No. 700,710. Patented May 20, 1902.

F. STEBLER.

WOVEN WIRE FENCE MACHINE.

(Application filed Aug. 28, 1901.)

(No Model.) 5 Sheets—Sheet 1.

Fig. 1.

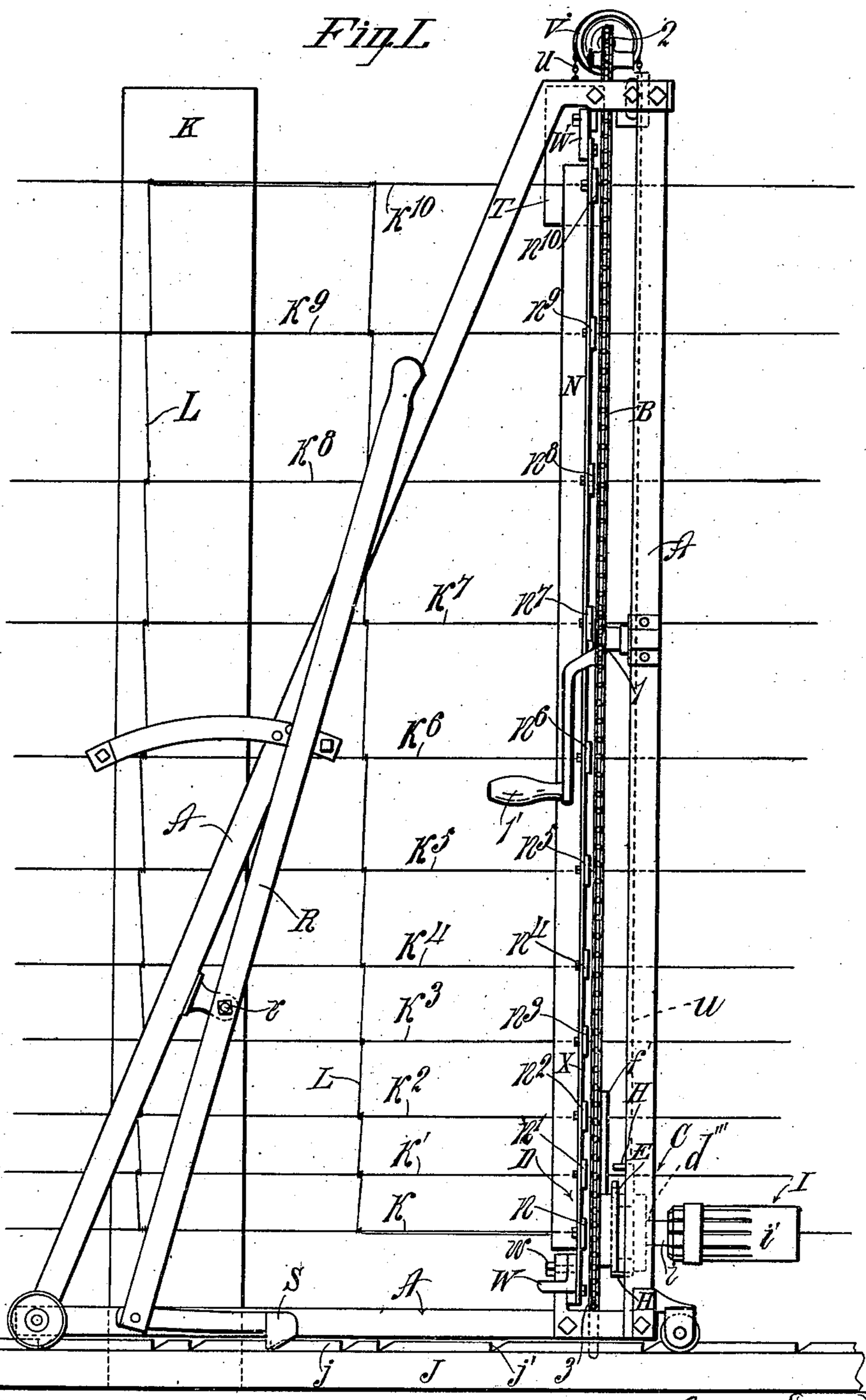

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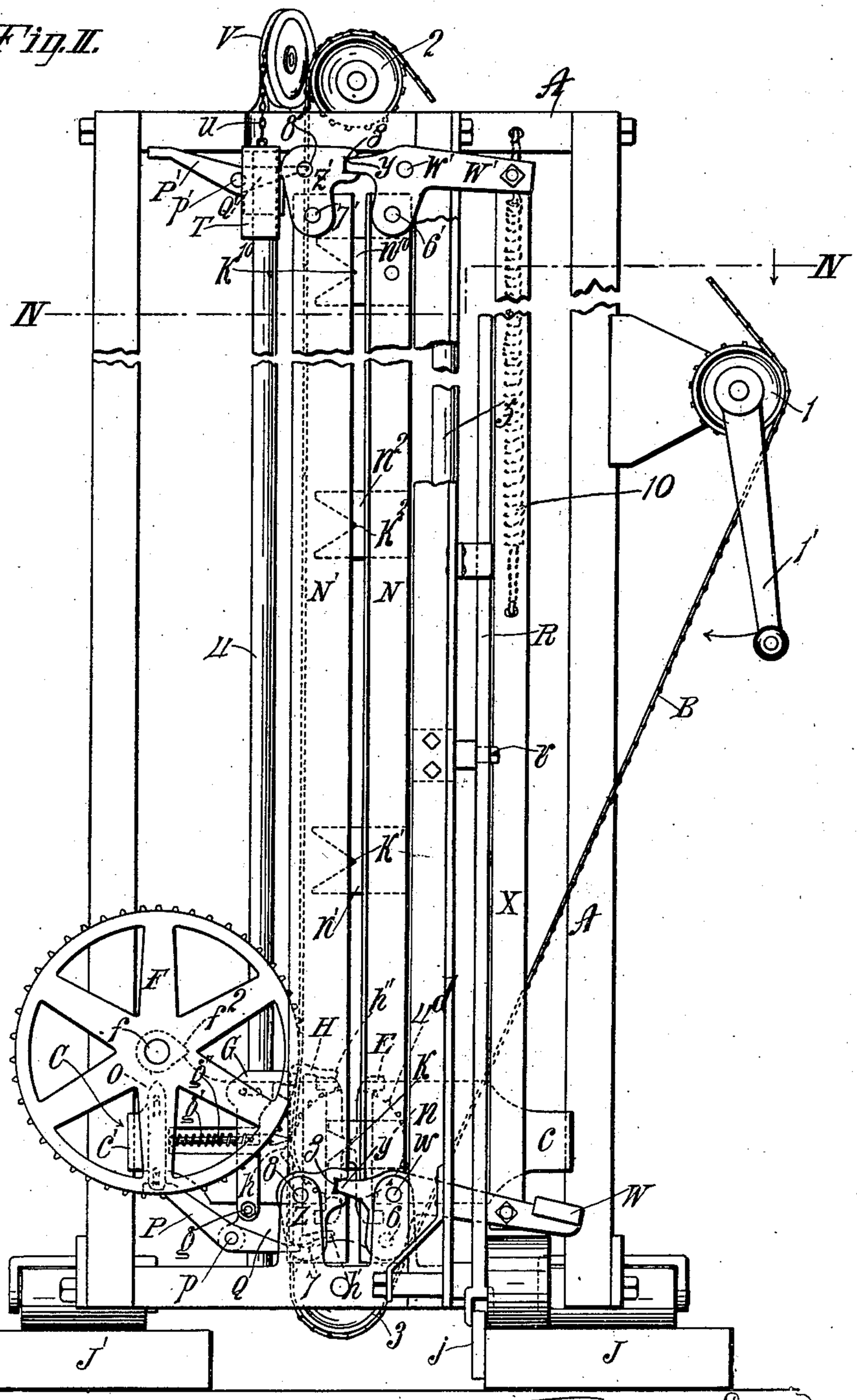
Fig. II.



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(No Model.) 5 Sheets—Sheet 3.

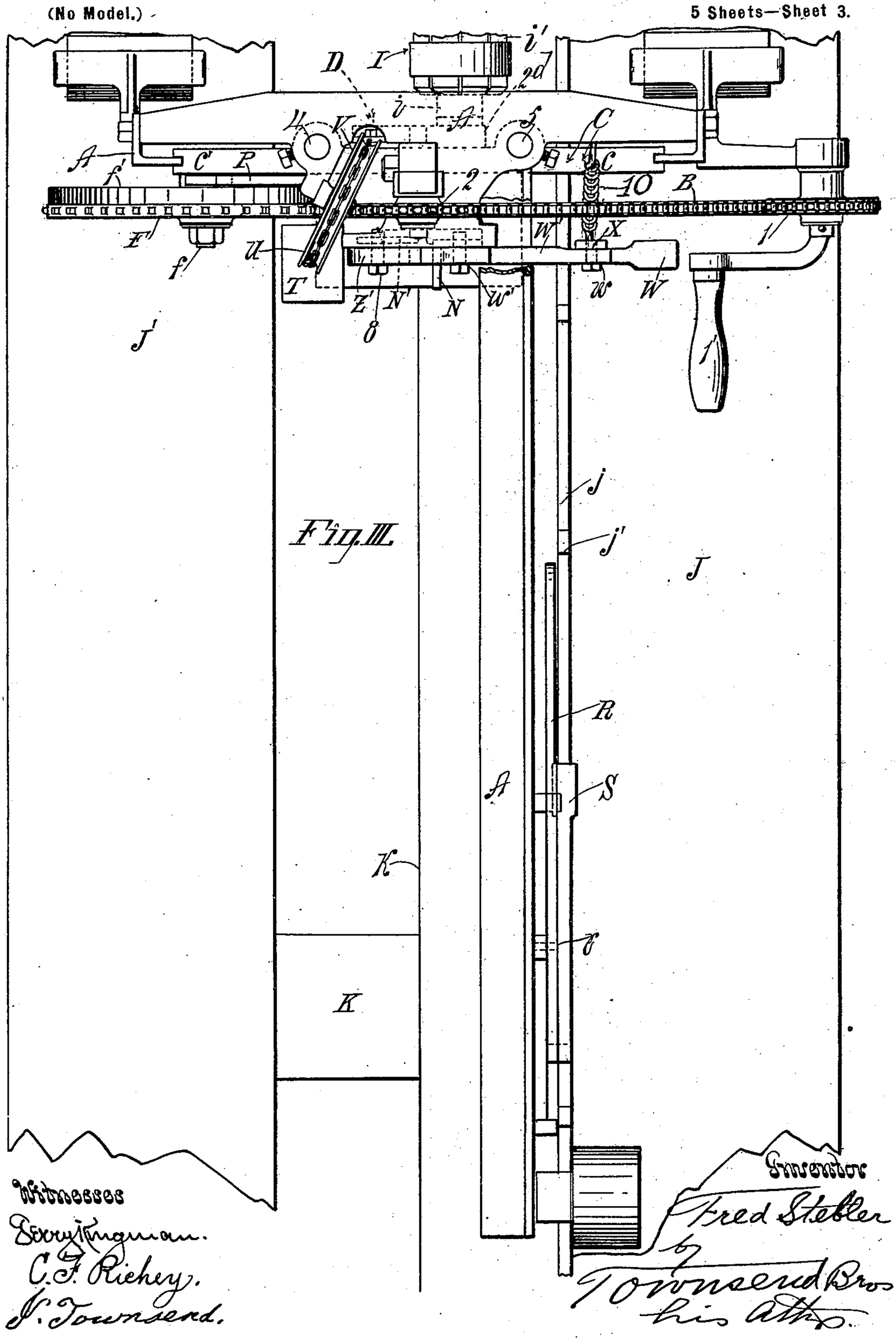

Fig. III.

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No. 700,710. Patented May 20, 1902.

F. STEBLER.

WOVEN WIRE FENCE MACHINE.

(Application filed Aug. 28, 1901.)

(No Model.) 5 Sheets—Sheet 4.

Fig. IV.

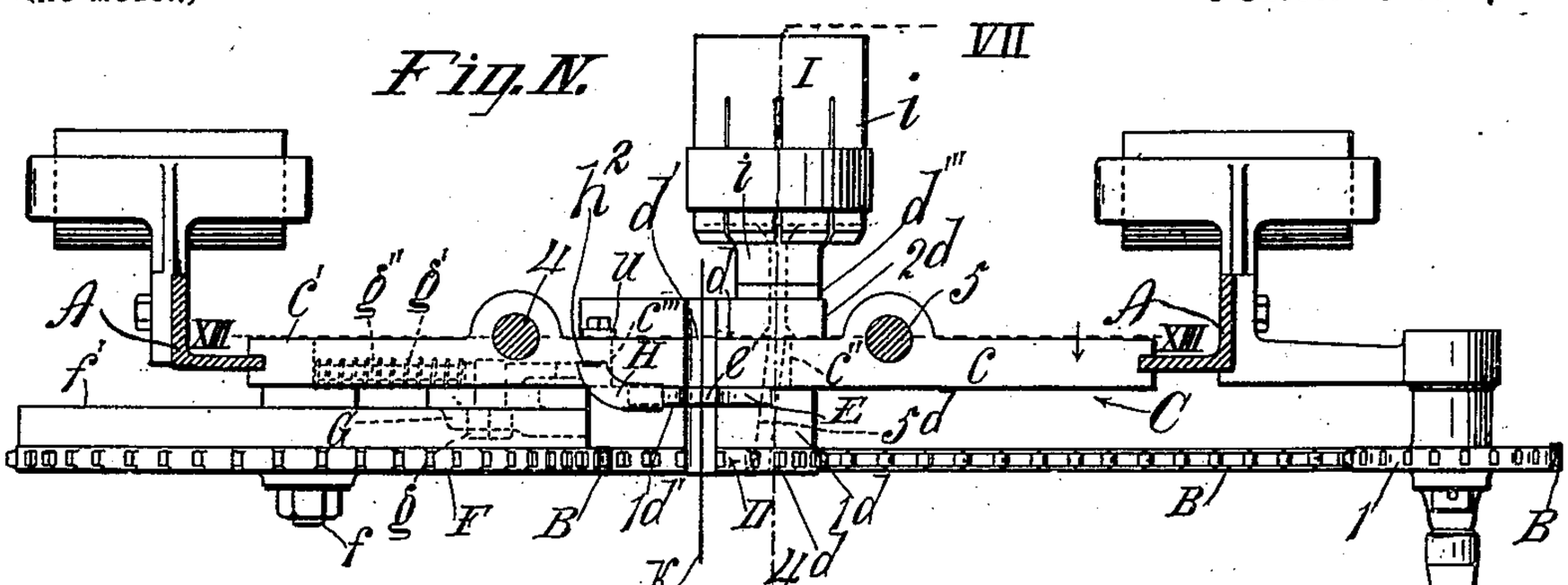


Fig. V.

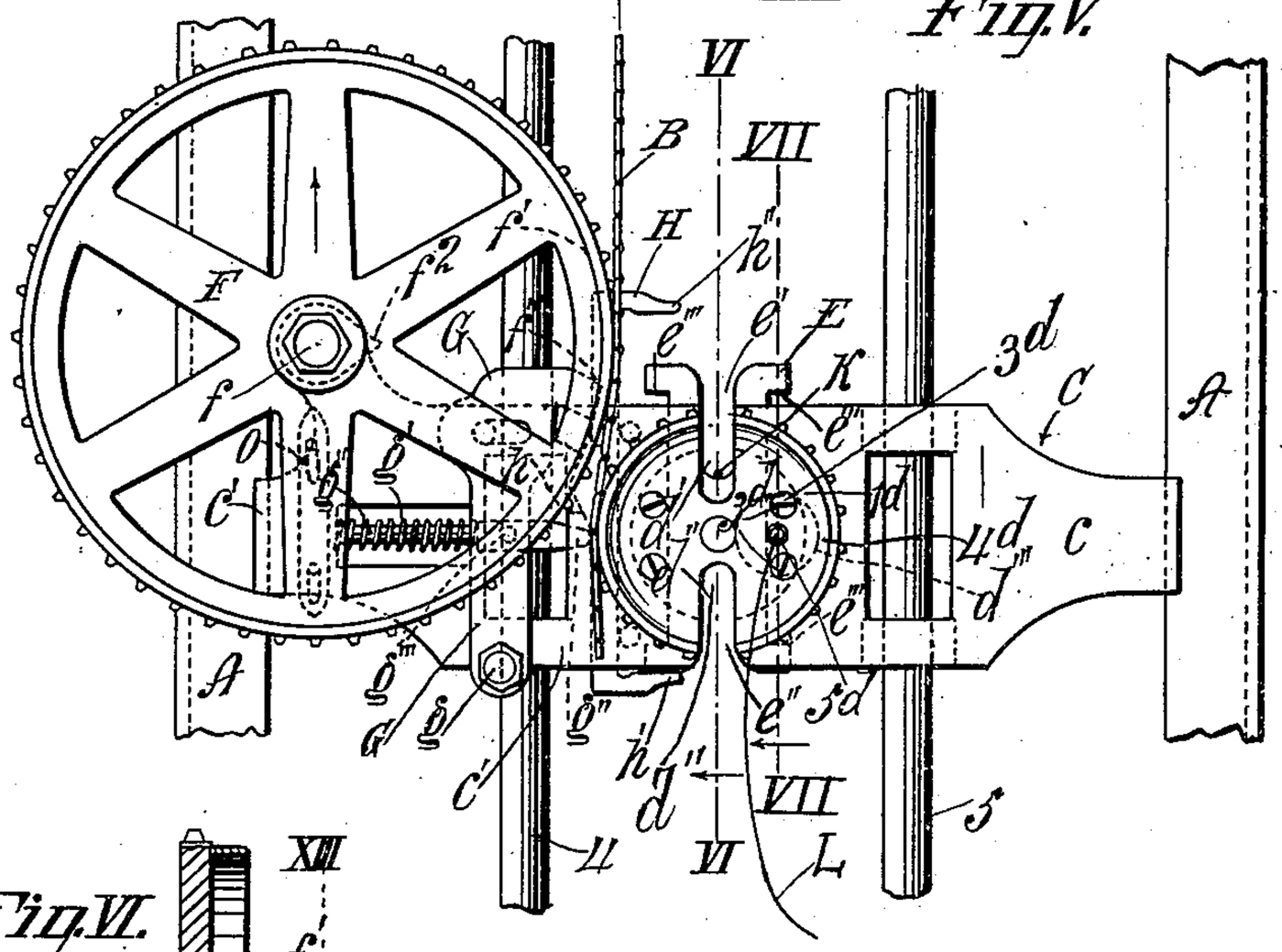


Fig. VI.

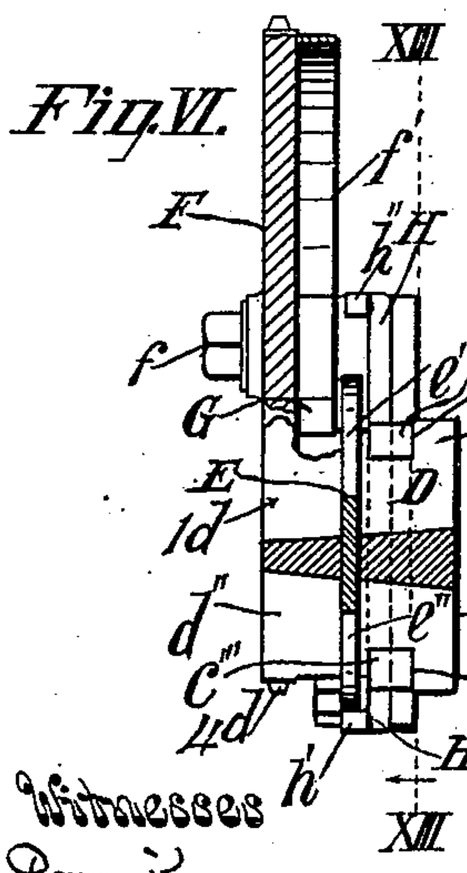
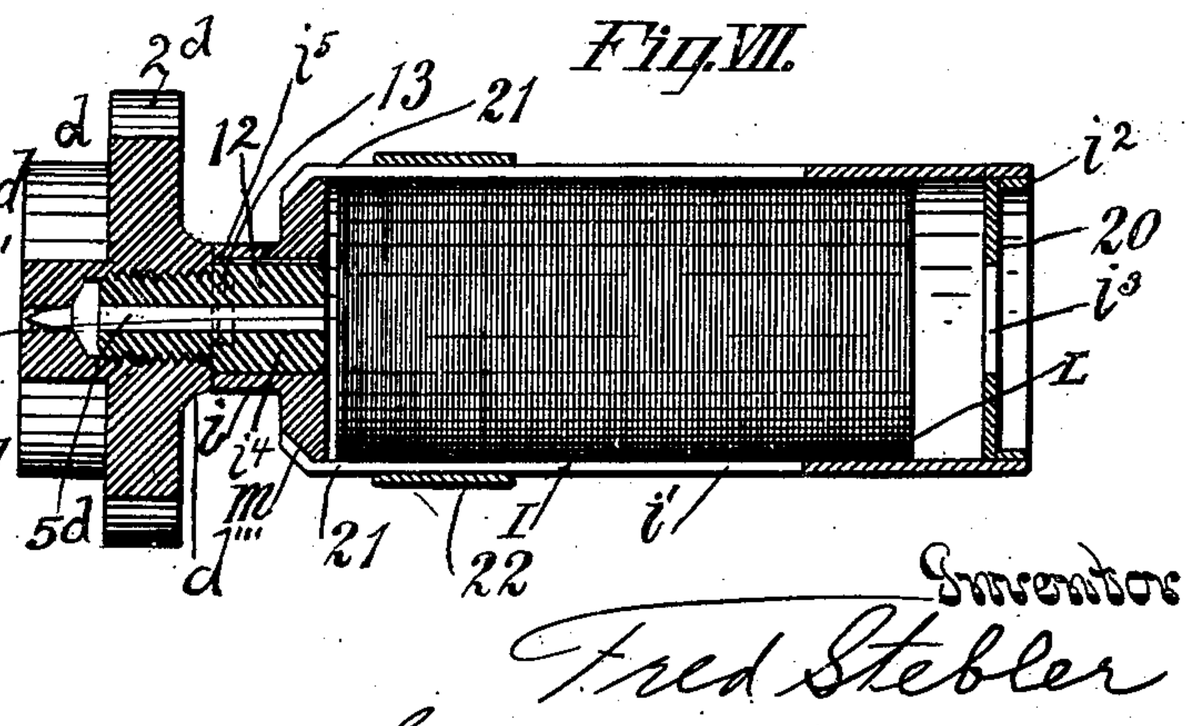


Fig. VII.



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No. 700,710. Patented May 20, 1902.

F. STEBLER.

WOVEN WIRE FENCE MACHINE.

(Application filed Aug. 28, 1901.)

(No Model.) 5 Sheets—Sheet 5.

Fig. VIII.

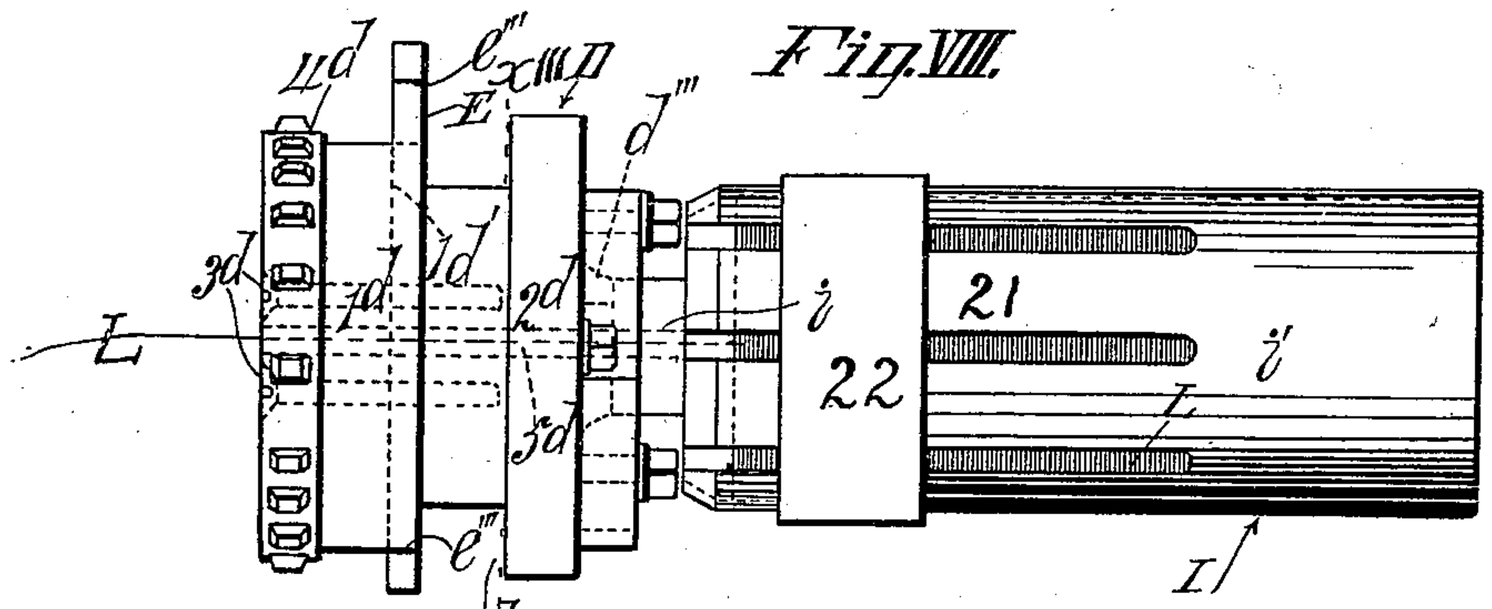


Fig. IX.

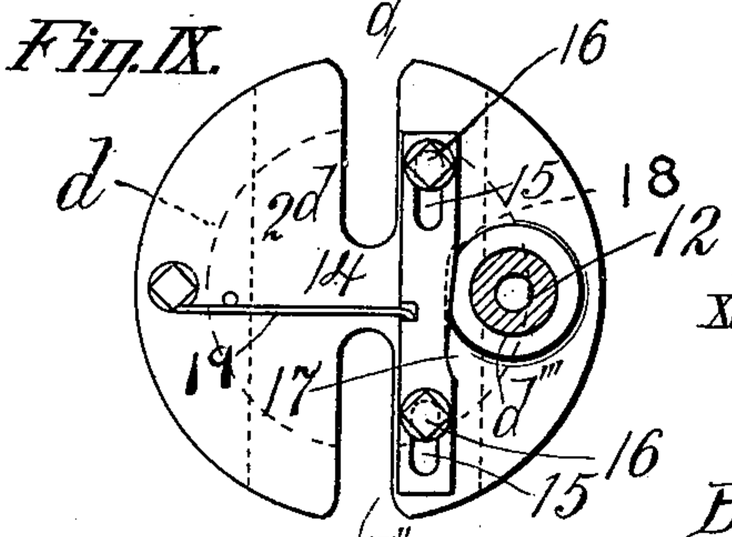


Fig. X.

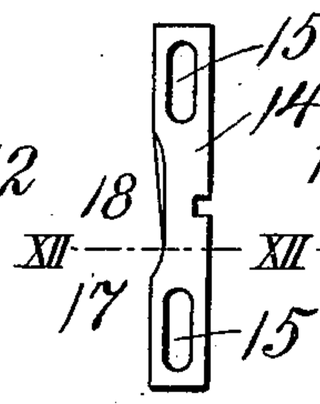


Fig. XI.

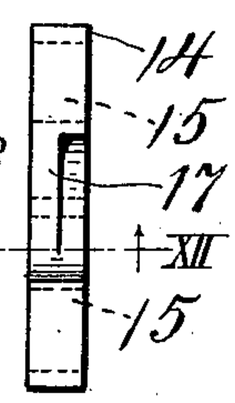


Fig. XII.

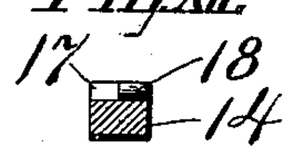
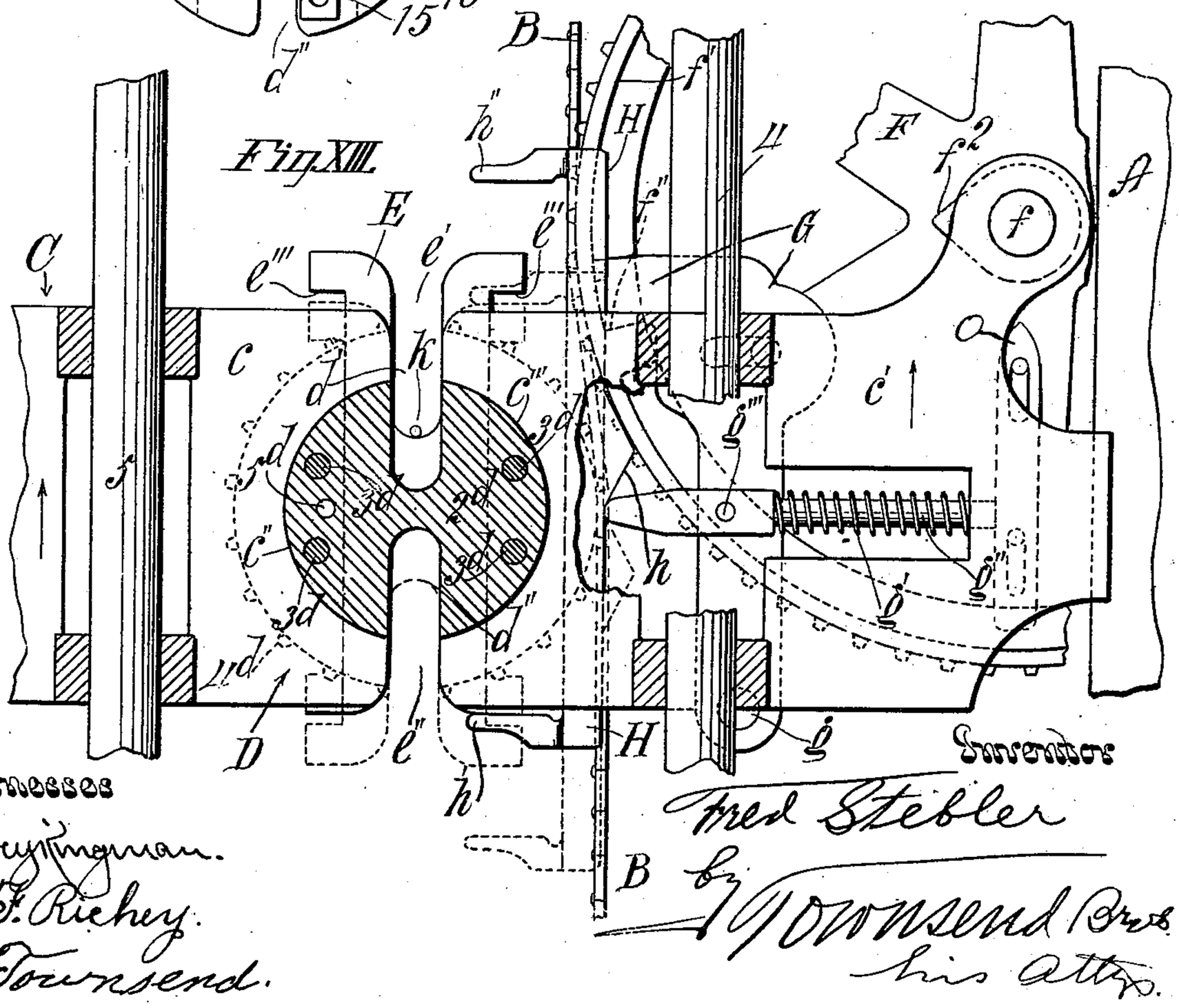


Fig. XIII.



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UNITED STATES PATENT OFFICE.

FRED STEBLER, OF RIVERSIDE, CALIFORNIA.

WOVEN-WIRE-FENCE MACHINE.

SPECIFICATION forming part of Letters Patent No. 700,710, dated May 20, 1902.

Application filed August 28, 1901. Serial No. 73,617. (No model.)

To all whom it may concern:

Be it known that I, FRED STEBLER, residing at Riverside, in the county of Riverside and State of California, have invented a new and useful Woven-Wire-Fence Machine, of which the following is a specification.

An object of my invention is to provide a wire-fence machine by which the processes requiring attention on the part of the operator will be reduced to a minimum. This is accomplished by providing the machine with means for moving the twister-head vertically and automatically rotating it periodically during its vertical movement and by also producing automatic means for locking said head against rotation while it is being carried between the wires. I provide a practically automatic machine which will rapidly twist vertical wires upon the horizontal wires of the fence, thereby to produce a woven-wire fence with less expenditure of time and labor than with machines heretofore known.

An object of my invention is to produce a machine of this kind which is not liable to get out of order or become broken.

Another object of my invention is to provide for accurately spacing the distance between the vertical wires.

Another object of my invention is to provide for compactness, durability, and strength.

The accompanying drawings illustrate my invention.

Figure I is a side elevation of my newly-invented fence-weaving machine in position for operation. Fig. II is a rear view of the machine in operation. Fig. III is a plan of the machine in operation. Fig. IV is a plan viewed from line IV IV, Fig. II, omitting the strand-clamping bars N N′ and their connections. Fig. V is a detail elevation of the traveling twisting device, the rotary twister, with its wire-holder, being removed. Fig. VI is a view, partly in section, on line VI VI, Fig. V. A portion of the sprocket-wheel F is broken to expose the sprocket-wheel-locking pawl G. Fig. VII is a sectional detail on line VII VII, Fig. V, showing the wire-holder with wire therein for forming the vertical stays. Fig. VIII is an elevation of the side of the twister with wire-holder attached. Fig. IX is an end view of the wire-holder-holding member of the twister without the spool. The wire-holder-holding pin is shown in section. Fig. X is a detached view of the sliding catch for holding the wire-holder on the twister. This view shows the side of the catch opposite that shown in Fig. IX. Fig. XI shows the same viewed from the right in Fig. IX. Fig. XII is a section of said catch on line XII XII looking up in Fig. XI. Fig. XIII is an enlarged fragmental detail of the sprocket-wheel F and its locking-pawl G, seated in its pawl-seat *f″*. The twister and its carrier are shown in section on line XIII XIII, Fig. IV.

In carrying out my invention I employ a carrier which is adapted to be rolled along a temporary track placed in line with the horizontal strands of the fence to be built. The carriage is provided with upright guides, and a twister-carrier is arranged to move up and down on said guides, and a twister carried by said carrier is provided and is supplied with a wire-holder for carrying the wire which is to form the vertical stays, and said twister is constructed in two parts which rotate and carry the stay-wire around the strand about which it is to be twisted.

A indicates a carriage of suitable form provided with a driving sprocket-wheel 1 and sprocket-chain-carrying wheels 2 and 3, around which a sprocket-chain B is trained.

C indicates a twister-carrier consisting of two members *c c′*, mounted upon guides 4 5, and provided in their adjacent ends with bearings *c″* and *c‴*, respectively.

D indicates a rotary twister provided with an annular groove *d*, into which the bearings *c″ c‴* seat to clasp the twister and hold it in the traveling carriage and also furnished with two oppositely-arranged longitudinal grooves *d′ d″*.

E indicates a slide arranged diametrically across the twister and provided with two recesses *e′ e″* to register, respectively, with the longitudinal grooves *d′ d″* of the rotary twister. The slide E is provided at its ends with shoulders *e‴*, which limit its movement in the rotary twister. In order to mount the slide E in the twister, the twister is formed of two pieces 1^d 2^d, which are fastened together with screws 3^d. The member 1^d is provided with a slideway $1^{d'}$ to receive the slide E.

F indicates a sprocket-wheel journaled at *f* to the member *c′* of the twister-carrier.

The sprocket-wheel is provided with an annular pawl-track f', having a pawl-seat f''' therein.

G indicates a pawl to ride upon the pawl-track f' and to seat in the pawl-seat f'''. The pawl G is pivoted at g to the member c' of the twister-carriage and is spring-pressed against the pawl-track by a spring g'.

g'' indicates a pin or bolt carried by pawl G and extending into the path of a pawl-operating slide H, provided with a cam h to engage the pawl-pin g'' to actuate the same. The pawl-pin g'' is pivoted to the pawl G by a pivot g''' to throw the pawl G out of the seat f'''. The opposite ends of the pawl-operating slide H are provided with fingers h' h'', which are respectively brought into the path of the twister-slide E as the pawl-slide H stands at one or the other of the opposite limits of its movement, as the case may be, in the practical operation of the machine.

I indicates the wire-holder, which is fastened to a boss d''' on the member 2^d of the twister. The member 1^d of the twister is provided with a sprocket-wheel 4^d, which meshes with the sprocket-chain B. The sprocket-chain B also meshes with the sprocket-wheel F, so that both the sprocket-wheels F and 4^d are simultaneously driven by the sprocket-chain when the same is driven and the sprocket-wheel F is free to revolve. The sprocket-wheel F has two and one-half times as many teeth as the twister sprocket-wheel 4^d, so that when the sprocket-wheel F has made one revolution the twister sprocket-wheel 4^d will have made two and one-half revolutions. It is thus seen that at every revolution of the sprocket-wheel F the grooves d' d'' will have exchanged positions—that is to say, at the position shown in Fig. V the groove d' of the twister is uppermost; but upon a complete revolution of the sprocket-wheel F the sprocket-wheel D will have made two and one-half revolutions and the groove d' will be underneath and the groove d'' will be uppermost.

J J' indicate two track members which preferably consist of two planks, say, about eight inches wide and sixteen feet long, more or less. Upon one of these track members a ratchet-bar j, with notches j', is fastened, the notches being located at distances apart to provide for moving the machine the distances desired between the vertical wires which are to be woven in the fence.

K indicates a fence-post, and k indicates the horizontal strands, to be fastened to the fence-post when the weaving has been completed.

L indicates the vertical stays or cross-wires.

The wire L is held in a holder I, which is carried by the rotary twister, and consists of a hub i, which is detachably attached to the eccentrically-located hub or boss d''' of the portion 2^d of the rotary twister, and a case i', which is detachably fastened to the hub i. The wire is contained within the case i', and one end of the wire passes through the hub i and boss d''' and through a hole 5^d in the twister sprocket-wheel 4^d and which hole slants toward the axis of rotation of the twister sprocket-wheel 4^d.

N N' indicate two strand-clamping bars which are operated by suitable means to be thrown toward and from each other to clamp and release the strands k.

n n' n^2 n^3 n^4 n^5 n^6 n^7 n^8 n^9 n^{10} indicate notched bits provided on the clamp-bar N at intervals to receive the strands into their respective notches, so that when the strands are clamped by the bars N N' they are held against vertical displacement.

In practical operation the machine will be placed in position alongside the strands of the fence which have been stretched, and the rotary twister is then brought into position to clasp one of the strands, either the top one or the bottom one, as the case may be. For convenience of description we will assume that the machine has been placed in the position shown in Fig. I and further indicated in Figs. V and XIII, the pawl G being in place in the pawl-seat f''', so that the sprocket-wheel F is locked. It will be seen that when the sprocket-wheel F is thus locked the rotary twister D is also locked, since its teeth engage the sprocket-chain, which is held from movement by the teeth of the sprocket-wheel F. When the twister-frame has been brought under the strand k of the fence, the crank $1'$ of the driving-wheel 1 will be turned in the direction indicated by the arrow in Fig. II. This will draw the chain B to lift upon the sprocket-wheel F, which is locked against rotation, and will lift said sprocket-wheel and the carrier C, to which it is attached. The slide E will engage the strand k, and said strand being held by the bit n in turn holds the slide E from moving up with the carrier C. As the carrier C moves upward, the slide E being thus held forms a stop for the finger h' of the cam-slide H, and thus holds said slide from moving upward, so that as the carriage moves upward the pin g'' of the pawl G will engage the cam h and will thereby be thrown backward against the pressure of the spring g', thus withdrawing the pawl G from the seat f''' in the sprocket-wheel F, thereby releasing said sprocket-wheel and allowing the same to stop moving upward and to rotate instead for one full rotation, thereby rotating the sprocket-wheel 4^d of the rotary twister, and thereby rotating the rotary twister two and one-half times, as hereinbefore stated, until the pawl-seat f''' again comes into position to receive the pawl G, when the pawl G seats in said seat f''', thus locking the wheel F and the rotary twister D, so that the further movement of the sprocket-chain will again carry the carrier up until the slide engages the next wire strand k'. This is made possible for the reason that the rotary twister, having stopped

after having made exactly two and one-half revolutions, stands with the openings e' and d' underneath, thus to release strand k, and the openings d'' e'' uppermost, ready to receive the strand k' next above. It is also to be observed that by this operation the slide E had been left in position, with the bottom of the recess e'' above the bottom of the recess d'', the positions of the recesses d'' and e'' being relatively the same as that shown in Fig. V with relation to e' and d'. When the carriage is moved upward far enough to bring the next strand k' into engagement with the bottom of the recess e'', the slide E is again shifted, and the operation just described is repeated, and this operation is repeated from strand to strand until the border-wire is reached. The slide H is fitted in a slideway h^2 in the member c' of the carrier, and when the strand k of the fence holds the slide E from rising and the carrier members c c' move upward the carrier member c' slides upward along the slide H and carries the pin g'' up the cam h, thereby forcing the pin g'' backward and retracting the pawl G from the seat f'' therefor in the sprocket-wheel F. The distance the carrier C can move upward before the strand k comes into contact with the member 2^d of the twister is not sufficient to carry the pin g'' upward to the middle of the cam h, so that the cam h remains above the pin g'' throughout the entire upward movement of the carrier and will operate the pin g'' to throw the pawl G at every strand of the wire which is encountered by the slide E in the manner hereinbefore described.

It is necessary that on the downward movement of the carrier the pin g'' and its pawl G shall be operated by the downward movement of the carrier in the same way as that just described, and this necessitates the shifting of the slide H into position to bring the cam h below the pin g''.

I will now describe the means for shifting the slide H to bring the cam h into appropriate position relative to the pin g'' at the upper and lower limits of the movement of the carrier. At the upper limit of the carrier movement the slide H must be shifted downward, and at the lower limit of the carrier movement the slide H must be shifted upward.

f^2 indicates a cam on the hub of the sprocket-wheel F.

O indicates a slide mounted on the carrier-member C′ to slide vertically.

P and P′ indicate two shifting-levers to respectively shift the slide H at the upper and lower limits of the movement of the carrier to shift the cam h from the upper to the lower side of the pin g'', and vice versa, for the purpose of reversing the action of the cam h upon the pawl-pin g'', so that the cam will throw the pin appropriately in both the upward and the downward movements of the carrier. The shifting-levers are pivoted by pivots p and p', respectively, to brackets Q and Q′, which are adjustably clamped to the guide 4 and can be shifted on said guide to the respective levels of the top and bottom wires of the fence to be built, thus adapting the machine for constructing fences of different heights of top and bottom wires. The levers P and P′ are each to be actuated by the cam f^2 and are mounted in position to throw the slide H, at the close of both the movements of the carrier, up and down.

In practical operation when the carrier has begun to twist the vertical wire L about the top wire k^{10} the cam f^2 will engage the lever P′ and will throw it to strike upon the upper end of the slide H, and thus throw said slide downward until the point of the cam h passes the point of the pawl-pin g''. After the vertical wire has then been twisted about the top wire the workman will move the machine along the strands, at the same time continuing the operation of twisting, more or less, so that wire L will be twisted more or less along the top strand to the point at which the next vertical wire is to be located. Then the movement of the machine along the strands is stopped and the wire L is given one full twist in the same direction while the machine is standing. Then the workman will reverse the crank 1′, thus reversing the movement of the sprocket-chain B and causing the carrier to descend while the parts move in a direction reverse to that in which they moved while the carrier was going up, the operation being substantially the same as that first described.

In order that the workman can accurately space the vertical wires, a lever R is pivoted by a pivot r to the frame A and is provided at its lower end with a dog S to catch in the notches of the ratchet-bar j, thereby to move the carriage a determined distance. These notches are proportionately arranged for various spacing of vertical wires and the workman will use the lever for appropriately moving the machine at the operation of twisting the wire about the top and bottom strands.

When the carrier is at the lowest strand, the lever P will be operated by the cam f^2 substantially in the manner above described with relation to lever P′, except that the slide O communicates the motion from the cam to lever P. This is necessary for the reason that the lower end of the slide H is considerably below the level of cam f^2.

T indicates a counterweight to counterbalance the carrier and its mechanism.

u indicates a flexible connection fastened to the counterweight and led over a pulley V and connected with the carrier C.

W indicates a bent foot-lever for simultaneously operating the clamp-bars N and N′. Said lever is pivoted to the frame A at w and is connected by a link X with lever W′, which is pivoted by pivot w' to the top of the frame A. Each lever has a tooth y, which fits the notches z in the bent levers Z Z′ therefor, respectively, which are respectively pivoted to the frame A by pivots 8 8′. The bent levers W and W′ are pivoted at 6 6′, respectively,

to the upper and lower ends of the clamp-bar N, and the bent levers Z Z′ are respectively pivoted by pivots 7 7′ to the upper and lower ends of the clamp-bar N′. A downward pressure upon the free end of lever W will throw the clamp-bars together to clamp the strands. Spring 10 returns the lever to throw the clamp-bars apart.

In order to readily attach and detach the wire-holder to and from the member 2^d of the twister, a hollow cylindrical pin 12 is screwed into the boss d''' of said member and fits into the hub i of the hollow wire-holder I. Said hub i is furnished at one side with a notch 13, into which a latch 14 is arranged to catch when the holder is placed in position on the pin. The latch 14 is illustrated in Figs. IX, X, XI, and XII. It consists in a bar furnished with slots 15 at its ends, through which bolts 16 are passed and screwed into the member 2^d. The bar is undercut, as shown at 17, to form a lip 18 to fit in the notch 13 of the hub i. The outside edge of the lip slants relative to the axis of the slots 15, so that when the bar is moved endwise the edge of the lip will be wedged against the hub or will be withdrawn from the notch, as the case may be. A spring 19 holds the bar normally in position to wedge the lip against the hub to hold the wire-holder firmly in place on the hollow pin 12. To release the holder, the bar will be retracted against the pressure of the spring, thus to bring the notch 17 into position to allow the hub of the holder to be withdrawn from the pin 12.

The wire-holder I is composed of a cylindrical barrel i', which is furnished at one end with a permanent stop i^2 and with a removable circular head or disk 20. The barrel i' is formed at its other end in a number of resilient fingers 21, which are bent at their ends to hook upon a flange m of a detachable hollow hub i. The removable head 20 is furnished with an axial opening i^3, corresponding to the hole i^4 of the hub i, which fits upon the hollow cylindrical pin 12, which is screwed into the member 2^d of the twister.

i^5 indicates a groove in the inner wall of the hub i to hold the end of the wire during the process of winding.

In practice to insert the wire in the barrel the hub i will be unlatched and the barrel and hub removed. The band 22 will then be slipped back to release the fingers 21 and allow the hub i and the head 20 to be withdrawn from the barrel i'. The end of the wire L will then be inserted through the hole i^4 of the hub and brought into the groove i^5. Then a spindle (not shown) which is of the same diameter as the hollow cylindrical pin 12 will be inserted through the hub i and through the hole i^3 in the removed head 20, and the hub and head will be spaced apart on the spindle the same distance as they are spaced apart in the barrel when in use. Then the spindle will be rotated by any suitable means (not shown) and the wire wound thereon until the space between the head 20 and the flange m is filled. Then the spindle, with the wire thereon, the head 20, and the part m of the hub will be inserted into the barrel i', the fingers 21 being bent apart for this purpose, and then the band 22 will be brought into the position shown in Fig. VII to firmly clamp the fingers upon the flange m of the hub. Then the holder I, containing the wire, is withdrawn from the spindle, and the end of the wire L, which is thus left extending through the hole i^4 of the hub, will be inserted through the hollow cylindrical pin 12 and through the twister, and the hub i will then be placed upon said pin 12 and latched thereon. Then the machine is again ready for operation.

What I claim, and desire to secure by Letters Patent of the United States, is—

1. In a fence-machine, the combination with a carriage, of a vertically-movable twister-head thereon, provided with means for carrying a quantity of wire, and means for moving the head vertically comprising automatic means for rotating the head periodically, substantially as and for the purpose set forth.

2. In a fence-machine, the combination, with a carriage, of a vertically-movable, slotted twister-head mounted thereon provided with a wire-carrier, and means for moving the head vertically and periodically rotating it enough more than one or more complete revolutions to cause the slots to occupy diametrically opposite positions relatively to the succeeding wires.

3. In a fence-machine, the combination, with a carriage, of a vertically-movable twister-head mounted thereon, a wire-carrier detachably connected with the head, the sides of which are provided with flexible fingers, a head removably held by said fingers, and means for moving the head vertically and rotating it at the different horizontal strands of the fence.

4. In a fence-machine, the combination, with a carriage, of a vertically-movable twister-head mounted thereon, a wire-carrier detachably connected with the head, the sides of which are slotted longitudinally to form flexible fingers at one end, the fingers normally standing out beyond the plane of the sides and having their tips bent inward, a band around the fingers to force them inward as it is moved longitudinally toward the tips, a head adapted to be clamped between said tips, and means for moving the twister-head vertically and rotating it at the different horizontal strands of the fence.

5. In a fence-machine, the combination, with a carriage, of a vertically-movable, longitudinally-slotted perforated twister-head mounted thereon, a wire-holder secured to one end of the head eccentrically to its axis and in communication with said perforation,

and means for moving the head vertically and rotating it at the different horizontal strands of the fence.

6. In a fence-machine, the combination, with a carriage, of a vertically-movable rotary twister-head, means for rotating the head at the different horizontal wires of the fence, a lock for holding the head against rotation, and a longitudinally-movable releasing apparatus for the lock.

7. In a fence-machine, the combination, with a carriage, of a vertically-movable slotted twister-head, a slotted bar through the head, the ends of which are slotted to register with the slots of the head, a chain for engaging with the head and holding the head against rotation, and means for moving the head between the horizontal wires of the fence and rotating it around them.

8. In a fence-machine, the combination, with a carriage, of a vertically-movable, longitudinally-slotted twister-head thereon, a slotted bar through the head, the ends of which are slotted to register with the slots of the head, a slide for engaging with the ends of the bar, and means for operating the slide.

9. In a fence-machine, the combination, with a carriage, of a vertically-movable twister-head, a chain for rotating the head and carrying it from one to the other of the horizontal wires of the fence, a wheel in engagement with said chain, and a lock for holding said wheel against rotation when the head is being moved from one to the other of the horizontal wires of the fence.

10. In a fence-machine, the combination, with a carriage, of a frame mounted to move vertically thereon, a peripherally-grooved twister-head in the frame, one end of which is provided with sprocket-teeth, a sprocket-wheel journaled on the frame, provided with a lock for periodically locking it against rotation, and a sprocket-chain for rotating the head and moving it from one horizontal wire to the other of the fence.

11. In a fence-machine, the combination, with a carriage, of a frame mounted to move vertically thereon, a twister-head in the frame provided with sprocket-teeth, a lock for holding the head against rotation, a sprocket-wheel on the frame provided with a stop, a pawl for engaging with said stop, a sprocket-chain in engagement with the wheel and head, and means for locking the head against rotation as it is being moved from one horizontal wire of the fence to another.

12. In a fence-machine, the combination, with a carriage, of a frame mounted to move vertically thereon, a twister-head, and a sprocket-wheel on the frame, a slide and a pawl for locking the head and the wheel relatively against rotation, the slide being provided with a projection, a spring-actuated pin on the pawl for engaging with the projection, and a sprocket-chain for rotating the wheel and head and carrying them from one horizontal wire of the fence to the other.

13. In a fence-machine, the combination, with a carriage, of a frame mounted to move vertically thereon, a twister-head and a sprocket-wheel on the frame, means for locking the head and wheel against rotation, a slide for releasing said locking mechanism, a sprocket-chain for rotating the head and wheel and carrying them from one of the horizontal wires of the fence to another, and means for shifting the slide at the limit of the vertical movement of the frame.

14. In a fence-machine, the combination, with a carriage, of a frame mounted to move vertically thereon, a slotted twister-head and a sprocket-wheel on the frame, a slotted bar through the head and a pawl for the wheel, a slide provided with fingers and an inclined projection, the fingers being adapted to engage with the ends of the bar, a spring-actuated pin on the pawl for engaging with said projection, a sprocket-chain for operating the head and wheel, and means for shifting the slide at the limit of the vertical movements of the frame.

15. In a fence-machine, the combination, with a carriage, of a twister-head, a slide and a sprocket-wheel thereon, the wheel being provided with a cam, levers for moving the slide longitudinally, one end of each of which is adapted to be moved by the cam, and a chain for rotating the head and wheel and moving them from one horizontal wire of the fence to the other.

16. In a fence-machine, the combination, with a carriage provided with guides, a vertically-movable frame on the guides, a two-part twister-head, and a sprocket-wheel on the frame, one of the parts of the head being provided with sprocket-teeth and the other part with a wire-carrier, a sprocket-chain for rotating the wheel and head, and locking mechanism for holding them against rotation while they are being carried from one of the horizontal wires of the fence to another.

17. In a fence-machine, the combination, with a carriage, of a vertically-movable twister-head thereon, means for operating the head, two bars adapted to be placed upon opposite sides of the horizontal wires of the fence in position for engaging with the same, and means for simultaneously moving said bars toward or from each other.

18. In a fence-machine, the combination, with a carriage, of a vertically-movable twister-head thereon, means for operating the head, two bars in the frame, one of which is provided with notched pieces for engaging with the respective horizontal wires of the fence, interlocking levers for simultaneously moving the levers toward and from each other, and a foot-lever for operating said levers.

19. In a fence-machine, the combination, with a carriage provided with three sprocket-wheels, two of which are arranged in a vertical line and the other one is provided with a handle, a chain around said wheels, a ver-

tically-movable frame on the carriage provided with a twister-head and a sprocket-wheel in position to engage with the vertical portion of the chain, and means for periodically locking the head and wheel against rotation and causing them to be moved from one horizontal wire of the fence to another.

20. The combination of a carriage provided with wheels and with guides; a sprocket-chain trained upon said wheels; means for driving said sprocket-chain; a traveling frame mounted upon the guides; a sprocket-wheel carried by the traveling frame and meshing with the sprocket-chain and provided with a catch for a pawl; a rotary twister mounted in the traveling frame and provided with a sprocket-wheel meshing with the sprocket-chain and also provided with oppositely-arranged radial slots to receive the horizontal strands of the fence; a spool-holder mounted on the twister at one side of the axis thereof, a hole being provided through the twister for a wire led from said spool; a pawl mounted in a traveling frame to engage the catch of the sprocket-wheel; a spring for holding the pawl in engagement with the sprocket-wheel; a bolt for operating said pawl; a cam-slide for operating said bolt; a slide mounted on the twister to register therewith and provided with slots on opposite sides of the twister to register respectively with the radial slots of the twister, the portion between said slots of the slide being of greater width than the portion of said slots of the twister, and said slide being arranged to engage the cam-slide to operate it in different directions.

21. In a woven-wire-fence machine, the combination of a traveling carriage; bits on said carriage for holding the horizontal strands of the fence; a twister-carrier arranged to move up and down in said carriage along the plane of the strands held by said bits; a rotary twister provided with means for carrying a wire at one side of the axis of said twister, said twister being arranged with slots on opposite sides of its axis; successive strands held by said bits; means for moving the twister in the plane of said strands; and means for rotating the twister to twist a wire around said strands, respectively, and to alternately bring one and the other of the slots into position successively to receive the successive strands as the work proceeds.

22. In a woven-wire-fence machine, the combination with a traveling twister, of a sprocket-chain led around stationary wheels; a twister-carrier furnished with a twister; a sprocket-wheel engaging with the sprocket-chain for rotating said twister; a sprocket-wheel engaging with said chain for driving the twister-carrier; and means for holding a wire stationary in the path of said twister.

23. The combination of a twister-carrier consisting of two members $c\ c'$ mounted upon guides and provided in their adjacent ends with bearings $c''\ c'''$; a rotary twister provided with longitudinal grooves $d'\ d''$ and with an annular groove d into which the bearings $c''\ c'''$ seat to clasp the twister to hold it in the twister-carriage; a slide E arranged diametrically across the twister and provided with two recesses $e'\ e''$ to register with the longitudinal grooves $d'\ d''$ of the rotary twister and provided at its ends with shoulders e''' which limit the movement of the slide in the rotary twister; means for holding a wire in said twister; means for holding a wire strand in the path of said twister; and means for rotating the twister around the strand.

In testimony whereof I have signed my name to this specification, in the presence of two subscribing witnesses, at Los Angeles, California, this 23d day of August, 1901.

FRED STEBLER.

Witnesses:
JAMES R. TOWNSEND,
JULIA TOWNSEND.