

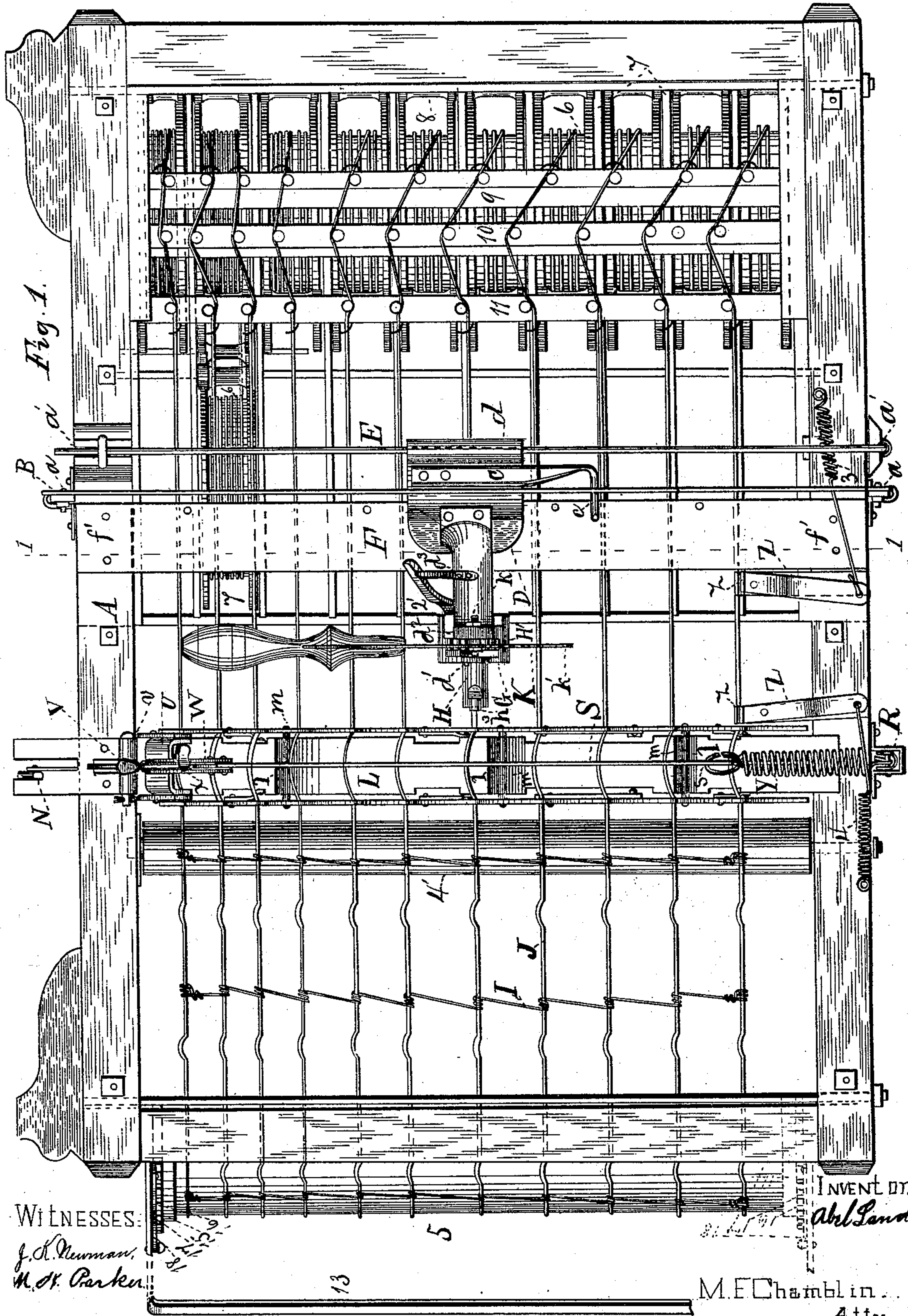
(No Model.)

5 Sheets—Sheet 1.

A. LAND.
WIRE FENCE MACHINE.

No. 455,406.

Patented July 7, 1891.



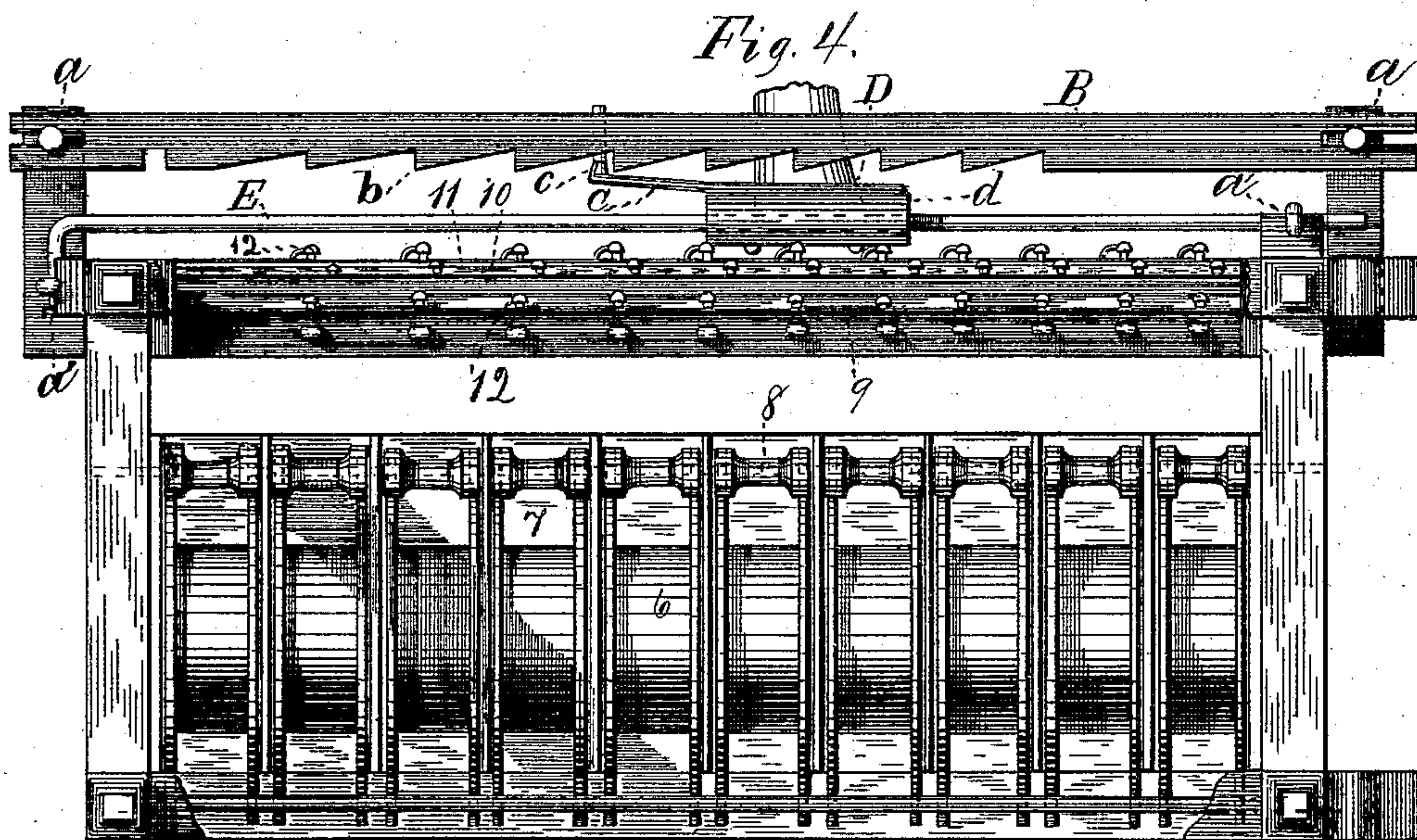
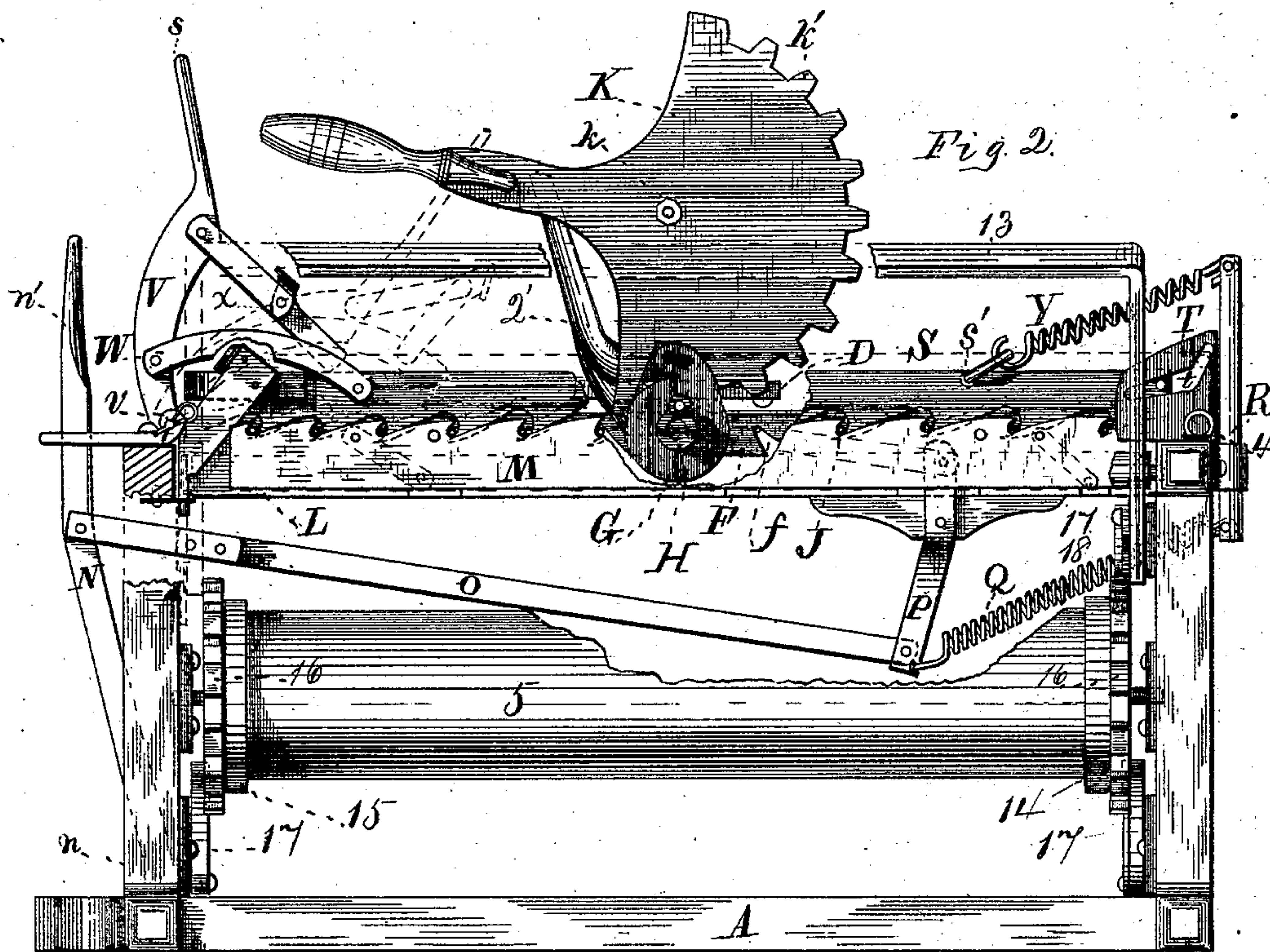
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Witnesses:
J. H. Newman.
M. H. Parker.

Inventor.
Abel Land.

M. F. Chamblin.
Atty.

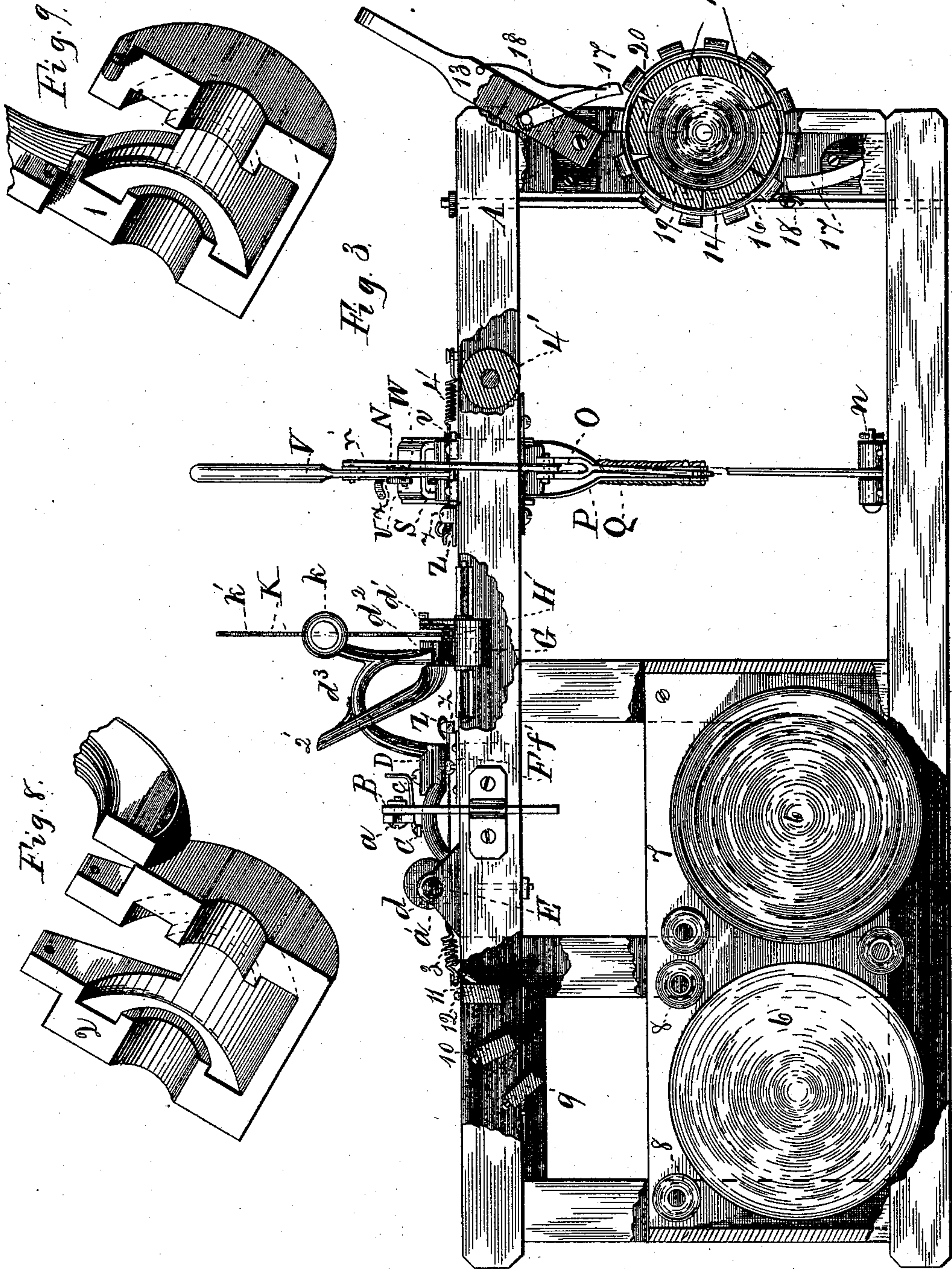
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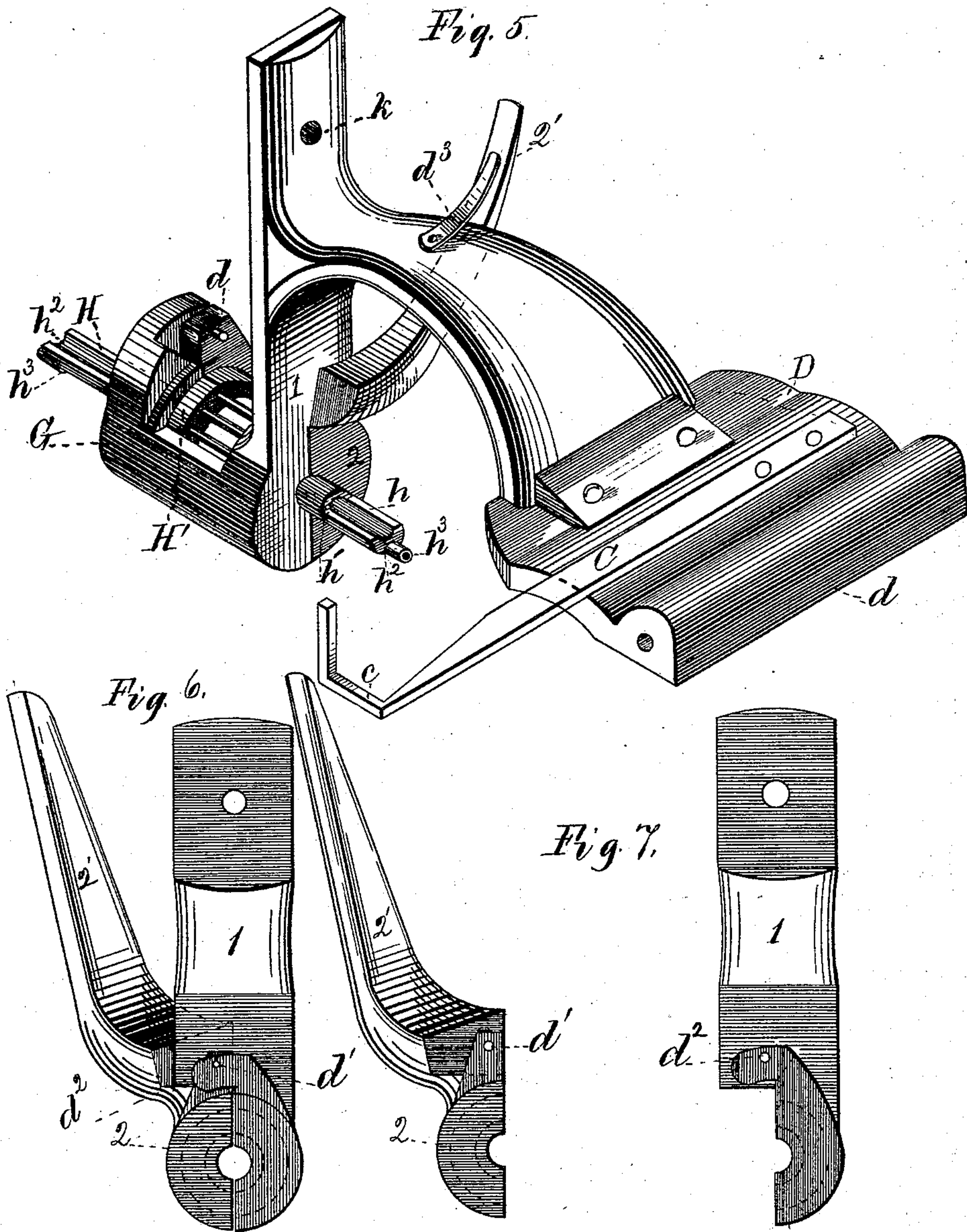
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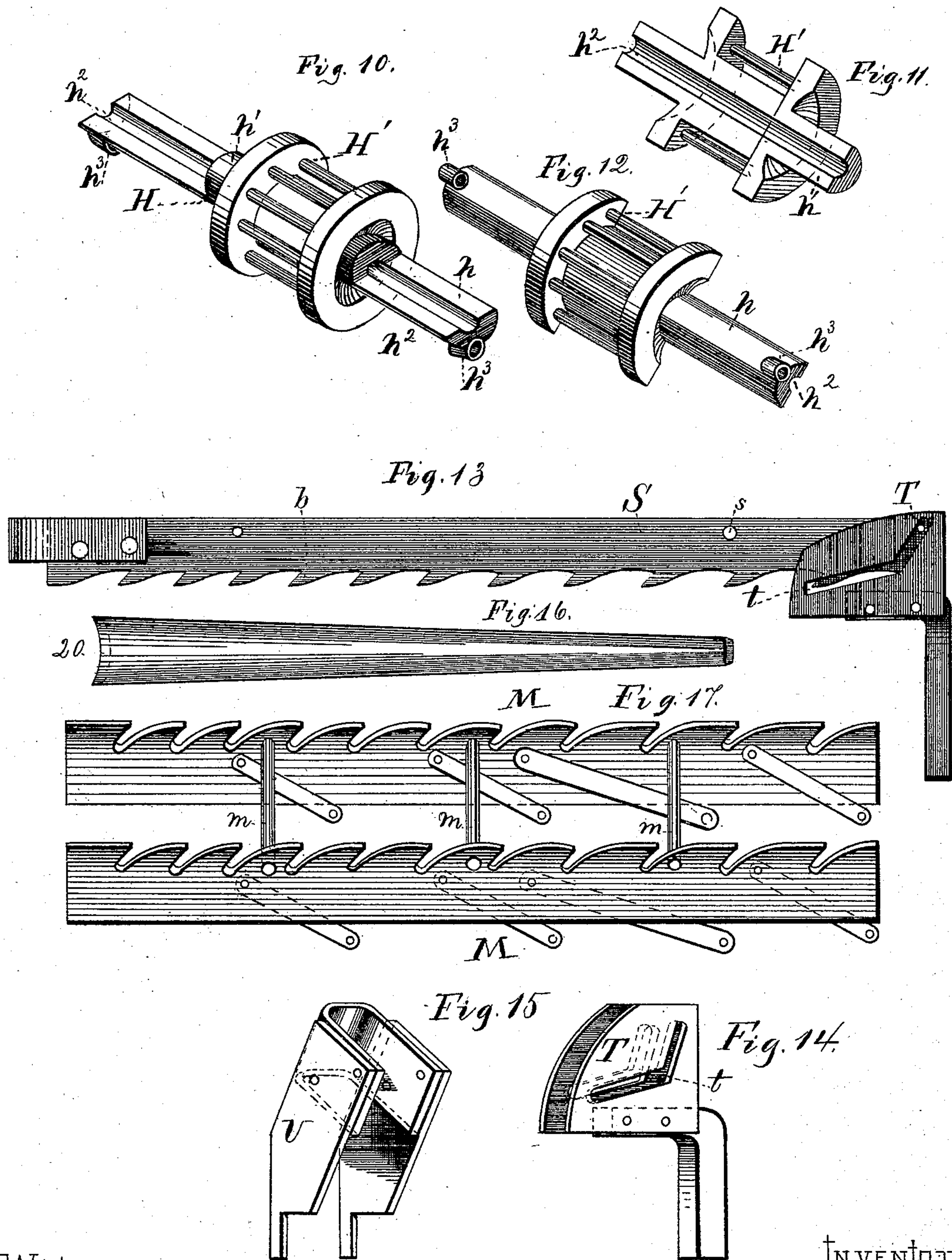
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UNITED STATES PATENT OFFICE.

ABEL LAND, OF HUDSON, MICHIGAN.

WIRE-FENCE MACHINE.

SPECIFICATION forming part of Letters Patent No. 455,406, dated July 7, 1891.

Application filed January 15, 1891. Serial No. 377,822. (No model.)

To all whom it may concern:

Be it known that I, ABEL LAND, a citizen of the United States, residing at Hudson, in the county of Lenawee and State of Michigan, have invented certain new and useful Improvements in Wire-Fence Machines; and I 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.

My invention relates to a wire-fence machine; and the object of my invention is, first, to provide a machine that is thoroughly effective and practical in operation, and, second, to provide a machine that will manufacture a wire fence having the horizontal wires crimped and alternately wrapped from opposite sides by vertical wires extending the width of the fence. In other words, the machine manufactures the same fence for which I have obtained Letters Patent No. 444,364, dated January 6, 1891. I attain said objects by a certain construction, combination, and arrangement of parts fully described in this specification and illustrated in the accompanying drawings, in which—

Figure 1 is a plan view of the machine complete, having the wire in same and in a position for use. Fig. 2 is a partly-broken view of the front portion of the machine in sectional elevation, taken on the line 1 1 of Fig. 1. Fig. 3 is a side elevation of the machine, portions being broken away or shown in section to indicate the construction more definitely. Fig. 4 is a partly-broken view of the rear portion of the machine in sectional elevation, taken on line 1 1 of Fig. 1. Fig. 5 is a perspective view of the sliding frame of the machine that carries the vertical or woof wire with the needle in position. Figs. 6, 7, 8, and 9 are detail perspective views of sections of the journal-box of the frame that carries the needle which strings the vertical wires upon the horizontal wires. Figs. 10, 11, and 12 are detail views of said needle. Figs. 13 and 17 are detail views of the crimping-bars and their mechanism detached from the machine. Fig. 14 is a detail view of the crimping-bar casing. Fig. 15 is a detail view of the guiding-cap of the upper crimp-

ing-bar S. Fig. 16 is a detail view of the stave 20.

The mechanism of my invention is arranged and mounted in a suitably-constructed frame A. Upon the top of this frame and near the center there is a bar B, having bearings *a* and upon its under side the angular teeth *b*, which engage the portion *c* of the horizontal rod C, which is secured to the top of the sliding frame D. Said rod is elastic and can be sprung down with a view of preventing the same from engaging the angular teeth *b* of the bar B in the movement of the frame D from one horizontal wire to another. It is well to mention the fact that the portion *c* of the rod C, when engaged by the teeth *b*, holds the sliding frame D rigidly in place while the vertical or woof wire I is being secured around the horizontal wire.

About one inch to the rear of the bar B there is located in suitable bearings *a'* upon the top side of the frame A the rod E, which is journaled through the rear portion *d* of the sliding frame D and answers the purpose of a bearing which guides the frame D in its horizontal movement.

Slightly in front of the rod E, upon the top of the frame A, there is also located a bar F, upon which the sliding frame D is supported and moves. This bar F, having bearings *f'*, is provided with orifices *f* upon its under side, through which the warp or horizontal wires J pass, and by means of which said wires are securely held in their normal position. The sliding frame D is constructed as shown in Figs. 5, 6, and 7. The novel and unique feature of this sliding frame for the purpose designed consists of the divided journal-box G, which carries the needle H. It will be observed in Fig. 5 that said journal-box is closed and contains the needle H in its normal position. Fig. 6 represents an end view of the journal-box closed with the needle detached, and Fig. 7 shows detail views of the two parts which constitute the same and in a position to be pivoted to each other. These illustrations show that this journal-box of the frame D is composed of two parts 1 and 2, respectively. The portion 1 constitutes a part of the frame D, and the portion 2 is distinct therefrom and pivoted to the portion 1 at *d'*

and d^2 . It will be readily seen that the portion 2 is operated by the handle or lever 2' and that this lever is held in position by the elastic spring d^3 . The longitudinally-divided needle H, Figs. 10, 11, and 12, works or rotates in said divided journal-box G and is provided in the center with the pinion H'. It is noticeable that said needle comprises two parts h and h' , respectively, and contains a cavity h^2 , in which is placed the warp-wire. The part h of said needle is longer than the portion h' , and is provided with the eyes h^3 upon each end, through which the vertical or woof wires I are threaded. This feature enables said needle to string two woof-wires at the same time at intervals upon the warp-wire, and the distance apart can always be regulated by the relative length of the portion h of the needle. This is one of the novel and valuable features of my invention. The divided needle and journal-box are also particularly novel and practical for the reason that the warp or horizontal wires J can be readily located in the cavity h^2 of the needle and as quickly extricated simply by the operation of the lever 2'. It will also be readily seen that the needle H, being divided, as illustrated and described, enables the operator to string the woof or vertical wire I from the same or from alternately-opposite sides of the warp-wire, the latter operation providing a fence of superior and novel merits, the same as described and claimed by me in my Letters Patent No. 444,364, dated January 6, 1891, to which I have heretofore referred.

K designates the spur-lever, Fig. 2, which is pivoted to or mounted upon the sliding frame D at k . Said lever operates the needle H by means of the spurs k' upon the periphery thereof engaging or coming in contact with the pinion H'.

L represents a beam that extends horizontally across the top of the frame A. Upon the top surface of this beam there are reduced portions l , Fig. 1, wherein the braces m rest and work, which braces hold the angular toothed crimping-bars M M upon each side of the beam L. These crimping-bars are elevated and lowered by means of the lever N, which is pivoted at n to one of the lower longitudinal beams of the frame A. Near the center of lever N there is pivoted a lever O, which extends horizontally to the lower end of the vertical lever P and is pivoted thereto. The upper end of the lever P extends upward and is bifurcated or U-shaped, so as to come in contact with the crimping-bars M M, to which the same is secured.

Q indicates a spiral spring which is secured to the post R and extends thence across to the interception of the levers O and P, where it is connected to them. By operating horizontally the handle n' of the lever N the crimping-bars M M are raised and lowered.

S is a co-operating angular toothed crimping-bar, which assumes in operation the opposite direction of the crimping-bars M M, and by

means of which and in connection with the bars M M the crimps are made in the warp-wires J. One of the ends of the crimping-bar S works in a slot t of the casing T upon the top of the frame A. The other end of said bar works in the guiding-cap U, which fits over the end of the beam L and between the sides of the same and the crimping-bars M M. The crimping-bar S is operated by means of the lever V, which is pivoted to the frame A of the machine at v . The lever V is connected to the crimping-bar S by means of the circular-shaped slotted lever W and also the toggle joint x . Hence it will be observed that by oscillating the lever V the crimping-bar S is operated, which can be moved to and fro, as the dotted lines in Fig. 2 indicate. When this lever is at s , the toggle-joint is straightened and will hold it in this position until slackened.

Y is a spiral spring, which causes the crimping-bar S to fly back to its normal position when slackened. This spiral spring is secured to the top of the post R and extends across and connects with the crimping-bar S at s' . It will be seen that the crimps in the warp-wires J are made by means of the alternately-reciprocating movement of the crimping-bars M M in connection with the bar S, by means of which the angular teeth of said bars engage simultaneously the wires and force the same in opposite directions.

Z Z represent two pinchers or clamps, which are provided with the upwardly-curved jaws z , by which the ends of the woof-wires I are secured and held while the same are being woven across the warp-wires J. The jaws of said pinchers are held firmly in position and enabled to clasp the wire securely, owing to the spiral springs 3 and 4, which are located upon the top of the frame A and connected to the movable lever of said pinchers or clamps.

The number 4' indicates a roller, which has bearings in the sides of the frame A. This roller assists in carrying the fence when manufactured to the take-up cylinder 5. This taking-up cylinder has bearings in the sides of the front posts of the frame A and is operated by means of the lever 13, which is pivoted to the inner side of the said front posts. Around each end of this cylinder there are two bands 14 and 15, having the notches 16, whereby the pawls or ratchets 17 (which are operated by the springs 18) engage said cylinder at every point and prevent the same from running backward when taking up the completed article of wire fence. A very important feature of this cylinder is that the same is composed of the inwardly-beveled-edge staves 19 and the outwardly-beveled-edge and wedge-shaped stave 20, which can be inserted or drawn out after removing the band 14. As all the other staves composing this cylinder are beveled inwardly upon their side edges, when the stave 20 is forced into its normal position it will compress the staves 19 closely

together and hold them rigidly in position. To remove the fence, when manufactured, from this cylinder, all that is necessary is to remove the band 14 and draw out the stave 20. This will cause the staves 19 to fall in, and when removed the wire fence is rolled and ready for shipment.

The spools upon which the warp-wires are placed to be fed into the machine are designated by the number 6. These spools are provided with suitable bearings and are located in the racks 7. Near the top and over these there is arranged a series of small rollers 8, which assist the wire upon the supporting-bars 9, 10, and 11. These bars have bearings in the sides of the frame A, and they are arranged one above the other, thereby affording a series of steps whereby the warp-wire is elevated upon the plane of the manufacturing mechanism of my machine. Upon the top of the said supporting-bars there is provided any suitably-constructed clutching mechanism for holding securely in position the warp-wires while the same are being fed into the machine. This may be a series of clutches 12, which are arranged alternately and at varying intervals upon the top of the bars 9, 10, and 11, or they may be the equivalent of the clutches described and claimed in the feeding-cylinder for which I obtained Letters Patent No. 435,042, dated August 26, 1890.

What I claim, is—

1. In a wire-fence machine, the combination, with any suitable frame, of the bar B, having bearings *a* and provided upon its under side with angular teeth, the sliding frame D, located and working horizontally upon the bar F, the rod E, having bearings upon the top of the frame of the machine and journaled through the rear portion of said sliding frame, the bar F, having bearings *f'* and provided upon its under side with suitable orifices, the spur-lever K, pivoted or mounted upon the front end of the sliding frame D, the beam L, extending horizontally across the frame of the machine and having at intervals the reduced portion *l*, the angular toothed crimping-bars M M, located upon each side of said beam, the mechanism whereby the crimping-bars M M are simultaneously operated, the co-operating crimping-bar S, having bearings in the casing T and the guiding-cap U upon the top of the frame of the machine, the mechanism whereby the crimping-bar S is operated, the clamps Z, which secure the ends of the woof-wire, the roller 4', having bearings in the frame A, the taking-up cylinder 5, having bearings in the sides of the front posts of the frame A, the spools 6, located in the rear end of the frame of the machine, and the supporting-bars 9, 10, and 11, provided with a suitable clutching mechanism and located in the top portion of the frame A and over the spools 6, all substantially as described, and for the purpose set forth.

2. In combination with the co-operating mechanism of a wire-fence machine, the needle H, comprising the portions *h* and *h'*, the portion *h* having at each end an eye through which the woof-wires are threaded, substantially as described, and for the purpose set forth.

3. In combination with the co-operating mechanism of a wire-fence machine, a longitudinally-divided needle H, adapted to hold the warp-wire while stringing the woof-wire upon the same and provided upon each end with an eye through which the woof-wire is threaded, the said needle being supported to rotate in its bearings, substantially as described.

4. In combination with the co-operating mechanism of a wire-fence machine, the sliding frame D, having the rod E, journaled through the rear portion *d* of said frame, and provided in front with the divided journal-box G, comprising the parts 1 and 2, which are pivoted to each other, the part 2 being provided with a suitable leverage mechanism for operating the same, substantially as described, and for the purpose set forth.

5. In a wire-fence machine, the combination of the spur-lever K, pivoted at *k* to the sliding frame D, the sliding frame D, having the divided journal-box G, which comprises the parts 1 and 2, which are pivoted to each other, and the longitudinally-divided needle H, located and rotating in said journal-box, substantially as described and set forth.

6. In combination with the co-operating mechanism of a wire-fence machine, the beam L, extending horizontally across the frame of the machine and having upon its top surface the reduced portions *l*, the angular toothed crimping-bars M M, located upon each side of said beam, the mechanism whereby said crimping-bars are simultaneously operated, the co-operating crimping-bar S, having suitable bearings in the cap U and the casing T, whereby the same co-operates with the crimping bars M M, as described, and the mechanism whereby the crimping-bar S is operated, substantially as set forth.

7. In combination with the co-operating mechanism of a wire-fence machine, the beam L, extending horizontally across the frame of the machine and having upon its top surface the reduced portions *l*, the angular toothed crimping-bars M M, located upon each side of said beam, the mechanism whereby said crimping-bars are simultaneously operated, and the crimping-bar S, located above and co-operating with said bars, substantially as set forth.

In testimony whereof I affix my signature in presence of two witnesses.

ABEL LAND.

Witnesses:

GRANT FELLOWS,
BERT D. CHANDLER.