motive power, substantially as set forth.

4. The combination, in a fence-machine, of levers or pawls carried by the twisting-heads or their shafts and arranged to be normally restrained against the force of gravity or a spring by the wires passing from the reels to the twisters, a rock-shaft or bar provided with fingers or arms, with which the levers or pawls engage when released, and a belt-tightener or

equivalent device operated by the rock-shaft for controlling the transmission of power to the machine, substantially as described.

5. The combination, in a fence-machine, of an automatic picket-feeding device with a movable piece located in the path of movement of the pickets that are fed into the machine and restrained by them as they successively pass through and from the twisters, a belt-tightener or equivalent device for governing the transmission of power to the machine, and intermediate mechanism for causing the release of the movable piece to act upon the belt-tightener, whereby the machine is stopped automatically when the proper supply of pickets fails, substantially as described.

6. The combination, in a fence-machine, of a pawl or lever supported by the forward ends of the pickets in their progress through and from the wire-twisters with stop mechanism adapted to be operated by the release of the pawl when not supported by the pickets, substantially as set forth.

7. The combination, with the automatic picket-feeding device and the reciprocating guideway or pushing-head, of a pawl or lever adapted to engage with the guideway or head when not supported by the pickets and a power-detaching device brought into operation by the pawl or lever when moved by the guideway, substantially as described.

8. The combination, in a fence-machine, of the pawls *m m'*, the rock-shaft *R*, provided with the arms *l l'*, and the belt-tightener operated by the rock-shaft, substantially as described.

In witness whereof I have signed this specification, in the presence of two witnesses, at the city of Quincy, Illinois, this 26th day of October, 1887.

JOSEPH ZENGEL.

Witnesses:

JOHN H. WILLIAMS,
GEORGE A. BINKERT.