

No. 750,839.

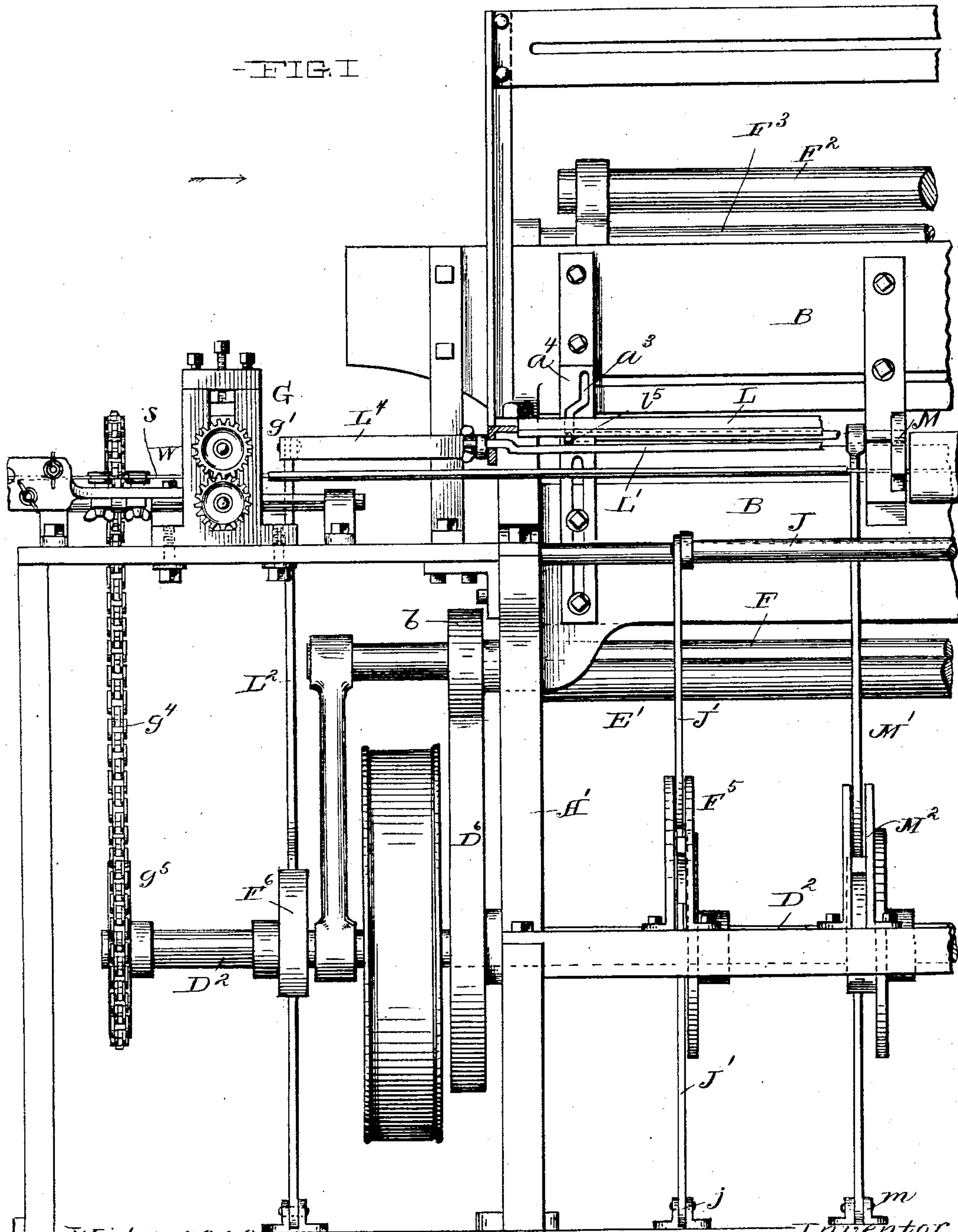
PATENTED FEB. 2, 1904.

J. J. FOSS.
WIRE FENCE WEAVING MACHINE.

APPLICATION FILED OCT. 25, 1901.

NO MODEL.

7 SHEETS—SHEET 1.



Witnesses,
Geo. Wm. Saywell
L. J. Davies

Inventor,
John J. Foss
By J. B. Fay. Atty.

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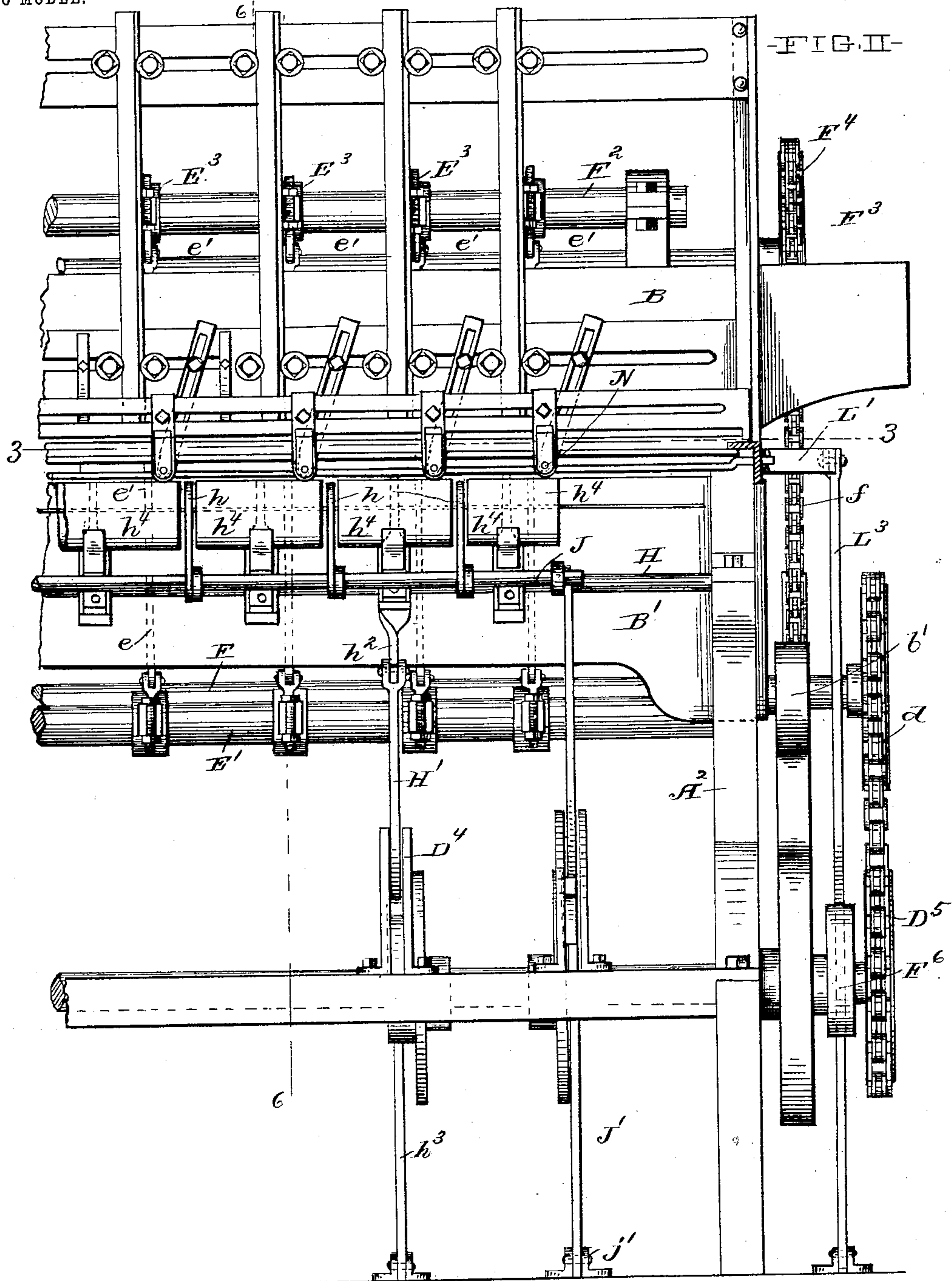
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7 SHEETS—SHEET 2.



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Geo. Wm. Saywell
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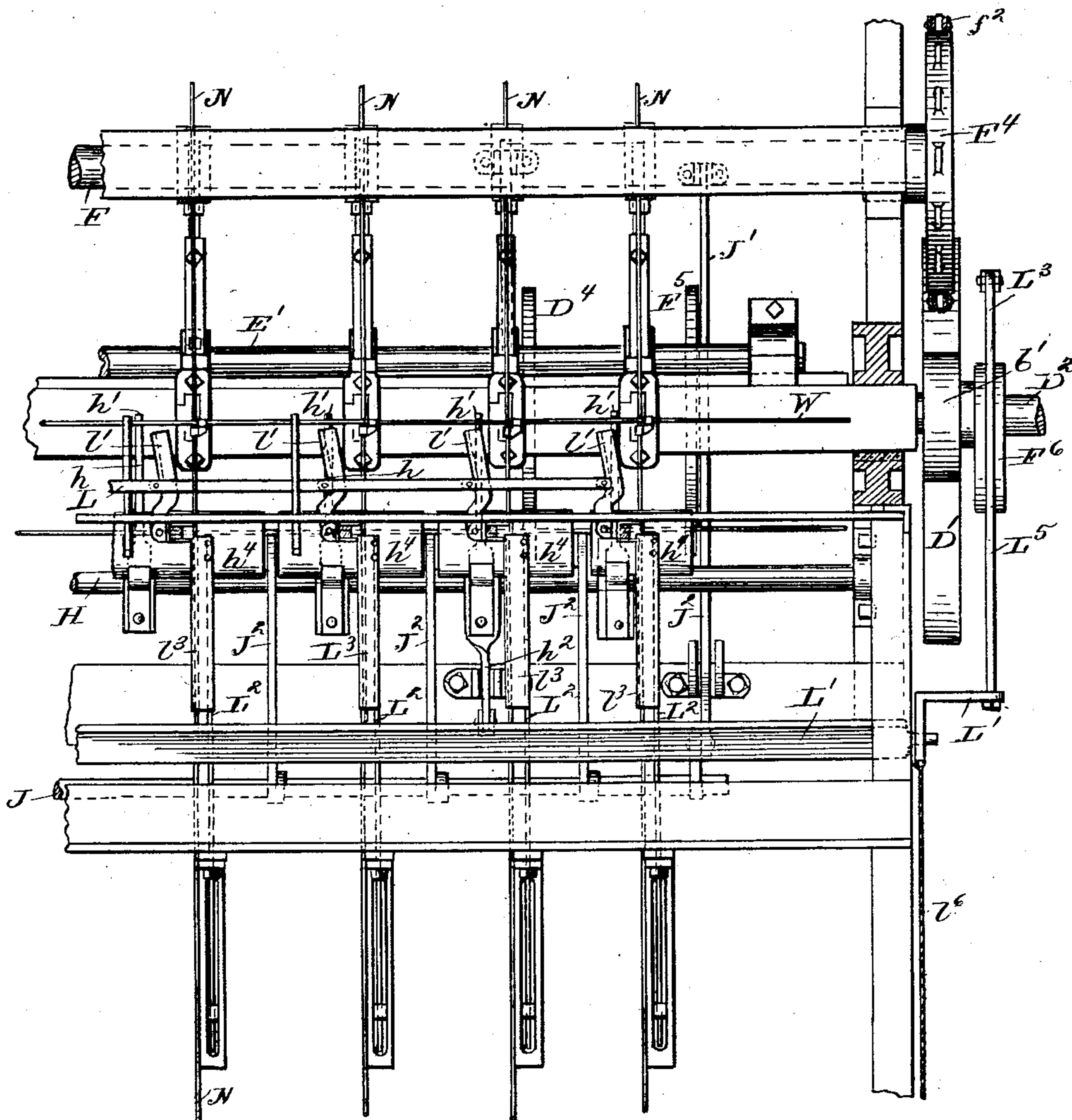
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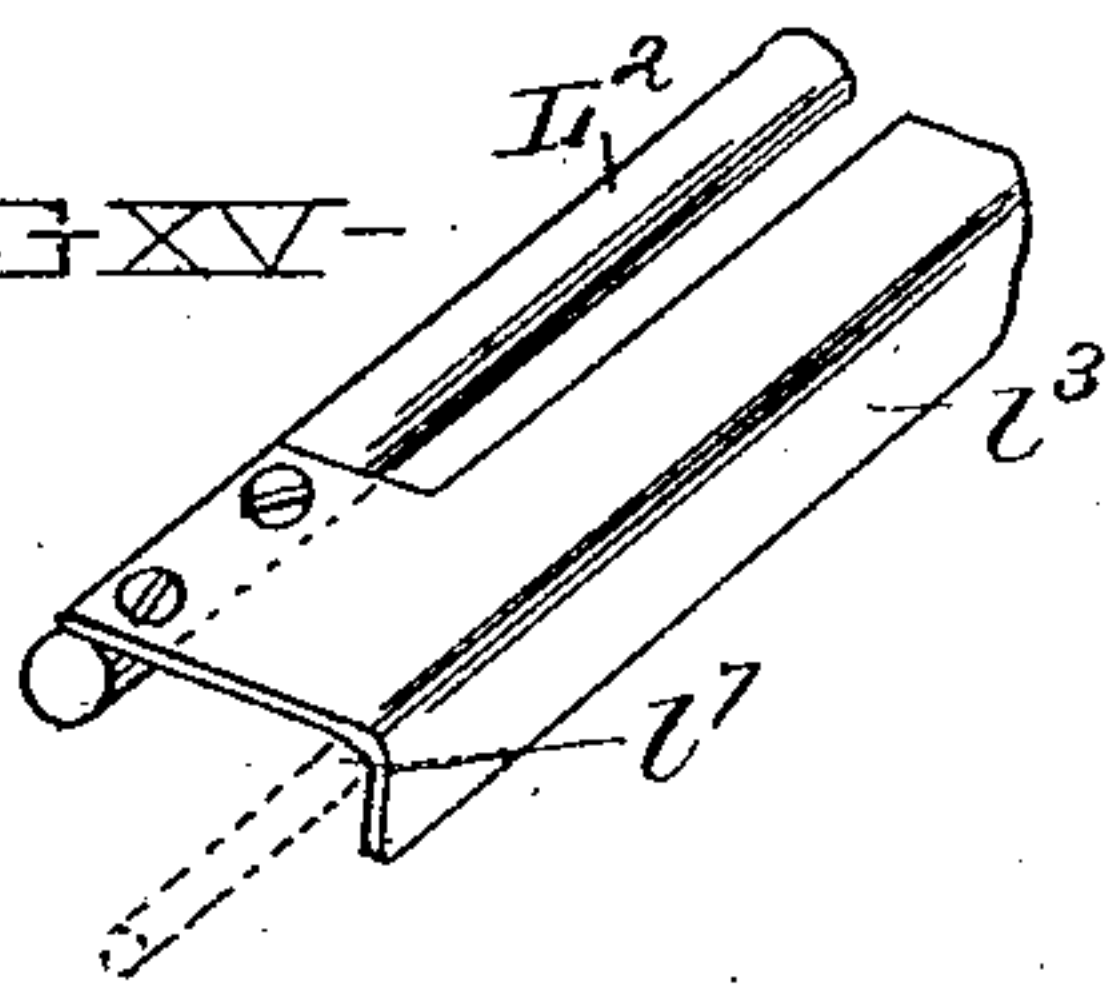
NO MODEL.

7 SHEETS—SHEET 3.

—FIG. III—



—FIG. XV—



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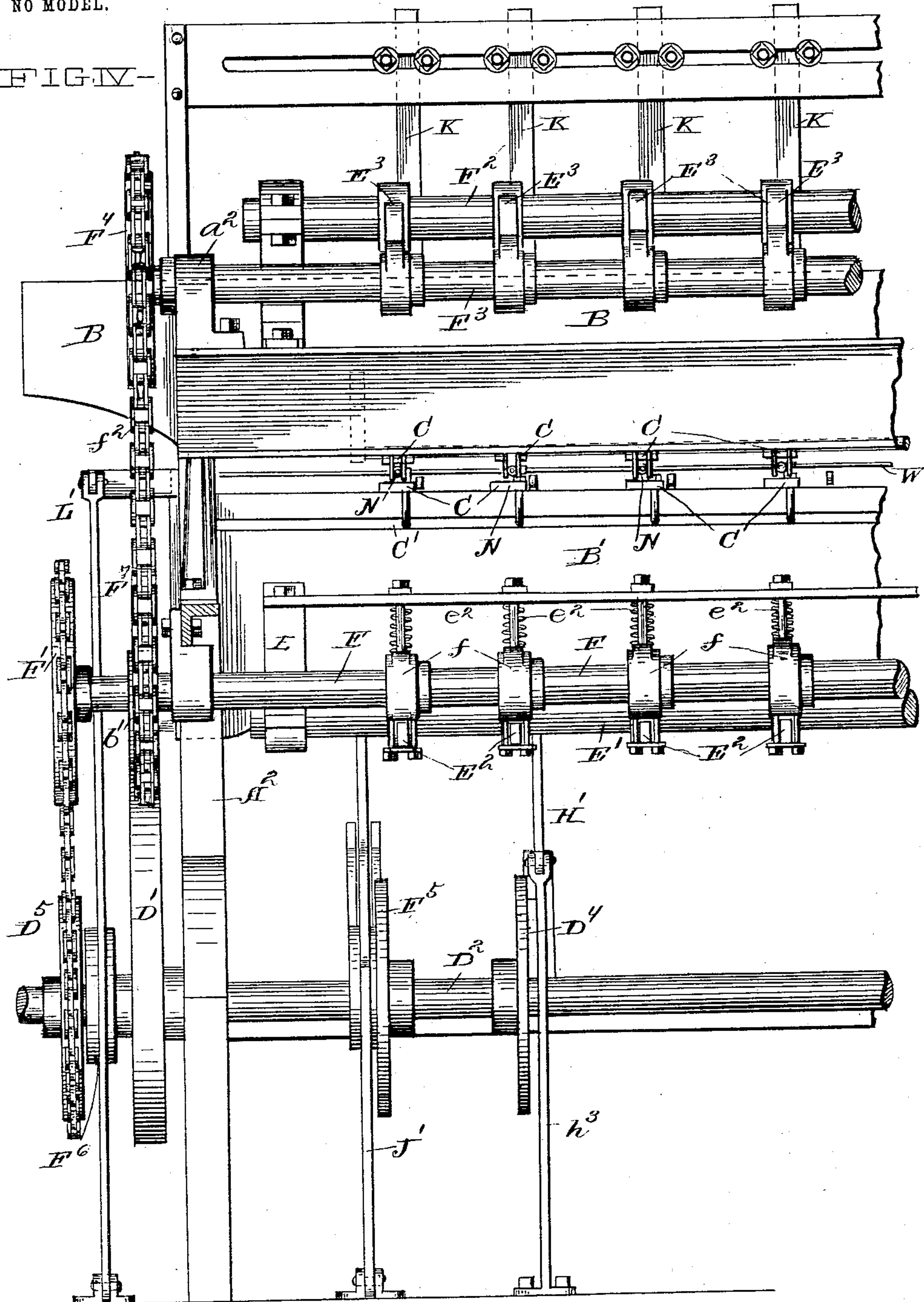
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7 SHEETS—SHEET 4.

NO MODEL.

FIG. IV.



Witnesses.
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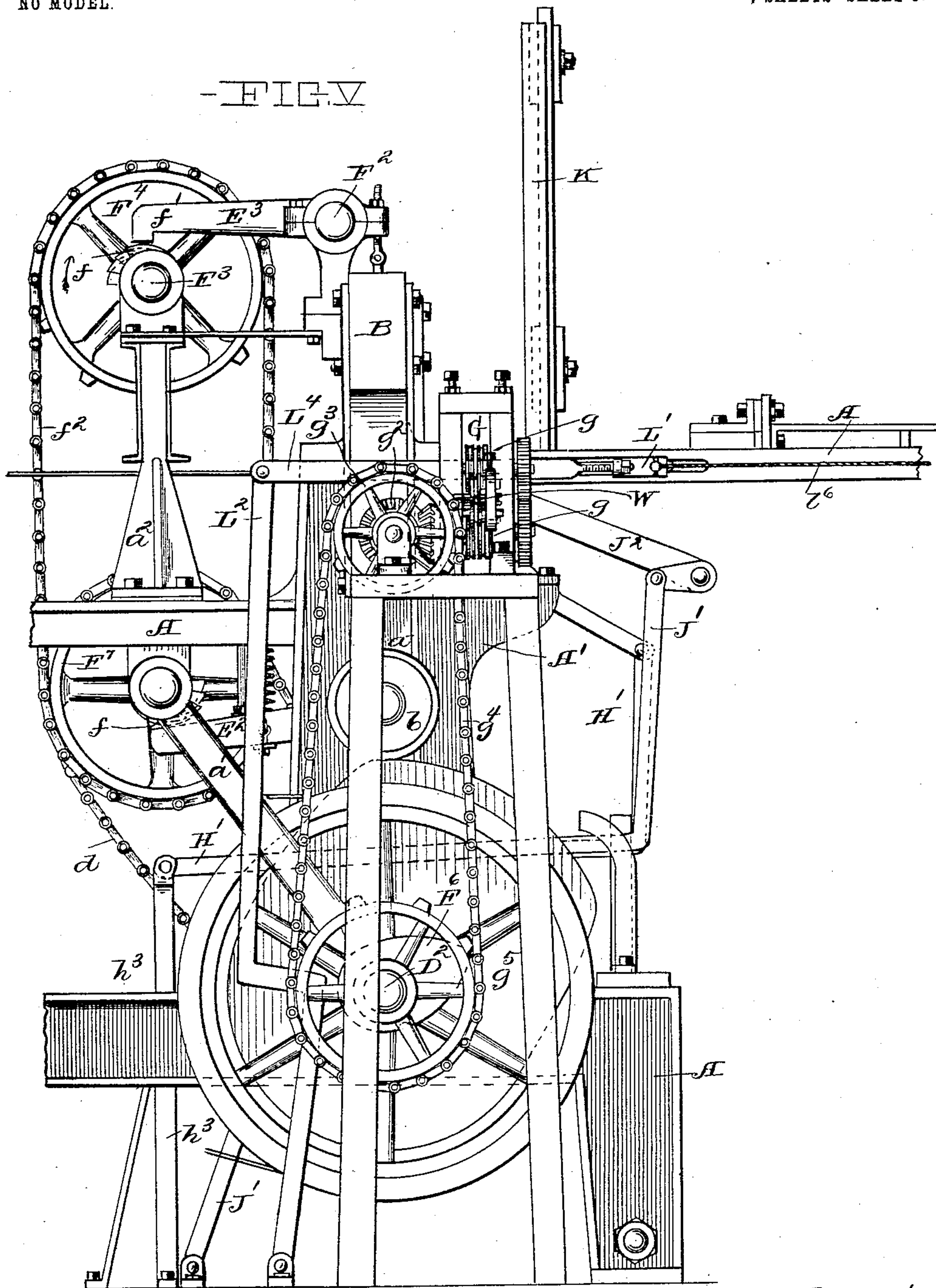
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APPLIOATION FILED OCT. 25, 1901.

NO MODEL.

7 SHEETS—SHEET 5.



Witnesses,
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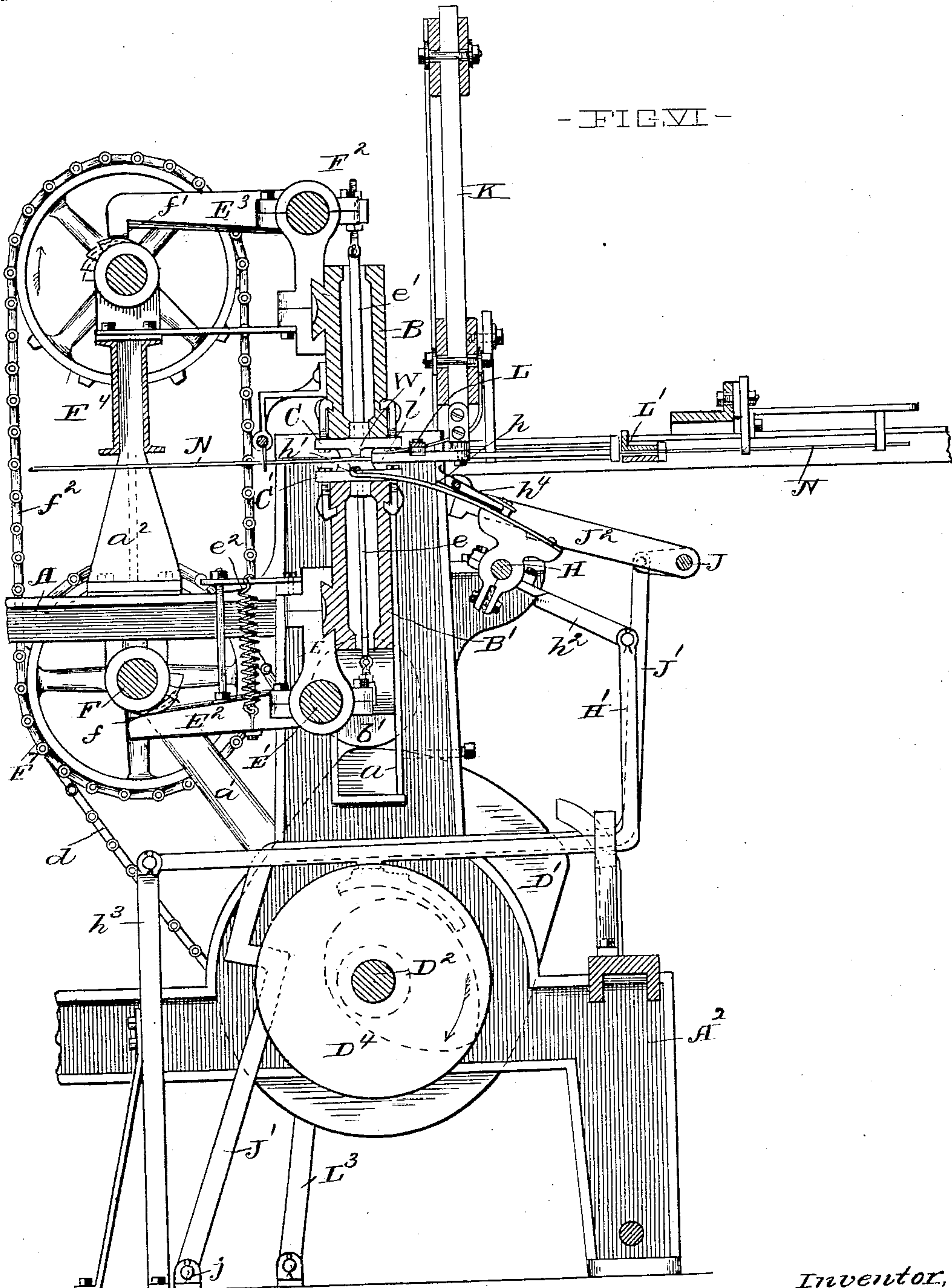
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APPLICATION FILED OCT. 25, 1901.

NO MODEL.

7 SHEETS—SHEET 6.



Witnesses,
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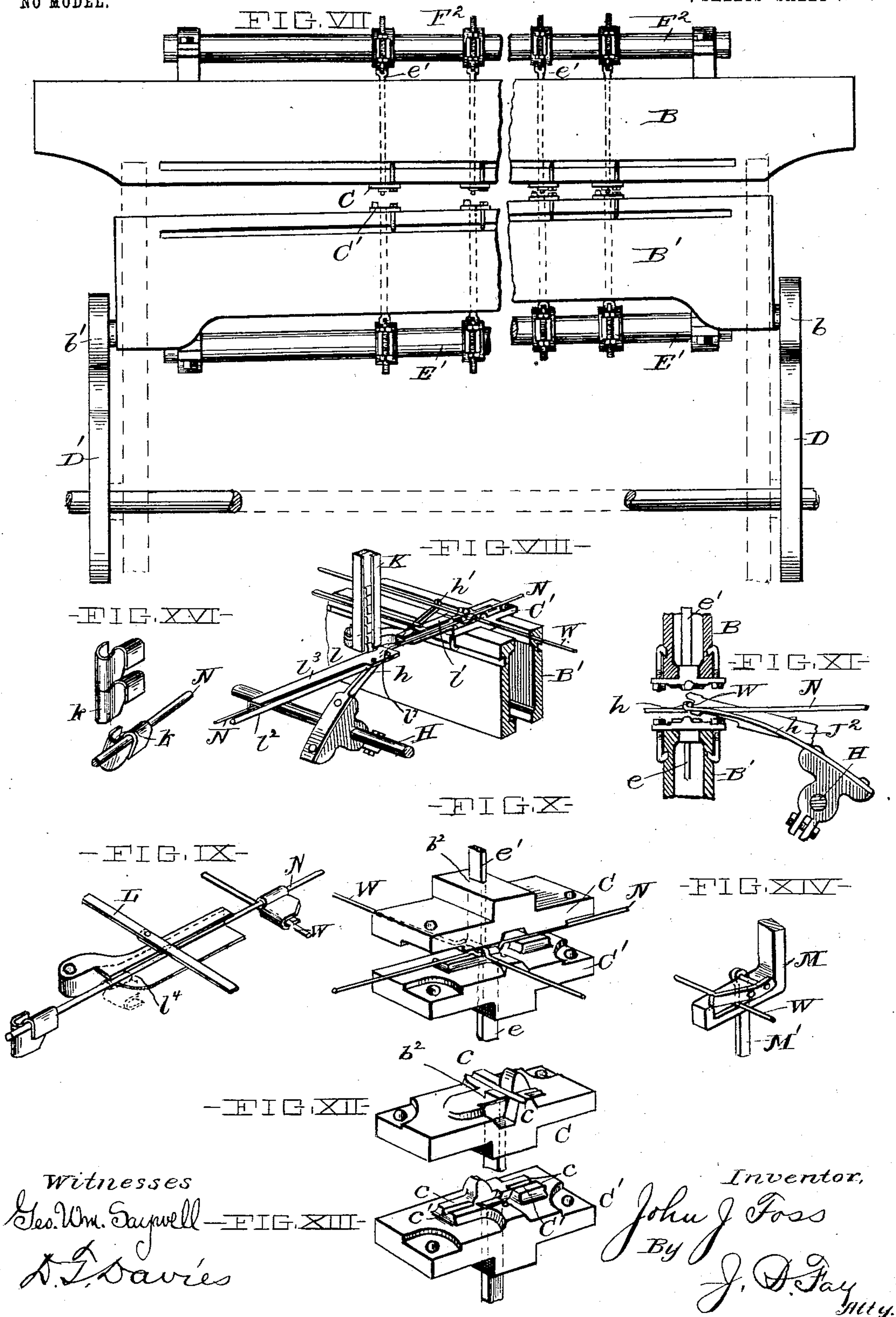
PATENTED FEB. 2, 1904.

J. J. FOSS.
WIRE FENCE WEAVING MACHINE.

APPLICATION FILED OCT. 25, 1901.

NO MODEL.

7 SHEETS—SHEET 7.



Witnesses
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D. I. Davies

Inventor,
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By J. D. Fay
Atty.

UNITED STATES PATENT OFFICE.

JOHN J. FOSS, OF GLENVILLE, OHIO, ASSIGNOR, BY MESNE ASSIGNMENTS, TO THE BOLEY WIRE FENCE COMPANY, OF SANDUSKY, OHIO, A CORPORATION OF OHIO.

WIRE-FENCE-WEAVING MACHINE.

SPECIFICATION forming part of Letters Patent No. 750,839, dated February 2, 1904.

Application filed October 25, 1901. Serial No. 79,975. (No model.)

To all whom it may concern:

Be it known that I, JOHN J. FOSS, a citizen of the United States, and a resident of Glenville, county of Cuyahoga, and State of Ohio, have invented a new and useful Improvement in Wire-Fence-Weaving Machines, of which the following is a specification, the principle of the invention being herein explained and the best mode in which I have contemplated applying that principle, so as to distinguish it from other inventions.

My invention relates to machines for automatically feeding line and cross wires of a wire fence and forming a permanent joint at their respective crossing-points, such machines being commonly referred to by manufacturers as "wire-fence-weaving machines."

The object of the invention is to provide a machine for automatically weaving wire fence in which a joint is employed such as is shown, described, and claimed in United States Letters Patent No. 615,651, issued to Jonathan Harris, December 6, 1898.

My said invention consists of means herein-after fully described, and specifically set forth in the claims.

The annexed drawings and the following description set forth in detail certain mechanism embodying the invention, such disclosed means constituting but one of various mechanical forms in which the principle of the invention may be used.

In said annexed drawings, Figure I represents a front elevation of an end of a wire-fence-weaving machine embodying my invention and from which the reels for winding the woven fence and intermittently feeding the line-wires have been omitted. Fig. II represents a front elevation of the other end thereof. Fig. III represents a horizontal sectional view of that end of said machine illustrated in Fig. II, taken upon the plane indicated by line 3 3 in said figure. Fig. IV represents a rear elevation of that end of the machine illustrated in Fig. II. Fig. V represents an end elevation of that portion of the machine embodying the invention and viewed in the direction indicated by the arrow in Fig. I. Fig.

VI represents a transverse cross-sectional view taken upon the plane indicated by the line 50 6 6, Fig. II. Fig. VII represents a detail broken elevational view of the clamp-supports and operating-cams therefor. Fig. VIII represents a detail perspective view of the clamp-feeding mechanism. Fig. IX represents a detail perspective view, on an enlarged scale, of the clamp-trough used in such feeding mechanism, showing a line-wire and clamps in connection therewith. Fig. X represents a detail perspective view of the two parts of a clamp, the plungers coacting therewith, and a crossed line and stay wire. Fig. XI represents an enlarged transverse sectional view of a part of the die-supports and the die parts, showing crossed wires in position therein and one of the guides connected therewith. Figs. XII and XIII represent detail enlarged perspective views of the two parts of a clamp used in the machine. Fig. XIV represents a perspective detail view of the shear used in said machine. Fig. XV represents a detail enlarged perspective view of one of the feeding-rods for feeding the clamps. Fig. XVI represents a perspective view of two clamps such as are utilized, showing their position relatively to the line-wire when they are being fed through the clamp-magazine and a third clamp in position on the line-wire.

Upon the upper portion of the frame A is secured a horizontally-disposed fixed die-support B, upon the lower surface of which are fixed at suitable intervals the upper parts C of the dies, as shown in Figs. IV and VII. A second die-support B' is mounted below support B in vertical slideways *a*, formed in the two lateral upright standards A' and A² of the frame A, as shown in Fig. VI. On the upper surface of said support B' are fixed at distances corresponding with the position of die parts C die parts C', whereby support B' may be vertically reciprocated and die parts C and C' caused to register and coöperate in the clamping operation. At each end of support B' are journaled rollers *b* and *b'*, which are respectively engaged by similar cams D and D', mounted upon the respective ends of a driv-

ing-shaft D^2 , Fig. I, driven by means of a suitable driving-pulley secured thereto. (Not shown.) These cams are so set upon said shaft as to cause one end of support B' to reach the
 5 end of its upward stroke prior to the time the opposite end reaches the upper end of its stroke, whereby such support is caused to rise in an inclined position and the dies caused to reach their operating position and perform
 10 their functions successively. Such relative position of the dies at the time one end reaches its uppermost stroke end is illustrated in Fig. VII.

Journalled in hangers E , Figs. II, III, and
 15 VI, secured upon the rear of support B' , is a fixed shaft E' , upon which are fulcrumed a series of levers E^2 , whose forward arms are secured to and operate vertically-reciprocable plungers e , which pass upwardly through sup-
 20 port B' , each die part C' being pierced by one such plunger. These plungers coöperate with the dies, as will hereinafter appear, to perform the clamping operation, the die parts being provided with suitable apertures b^2 for such
 25 purpose, Fig. XII. Springs e^2 are provided for maintaining a normal or inoperative position of said plungers, Figs. IV and VI.

Upon arms a' , fixed to the frame, is journaled a shaft F , driven by a sprocket-wheel
 30 F^7 , upon which are secured a series of cams f , so located and timed as to engage the levers E^2 when the support B' reaches the upper portion of its upward stroke and set so as to operate successively upon said arms to corre-
 35 spond with the successive operation of the corresponding dies—that is, looking at the rear of the machine, Fig. IV, the levers are actuated successively from right to left, the right-hand end of support B' being the first to reach its
 40 highest point and the die located at the extreme right being the first to perform its function. Similar plungers e' coöperate with the upper die parts C in a like manner and are secured upon the ends, respectively, of a series
 45 of levers E^3 , journalled upon a shaft F^2 , secured to the upper support B , Fig. VI. These levers are successively actuated by means of a series of cams f' , secured to a shaft F^3 , journaled in bearings supported upon standards a^2 ,
 50 secured to the frame. Said shaft is driven by a sprocket-wheel F^4 of a diameter equal to that of sprocket-wheel F^7 , which is driven by a sprocket F' , driven by a sprocket D^5 and chain d , secured to driving-shaft D^2 , and geared
 55 therewith by means of a sprocket-chain f^2 , whereby equal angular velocities are imparted to each of the two sets of cams f and f' .

Upon one end of the frame—the left as illustrated—is a device G , Fig. I, consisting of
 60 suitably-located rollers g , Fig. V, mounted in a stand g' , geared together and driven by a train of bevel-gears g^2 , which in turn are driven by a sprocket-wheel g^3 , geared by means of a chain g^4 to a lower sprocket-wheel
 65 g^5 , which is secured to the driving-shaft D^2 ,

Figs. I and V. These rollers are geared together, so as to be adapted to feed a wire W longitudinally through them and across the front of the machine, as shown in Fig. I, their particular construction and arrangement be-
 70 ing old and well known and forming *per se* no part of my invention.

Upon a rock-shaft H , journalled in the frame, Figs. II, III, and VI, are secured a series of
 75 guides h , which extend inwardly and are each provided with an upwardly-hooked end h' . One such guide end is located between each two adjacent die parts C , Fig. III, and each is capable of oscillation with rock-shaft H . Such
 80 oscillation is procured through the medium of an arm h^2 , to the end of which is attached the upper end of a bent lever H' , Figs. II and VI, the lower end of which is fulcrumed upon a standard h^3 , and a cam D^4 , secured to driving-
 85 shaft D^2 , adapted during its rotation to engage and oscillate said lever in a manner and at a time as hereinafter described. Such oscillation of the guides h effects a movement of their end toward and from the die parts C .

Upon a bar J , which is fixed upon the up-
 90 per end of two oscillatory levers $J' J'$, Figs. I and II, which are fulcrumed at j and j' upon the floor, are fixed a series of pushers J^2 , which when the levers are oscillated pass be-
 95 tween the guides h and die parts C , such oscillation being effected by means of two cams $F^5 F^5$, secured to shaft D^2 and adapted to engage lever J' .

Secured upon each guide h is a U-shaped
 100 trough h^4 , which together form a receptacle for the stay-wire which is placed therein after being cut off from the wire W , as hereinafter explained, lying in the path of the pushers, whereby the latter may be caused to move
 105 such stay-wire out of the trough and along the guides h .

Upon the top of the frame is secured a series of clamp-magazines K , one for each die, in which are placed a column of small clamps k . These clamps are formed from the blanks
 110 shown in the above-named patent by bending the lateral projections into U-shaped form, as shown in Fig. XVI, and placed in the magazines in the position illustrated, this bending
 115 operation being performed in a separate machine on which application for separate Letters Patent will be made.

Below the discharging end of each magazine is a feeding device comprising a sliding reciprocable member l and a longitudinally-fixed
 120 guiding-trough l' , the latter terminating just below die member C . Said sliding member consists of a rod l^2 , to which is secured a stop-guard l^3 , consisting of an angle-plate whose top surface covers the bottom of the trough
 125 during the slide's reciprocation, excepting at the end of the return stroke, when it uncovers such bottom sufficiently to allow one clamp to drop out, holding the remainder of the clamps in the magazine until such position of the slide
 130

is reassumed at the end of the next return stroke. Such guard is provided with an eye l' , through which the line-wire may be led.

The line-wires are intermittently fed under the die parts C by suitable mechanism (not shown) and driven by a pulley D^6 , Fig. I, such intermittent feeding being timed to take place after a clamping operation is performed. These wires are led under the stop-guards and through an eye in the front of the pusher, as shown in Figs. VIII and XV, and immediately below the magazines, so that as soon as a clamp is released from one of the latter it drops upon the corresponding line-wire and hangs by the upper U-shaped projection, as shown in Fig. XVI. As will hereinafter appear, it is necessary to turn the clamps after dropping upon the line-wire so as to assume a horizontal position. To effect such position, the guiding-trough l' is employed and is provided with a cam-surface l^4 , which when the clamp is pushed into the trough turns same into the required position.

The inner end of each trough l' is hinged, so that it may be swung to the left and out of the path of the lower die part C' when the latter is raised to engage the upper die part C. To effect such movement, these hinged ends are attached to a rod L, which is actuated to the left when support B' is raised by means of a cam-slot a^3 , formed upon a bar a^4 , secured to support B' and engaging a pin l^5 , secured to bar L.

To effect the reciprocation of the feeding-slides l , a bar L' is provided, to which all the slides are attached, Fig. III, such bar being reciprocated by means of two levers L^2 and L^3 and links L^4 and L^5 at each end of the machine, Figs. I and II, actuated by cams F^6 F^6 . The forward stroke of reciprocation is effected by these cams, the return stroke being imparted by any suitable means, such as springs or weights. As shown in Fig. V, a cord l^6 is attached to each end of bar L, to the ends of which are attached suitable weights. (Not shown.)

Located in the path of movement of the wire W, fed by means of the feeding device G, is a shear M, Fig. I, intermittently operated by means of a lever M' , Fig. I, fulcrumed at m to the floor, operated by a cam M^2 , secured to shaft D^2 .

The die parts C and C' , Figs. XII and XIII, are formed with suitable lugs c and channels c' , which engage the crossed wires and crimp same on each side of the clamp, as shown in Fig. X, it being not my intention to claim this die construction in the application.

The above-described device operates as follows: The shaft D^2 is driven continuously, thereby causing the feeding-rollers to rotate continuously and when the jaws of the shears M are open, as in Fig. XIV, to feed the wire W across the machine and into the troughs h^4 . The cam M^2 is so timed as to then operate the

shear, so as to cause the latter to cut off a stay-wire from wire W. The shear-jaws now remain closed, whereby the continuously-rotating rollers g become inoperative and slide upon the wire, these rollers being adjusted so as to exert a pressure upon wire W to properly allow such action. After such cutting operation the cam D^4 operates lever H' to elevate the hooked ends of the guides, and cams F^5 F^5 simultaneously operate to cause the pushers J^2 to move forward and push the stay-wire S under the die parts C and below the line-wire N, Fig. XI, such guides guiding it into proper position and the hooked ends thereof preserving such position. While such movements are taking place the stop-guards l^3 have been drawn back by the weights or cords l^6 to permit a clamp k to drop upon each line-wire after the stay-wire has been fed to the dies. These clamps have been previously loaded into the magazine. The cams F^6 now act and cause the slide-rods to push the clamp into the troughs l' , the cam-surfaces l^4 of which effect their proper entrance and push the clamp upon the crossed line and stay wires beneath the die parts C and cause their U-shaped projections to respectively engage such line and stay wires, as shown in Fig. IX. Meanwhile the cams D and D' have begun to raise the die-support B' and upon reaching the upper end of the upward stroke have effected the removal of the hinged trough ends by the action of the cam-slot a^2 , whereby such ends are removed from the field of operation of the die parts. Such die parts now act upon the clamps and in conjunction with the plungers e and e' clamp the U-shaped projections upon the line and stay wires, respectively, and crimp such wires on each side of such clamp, so as to prevent the subsequent displacement of the latter in a manner such as described in said above-named patent. Such coöperation of the plungers has been effected by the action of the cams f f' , which are continuously rotating driving-shaft D^2 and each timed so as to effect such action of the plunger when its respective die part C' reaches the end of its upward stroke. The pushers J^2 have now been returned, the shear-jaws opened, whereby the wire W is again fed into the trough h^4 ready to again be cut off. Upon the subsequent recession of the die-support B' cam D^4 acts upon lever H' to depress the hooked ends of the guide h , and thereby allow the clamped stay-wires to pass, when the mechanism for operating the winding-reel (not shown) is now put into action to feed the line-wires forward. The slide-rods l^2 meanwhile have also been withdrawn by the weights or cords on the recession of cams F^6 , the completion of such withdrawal, however, not occurring until the next stay-wire has been fed forward. The recession of support B' has now permitted the hinged trough ends to reassume their normal position. By causing the dies to act successively instead of simul-

taneously a great saving in power and constructive material is effected, since the simultaneous action of the die would multiply such power by a factor represented by the number of dies and necessitate an attendant corresponding increase in the weight and strength of the parts. Such advantage is further increased by causing the plungers to act independently of the dies to clamp the clamps, permitting the dies themselves to perform the crimping operation only.

Other modes of applying the principle of my invention may be employed instead of the one explained, change being made as regards the mechanism herein disclosed, provided the means stated by any one of the following claims or the equivalent of such stated means be employed.

I therefore particularly point out and distinctly claim as my invention—

1. In a fence-weaving machine, the combination of a series of die parts mounted upon a support, a second series of die parts mounted upon a second and reciprocable support, a series of plungers, and means for operating said die parts and plungers successively to effect a clamping operation.

2. In a fence-weaving machine, the combination of means for feeding line-wires, a series of clamping devices, and means for operating such devices successively in a direction transversely relatively to said line-wires.

3. In a fence-weaving machine, the combination of a series of die parts mounted upon a support, a series of complementary die parts mounted upon a second support, and means for effecting relative reciprocation of said supports, said means adapted to effect the approach to one support, during the reciprocatory stroke, of one end of the other support in advance of that of the other end.

4. In a fence-weaving machine, the combination of a series of die parts mounted upon a support, a series of complementary die parts mounted upon a second support, means for effecting relative reciprocation of said supports, said means adapted to effect the approach to one support, during the reciprocatory stroke, of one end of the other support in advance of that of the other end, a series of plungers, and means for operating them successively to effect with the dies a clamping operation.

5. In a fence-weaving machine, the combination of a series of die parts mounted upon a support, a series of complementary die parts mounted upon a second support, means for effecting relative reciprocation of said supports, a series of plungers, one such plunger passing through each die, and means for operating said plungers successively to effect a clamping operation, said means adapted to operate each plunger when its respective die part has reached the end of its upward stroke.

6. In a fence-weaving machine, the combination of means for feeding line-wires, a series

of two-part dies, and means for effecting successive operation of said dies in a direction transverse relatively to said line-wires.

7. In a fence-weaving machine, the combination of means for feeding line-wires, a series of two-part dies, a series of plungers operating in connection with such dies, and means for effecting successive operation of said dies and plungers in a direction transverse relatively to the said line-wires.

8. In a fence-weaving machine, the combination of means for feeding line-wires, a series of two-part dies, a series of plungers operating in connection with said dies, and means for operating said dies successively in a direction transverse relatively to the said line-wires and for operating said plungers independently.

9. In a fence-weaving machine, the combination of a series of die parts mounted upon a support, a second series of die parts mounted upon a second and reciprocable support, each support provided with a series of plungers, one such plunger passing through each die and adapted to operate in connection therewith to effect a clamping operation, and means for operating such plungers successively and independently of the dies.

10. In a fence-weaving machine, the combination of a die comprising two parts mounted so as to be reciprocable relatively to each other, a reciprocable plunger passing through each such die, means for effecting such relative reciprocation and means independent of such latter means for effecting the reciprocation of said plungers, the latter adapted to coact with said dies to effect a clamping operation.

11. In a fence-weaving machine, the combination of means for feeding line-wires, a series of die parts mounted upon a support, a second series of die parts mounted upon a second and reciprocable support, each support provided with a series of plungers, one such plunger passing through each die and adapted to operate in connection therewith to effect a clamping operation, and means for operating such dies and plungers successively in a direction transverse relatively to said line-wire to effect such clamping operation.

12. In a fence-weaving machine, the combination of a clamp-magazine, means for feeding a line-wire, means for feeding a stay-wire transversely of said line-wire, means for feeding a clamp from said magazine to said stay-wire, and means for holding the latter while such clamp is being fed thereto.

13. In a fence-weaving machine, the combination of a clamp-magazine, means for feeding a line-wire, means for feeding a stay-wire transversely of said line-wire, means for feeding a clamp from said magazine to said stay-wire, means for holding the latter while such clamp is being fed thereto, and a die comprising two parts mounted so as to be reciprocable

relatively to each other and adapted to effect a clamping operation.

14. In a fence-weaving machine, the combination of a clamp-magazine, means for feeding a line-wire, means for feeding a stay-wire transversely of said line-wire, and means for feeding a clamp from said magazine to said stay-wire adapted to control the discharge of clamps from said magazine.

15. In a fence-weaving machine, the combination of a clamp-magazine, means for feeding a line-wire, means for feeding a stay-wire

transversely of said line-wire, means for feeding a clamp from said magazine to such stay-wire adapted to control the discharge of clamps from said magazine, and means for holding said stay-wire while said clamps are being fed thereto.

Signed by me this 30th day of September, 1901.

JNO. J. FOSS.

Attest:

D. T. DAVIES,
A. E. MERKEL.