(No Model.) 2 Sheets—Sheet 1.

F. VAN DOREN & L. LOVEJOY.

FENCE MACHINE.

No. 379,426. Patented Mar. 13, 1888.

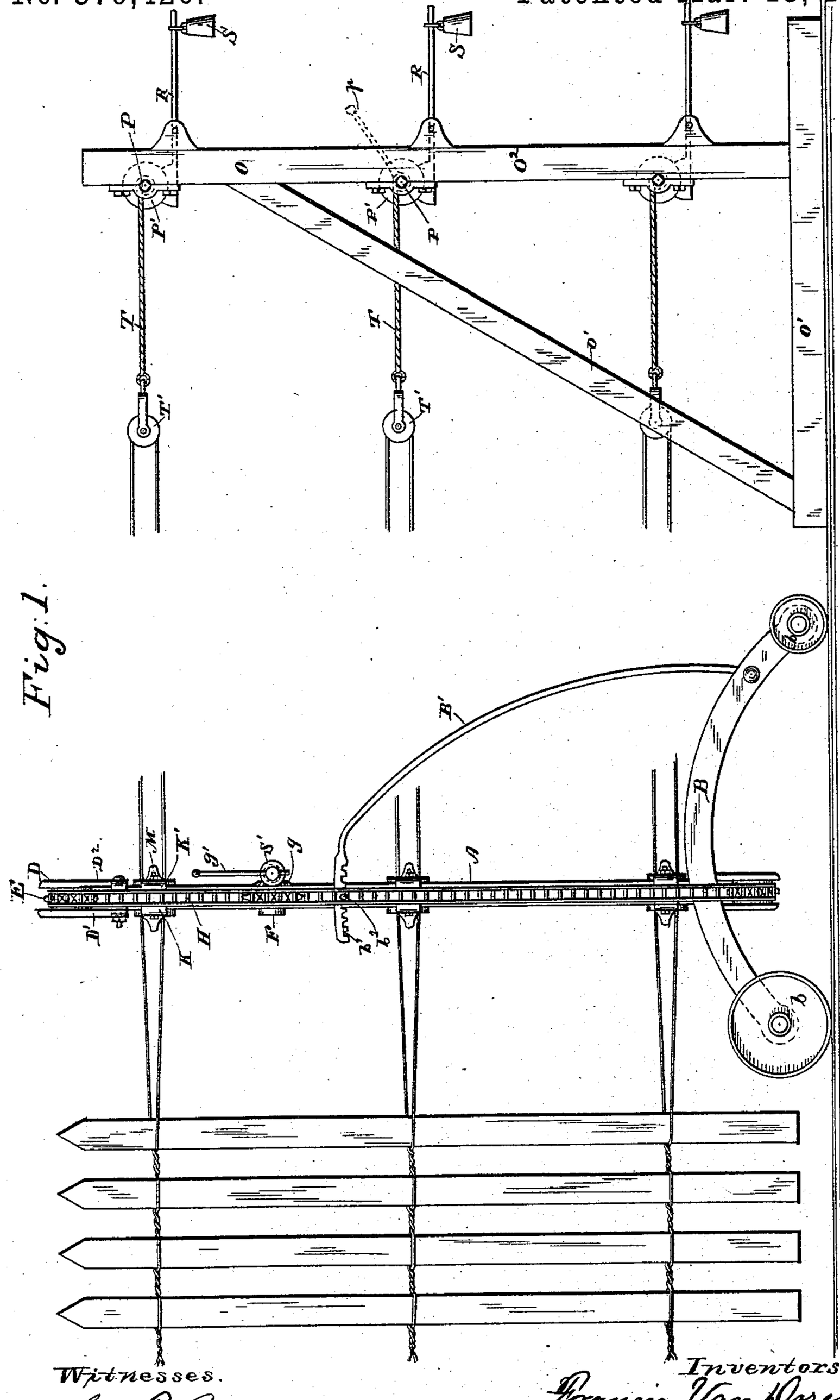

Fig. 1.

Witnesses.
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(No Model.) 2 Sheets—Sheet 2.

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Fig. 3

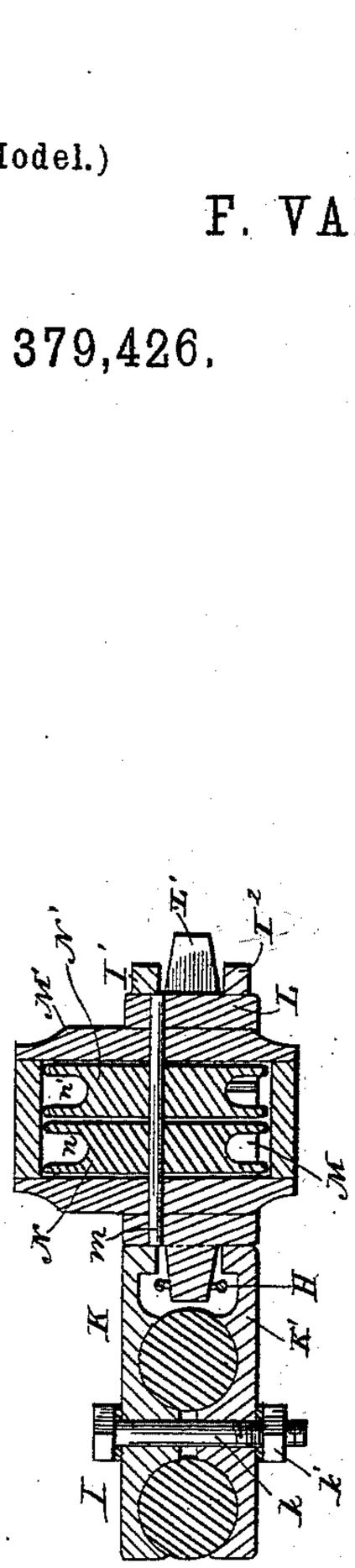


Fig. 4.

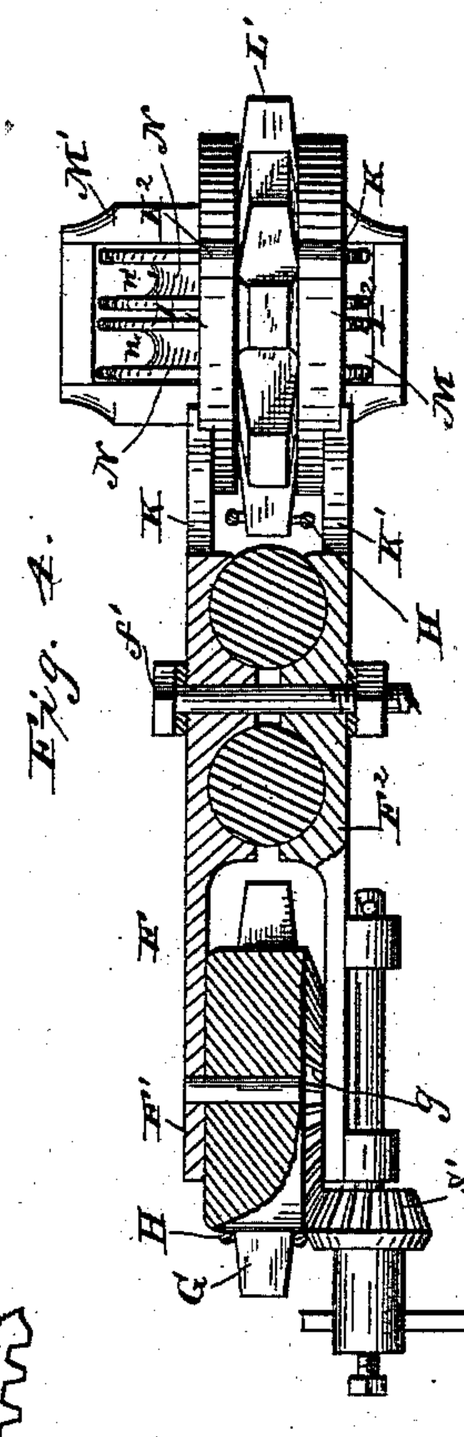


Fig. 5.

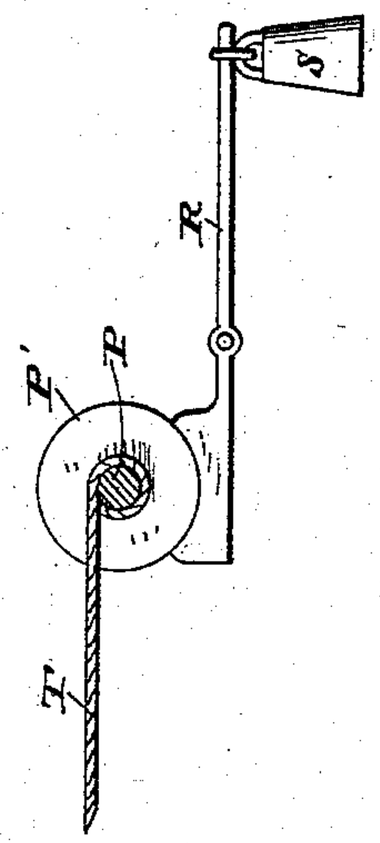


Fig. 6

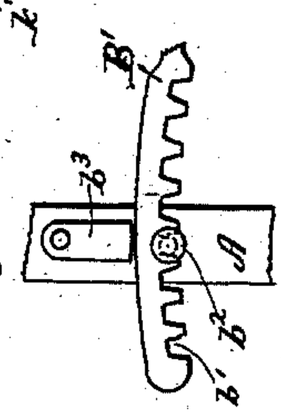


Fig. 7.

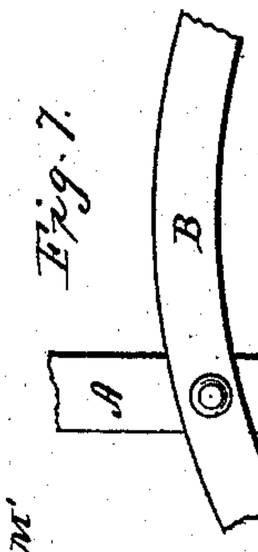
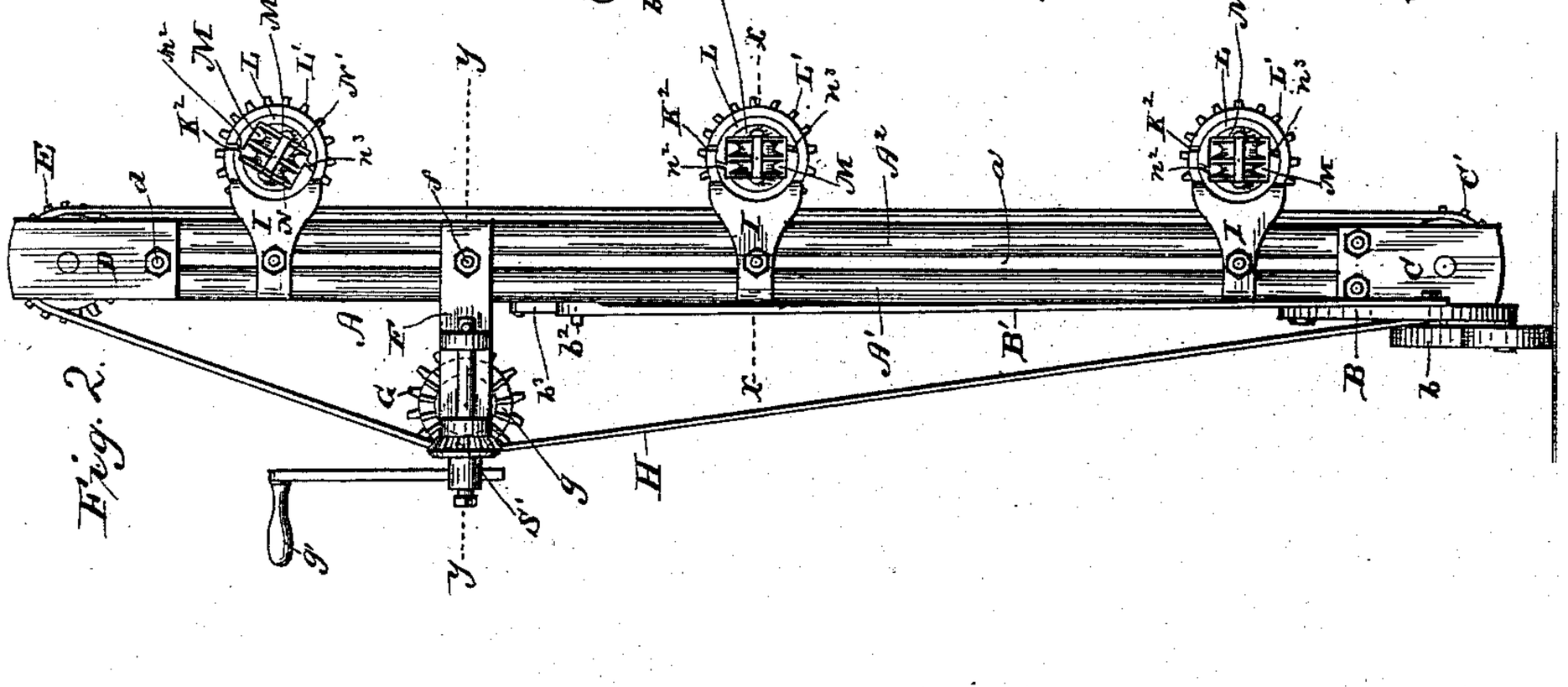


Fig. 2.



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Francis Van Doren.
Loyal Lovejoy
by Franck W. Johnson.
Attorney.

UNITED STATES PATENT OFFICE.

FRANCIS VAN DOREN AND LOYAL LOVEJOY, OF ADRIAN, MICHIGAN.

FENCE-MACHINE.

SPECIFICATION forming part of Letters Patent No. 379,426, dated March 13, 1888.

Application filed September 6, 1887. Serial No. 248,939. (No model.)

To all whom it may concern:

Be it known that we, FRANCIS VAN DOREN and LOYAL LOVEJOY, citizens of the United States, residing at Adrian, in the county of Lenawee and State of Michigan, have invented certain new and useful Improvements in Fence-Machines; and we do hereby declare the following to be a full, clear, and exact description of the invention, such as will enable others skilled in the art to which it appertains to make and use the same.

Our invention relates to improvements in that class of fence-machines which operate to secure the pickets to the line-wires of a combined wire-and-picket fence, and which also form the fence at the place and in the position where it is to be permanently located; and it further relates to improvements in devices for stretching the line-wires and holding them under tension, the same to be used in combination with the fence-machine.

The particular construction and arrangement of the various parts of our invention we will now proceed to point out and describe, reference being had to the accompanying drawings, in which—

Figure 1 is a side elevation of the machine and wire stretcher shown connected to a fence in process of construction. Fig. 2 is a view showing an elevation of the fence-machine taken at right angles to the elevation of Fig. 1. Fig. 3 is a horizontal section taken on line *x x* of Fig. 2. Fig. 4 is a horizontal section taken on line *y y* of Fig. 2; and Figs. 5, 6, and 7 are details.

Referring to said drawings, A represents the main frame of the machine, composed of two standards, A′ A², preferably round in cross-section, and rigidly secured to each other at their upper and lower ends by cross-pieces *a a*, so as to leave an opening, *a′*, between the standards. Said frame A is supported upon a truck or frame, B, provided with wheels *b b* and pivotally secured to the lower end of the frame.

B′ is a brace pivotally secured at one end to the truck, the free end of the brace being provided with notches *b′*, which engage with a pin, *b²*, on the upper part of the frame.

b³ is a locking-latch which holds the brace in engagement with the pin *b²*. By means of this brace the frame can be adjusted at any desired vertical angle to accommodate the machine to the inclination of the ground.

C is a bearing formed on the lower end of and projecting below the frame A, in which is mounted a sprocket-wheel, C′.

D is a vertically-adjustable bearing formed of two plates, D′ D², the lower ends of which conform on their inner sides to the shape of the standards and engage with opposite sides of said standards.

d is a bolt provided with a nut, which bolt passes through the opening *a′* and lower ends of the plates D′ D². By tightening the nut on the bolt the plates are clamped against the standard and are held at the desired point of adjustment, for a purpose hereinafter set forth.

E is a sprocket-wheel mounted in the bearing D.

F is a vertically-adjustable bracket formed of two arms, F′ F². The inner surfaces of the inner ends of said arms conform to and engage with the standards A′ A², and are secured at any desired point on the frame by means of a bolt passing through the opening *a′* and arms F′ F², and provided with a suitable clamping-nut, *f′*. In the outer end of the bracket is mounted a driving sprocket-wheel, G. Said wheel G is provided with a bevel-gear, *g*.

S′ is a bevel-pinion mounted on the bracket and engaging with the bevel-gear *g*, and provided with an operating crank, *g′*.

H is an endless sprocket-chain passing over the sprocket-wheels C′, E, and G.

I are vertically-adjustable circular bearings in which are mounted the twisting-wheels. Each of said bearings is composed of two similarly-formed circular parts, I′ I², having an opening, *i*, between the same, and provided with the arms K K′, the inner surfaces of the inner ends of which conform to the shape of and engage with the standards A′ A², and are secured to and held at any desired point on said standards by bolts *k*, passing through the opening *a′* and arms K K′, and provided with clamping-nuts *k′*.

K² are slots in the top of the two parts of the bearings I. These bearings I are on the side of the frame opposite to that on which the driving sprocket-wheel is located.

L are the twisting-wheels mounted in the

bearings I. Said wheels are provided with spur-teeth L′, which project between the parts I′ I² of the bearings I and engage with the endless sprocket-chain H, which passes between the arms K K′ and on the inside of the twisting-wheels between said wheels and the main frame.

M is an opening in the central portion of each twisting-wheel. In this opening is secured a frame, M′, provided with a spindle, *m*, arranged at right angles to the axis of the wheel. On this spindle are mounted two roller-bearings, N N′, for the line-wires. Said bearings are provided with annular grooves *n n′* in their peripheries, in which the wires rest.

*n*² *n*³ are slots in the wheel M for the insertion of the wires, said slots being diametrically opposite each other, one slot, *n*², being coincident with the groove in the bearing N, the other slot, *n*³, being coincident with the groove in the pulley N′.

The operation of the twisting mechanism will be hereinafter described.

O represents the frame of the wire-stretcher, which consists of suitable bed-pieces, O′, uprights O² O², cross-piece *o*, and braces *o′ o′*. In the uprights are mounted any desired number of shafts P, corresponding to the number of pairs of line-wires. In the drawings three shafts are shown. On each shaft is rigidly secured a friction-wheel, P′.

R represents a series of friction brake-levers pivoted to one of the uprights O², corresponding in number to the number of the shafts P. The forward ends of said brake-levers engage with the wheels P′. To the rear ends of the brake-levers are secured suitable weights, S, for operating the brakes. To each shaft is secured a rope or chain, T, to the free end of which is attached a pulley, T′. To each pulley is secured one pair of the line-wires. The ends of the shafts P are keyed to receive a crank-handle, *p*.

The operation of our machine is as follows: The line-wires are passed around the pulleys T′ of the stretchers so as to arrange the same in pairs, the free ends of each pair being secured to a post. The shafts P are turned by means of the crank-handles, thus winding the ropes or chains T around said shafts and stretching the wires until they are under the desired tension, the friction-brakes R operating to hold the wires under tension and at the same time permit them to be taken up or shortened as they are twisted around the pickets. The wires having been properly stretched, the fence-machine is placed alongside of the same. The twisting-wheels are turned until the slots *n*² in said wheels are coincident with the slots K² in the bearings. One of the wires of each pair is inserted through the slots K² *n*², said arms resting in the annular grooves *n* of the roller-bearings N. The wheels are then turned until the other slot, *n*³, is coincident with the slot K². The other wire of each pair is inserted through the slots K² *n*³ and rest in the annular grooves *n′* of the roller-bearings N′. The machine is then ready for operation. A picket is inserted between the several pairs of line-wires. The crank-handle *g′* is turned to the right or left. Through the bevel pinion and driving sprocket-wheel motion is communicated to the sprocket-chain and the twisting-wheels revolved until the wires have been given the desired twist. The machine is then moved on its truck a suitable distance, another picket inserted, and the operation repeated. It will be noticed that the sprocket-chain is on the inside of all of the twisting-wheels and between them and the main frame. By this arrangement of the sprocket-chain the machine can be removed from the line-wires at any point along the line of the fence without cutting said wires; or any one or more of the twisting-wheels can be removed without interfering with the others or without removing the machine from the line wires. By means of the vertically-adjustable bearing on top of the main frame the sprocket-chain can be tightened or loosened as desired. The twisting-wheels can also be vertically adjusted to any desired point on the frame, and the driving sprocket-wheel can also be vertically adjusted to any desired point on the frame to suit the operator. The slots in the bearings carrying the wheels through which the wires are inserted are in the top of said bearings. This prevents any possibility of the wires slipping out of said slots when the machine is drawn away from the line of the fence, which is sometimes necessary—as, for instance, in passing a post or any obstruction.

Twisting-wheels constructed as we have described, with roller-bearings for the wires, cause but little, if any, friction between said wires and wheels, and the minimum of wear is experienced both on the wires and wheels. This is an important feature of our invention. Rusty wires also readily pass through said wheels, and do not have to be oiled or greased, as is frequently necessary where the wires merely rest in a slot or aperture in the twisters. Said wheels also readily pass a splice in the wires.

Having thus fully described our invention, we claim as new and desire to secure by Letters Patent—

1. In a fence-making machine, a frame, A, provided with a pin, *b*², and carrying a series of twisters and means for rotating the same, in combination with a supporting-truck, B, provided with wheels *b b*, and pivotally secured to the lower part of the frame A, and a brace, B′, pivotally secured at one end to the truck B, and provided on its other end with a series of notches, *b′*, adapted to engage with the pin *b*² on the frame A, all constructed and arranged substantially as shown and described, as and for the purpose set forth.

2. In a fence-making machine, the combination of a frame provided with sprocket-wheels on its upper and lower ends, a vertically-adjustable bracket secured to the frame, a driv-

ing sprocket-wheel mounted in said bracket, a series of twisting-wheels mounted in bearings secured to the frame and provided with spur-teeth, and an endless sprocket-chain passing around the frame, over the driving sprocket-wheel and sprocket-wheels at the top and bottom of the frame, and on the inside of all of the twisting-wheels, between the same and the frame, the spur-teeth of said twisting-wheels engaging with said sprocket-chain, all constructed, arranged, and operating substantially as shown and described.

3. In a fence-making machine, a twisting-wheel having a central opening and two diametrically-opposite slots extending from said opening to the periphery of the wheel, in combination with two roller-bearings mounted in the central opening and provided with annular grooves in their peripheries, the groove in one bearing being coincident and communicating with one slot, and the groove in the other bearing being coincident and communicating with the other slot, substantially as shown and described.

4. In a fence-making machine, a twisting-wheel, L, having a central opening, M, and two diametrically-opposite slots, n^2 n^3, extending from said opening to the periphery of the wheel, in combination with the frame M′, secured in the opening M, and having the spindle m, and roller-bearings N N′, mounted on said spindle and provided with annular grooves n n' in their peripheries, the groove n being coincident and communicating with the slot n^2, and the groove n' being coincident and communicating with the slot n^3, all constructed, arranged, and operating substantially as shown and described.

5. In a fence-making machine, a main frame, a sprocket chain mounted on said frame, and means for operating the same, circular bearings I, secured to the frame and composed of two similarly-formed circular parts, I′ I², having an opening, i, between the same, and slots K² in the top of said bearing for the insertion of the wires, in combination with the twisting-wheels L, mounted in the bearings I, and having spur-teeth L′, which project through the opening i and engage with the sprocket-chain, and provided with diametrically-opposite slots n^2 n^3, and roller-bearings N N′, having annular grooves in their peripheries, the groove in the bearing N being coincident with the slot n^2, and the groove in bearing N′ being coincident with the slot n^3, all constructed, arranged, and operating substantially as shown and described.

6. In a fence-making machine, a circular bearing secured to a suitable frame and provided with a peripheral slot for the insertion of the wires, in combination with a twisting-wheel mounted in said bearing and having a central opening, and two diametrically-opposite slots extending from the opening to the periphery of the wheel, and two roller-bearings mounted in the central opening and provided with annular grooves in their peripheries, the groove in one bearing being coincident and communicating with one slot, and the groove in the other bearing being coincident and communicating with the other slot, all constructed, arranged, and operating substantially as shown and described.

7. In a fence-making machine, the combination of a main frame composed of two standards, A′ A², and cross-pieces a a, having an opening, a', between said standards, sprocket-wheels E C′, mounted, respectively, on the top and bottom of the frame, a bracket, F, carrying a driving sprocket-wheel, G, bearings I, composed of two parts, I′ I², having an opening, i, between the same, and provided with arms K K′, engaging with and secured to the main frame, an endless sprocket-chain, H, passing around the frame, over the sprocket-wheels C′, E, and G, and between the arms K K′, and the twisting-wheels L, mounted in the bearings I and provided with spur-teeth L′, projecting through the opening i and engaging with the sprocket-chain H, all constructed, arranged, and operating substantially as shown and described.

8. The combination, with the wire-twisting mechanism herein described, of the wire-stretcher having the uprights O² O², the rotatable shafts P, mounted in the uprights O² O² and having the ropes or chains secured thereto and provided with pulleys T′, over which the wires are passed, the friction-wheels P′, rigidly mounted on the shafts P, and the friction brake-levers R, having the weights S and engaging with the friction-wheels P′, all constructed, arranged, and operating substantially as shown and described.

9. In a device for stretching the line-wires of a combined wire-and-picket fence, a frame having uprights O² O², rotatable shafts P, mounted in the uprights O² O² and having the ropes or chains T secured thereto, and provided with pulleys T′, over which the wires are passed, and having the friction-wheels P′, in combination with the friction-brake-levers R, having the weights S and engaging with the friction-wheels P′, all constructed, arranged, and operating substantially as shown and described.

In testimony whereof we affix our signatures in presence of two witnesses.

FRANCIS VAN DOREN.
LOYAL LOVEJOY.

Witnesses:
R. B. ROBBINS,
J. P. GREENE.