

(No Model.)

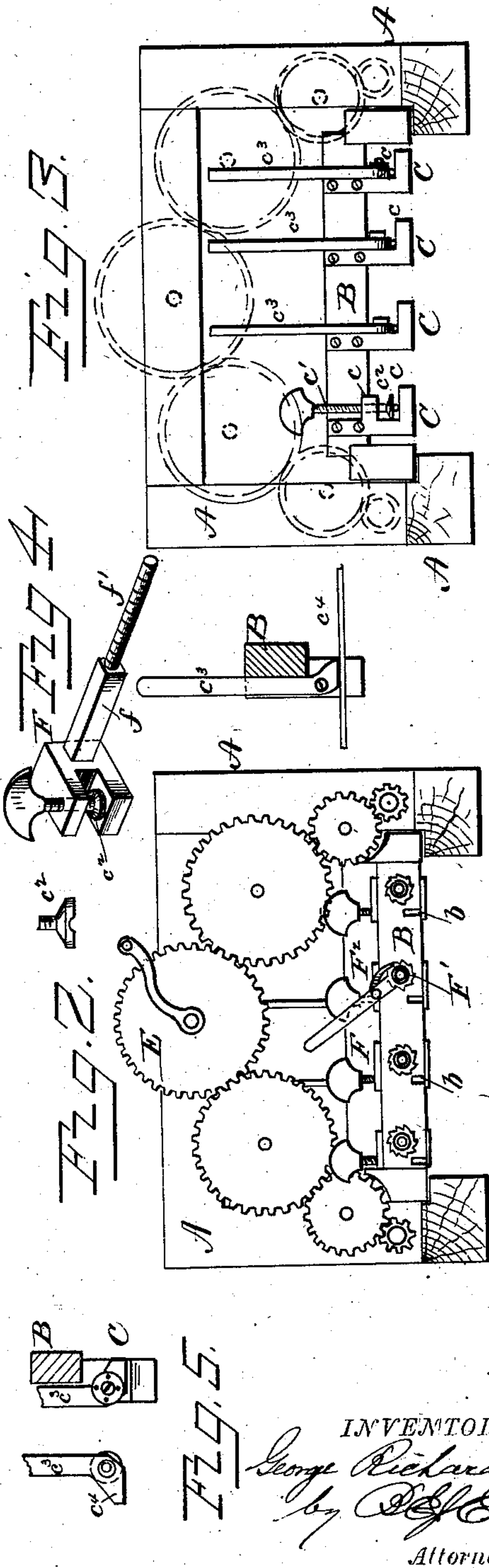
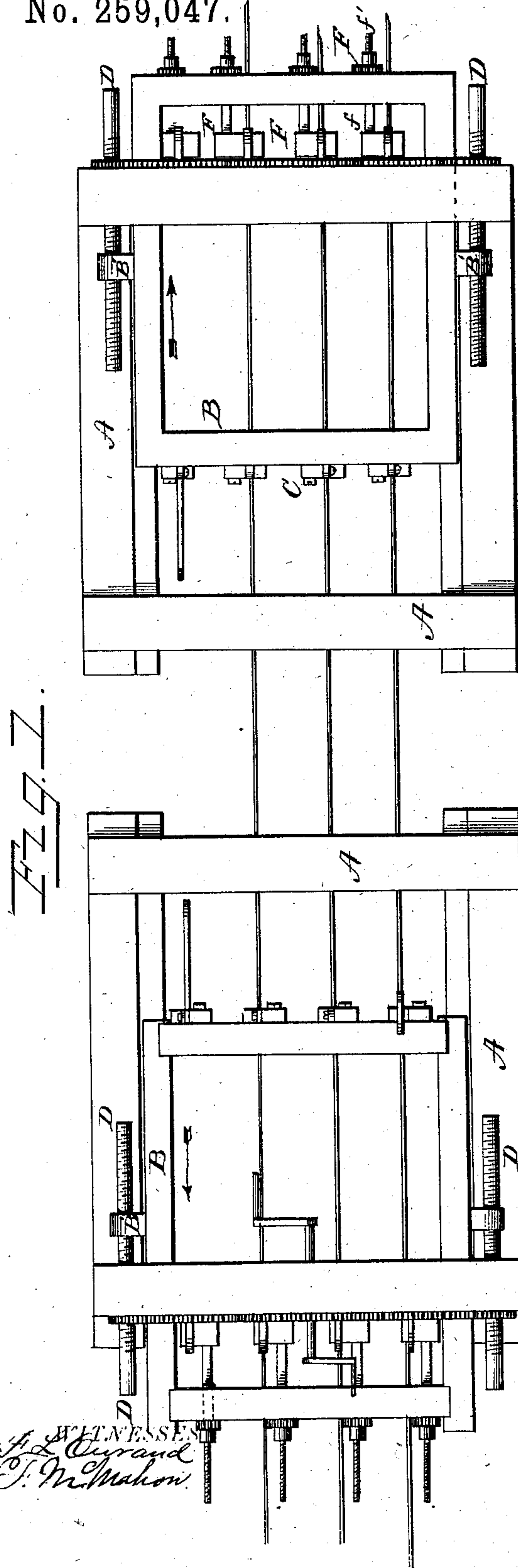
3 Sheets—Sheet 1.

G. RICHARDSON.

WIRE STRETCHING APPARATUS.

No. 259,047.

Patented June 6, 1882.



WITNESSES  
J. L. Curran  
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(No Model.)

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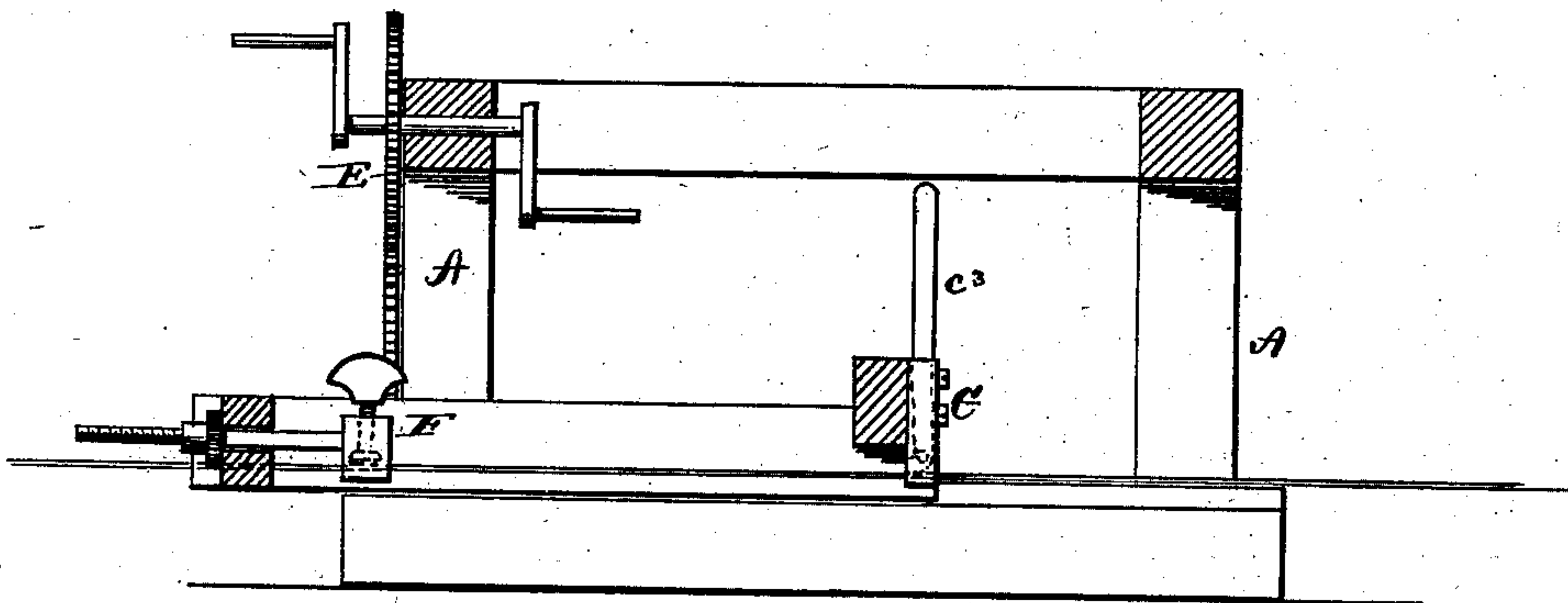
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*Fig. 6.*



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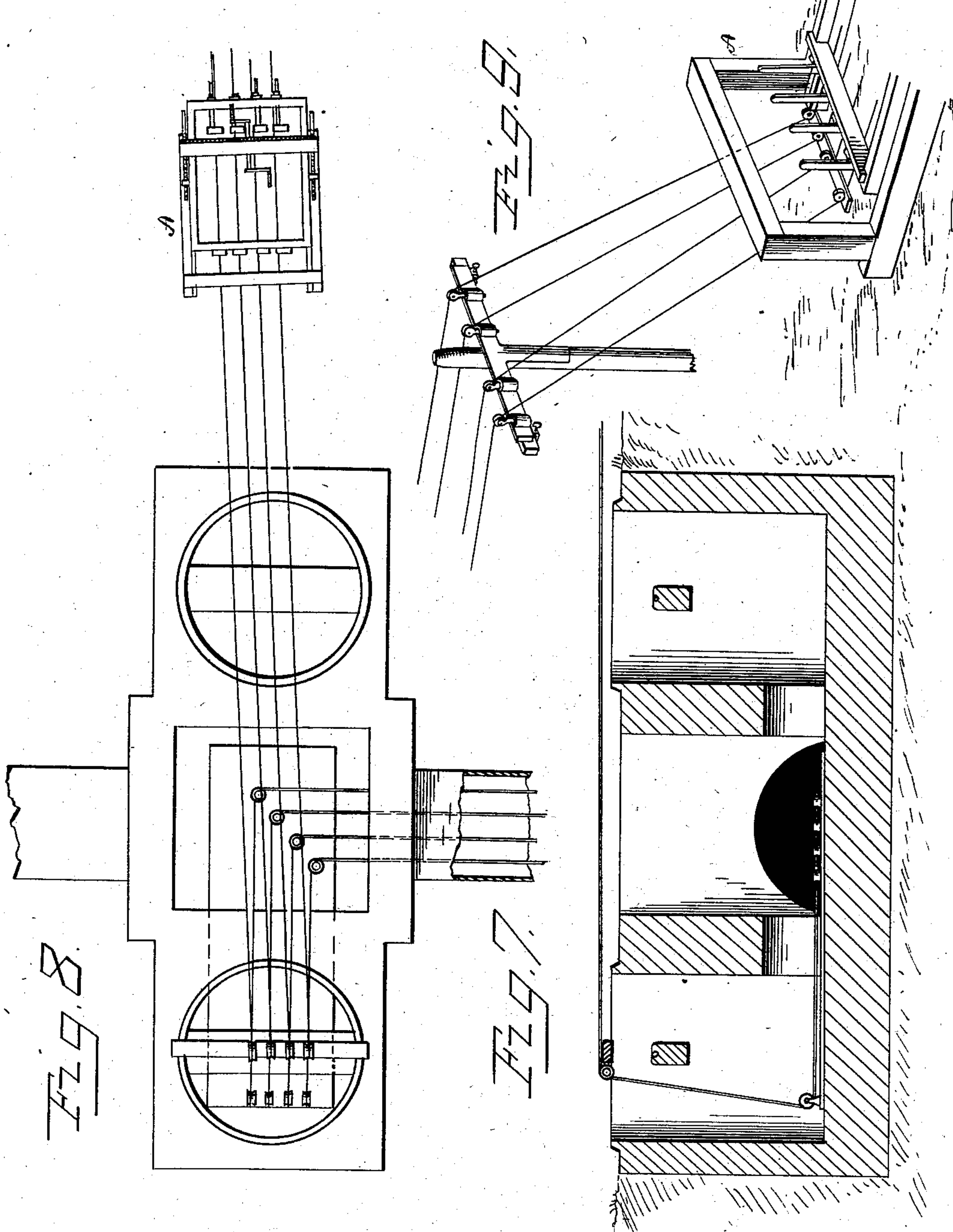
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# UNITED STATES PATENT OFFICE.

GEORGE RICHARDSON, OF PHILADELPHIA, PENNSYLVANIA.

## WIRE-STRETCHING APPARATUS.

SPECIFICATION forming part of Letters Patent No. 259,047, dated June 6, 1882.

Application filed April 13, 1882. (No model.)

*To all whom it may concern:*

Be it known that I, GEORGE RICHARDSON, a citizen of the United States, residing at Philadelphia, in the county of Philadelphia and State of Pennsylvania, have invented certain new and useful Improvements in Electric-Wire-Stretching Apparatus; 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.

The object of this invention is to provide a machine for stretching telegraph or other wires, adapted to stretch a group of wires collectively, as well as individually, at any point of the length of such wire or wires.

To this end the invention consists of certain combinations of mechanical devices, which combinations are clearly pointed out in the claims at the close of this specification.

In order that my invention may be clearly understood, I have illustrated in the annexed drawings and will proceed to describe the best form of a machine at present known to me, and the various modes of using such machine.

In the annexed drawings, Figure 1 is a plan view, showing two of my improved stretching-machines operating on a group of wires. Fig. 2 is an end view of the machine, showing that end where the power is applied. Fig. 3 is an end view showing the opposite end of the machine. Figs. 4 and 5 illustrate details of the machine. Fig. 6 is a vertical longitudinal section of the machine. Figs. 7 and 8 illustrate the mode of using my machine for stretching a group of underground wires from the surface of the ground. Fig. 9 illustrates the use of my machine for stretching a group of telegraph-wires strung on poles from the ground.

The same letters of reference are used in all the figures to designate identical parts.

The operative parts of the machine are mounted on a substantial frame-work, A, which may be of the rectangular form shown.

A sliding sash, B, is fitted on longitudinal rails or ways of the main frame. One end of this sash is provided with a series of fixed clamps, C, so constructed that they can grasp a wire at any point of its length. To this end the clamps consist essentially of a pair of jaws, one of which is preferably made stationary, while the other one is movable. I

have shown several forms of such clamps, one form consisting of a bracket constructed with two laterally-projecting flanges, *c c*, (see Fig. 3,) the upper flange of which carries a clamp-screw, *c'*, terminating at its lower end in a foot, *c<sup>2</sup>*, adapted to press a wire forcibly against the lower flange *c*. The lower flange *c* forms the stationary jaw, and the screw *c'* forms the movable jaw, of the clamp. In the other forms the flange *c* forms the stationary jaw, as before, while the movable jaw consists of a hand-lever, *c<sup>3</sup>*, constructed with an eccentric head or short foot, *c<sup>4</sup>*, for pressing on the wire as the lever is turned. The hand-lever *c<sup>3</sup>* may be fulcrumed on an adjustable pin, in order that the clamp can be adjusted to operate on different sizes of wire. All these clamps C may be so mounted on the end beam of the sash B that they can be adjusted toward and from each other as occasion may require. A nut, B', is affixed to each side of the sash B, at about its mid-length, for receiving the screw D, which is swivelingly connected to the main frame A, so that it may turn in its bearing on the main frame, but cannot move endwise therein. The sash is moved by the operation of the screws D D, which may, to that end, be turned by separate winches applied to them. I prefer, however, to operate the screws simultaneously through a train of gearing, one form of which is shown in the drawings, the power being applied to the main wheel E at the center of the machine and transmitted through intermediate wheels to the screws at the respective sides of the sash B.

The machine so far described is capable of being applied to a group of wires at any point along their length, and to stretch the wires collectively.

In a group of wires some will bear and require more stretching than others; and in order to provide for the stretching of individual wires of a group, after all the wires of the group have been stretched collectively, I arrange another series of clamps, F, on the sash B, in line with the fixed clamps C, and preferably on the other end of the sash. These clamps F are independently movable on the sash B, and may be constructed as shown in Fig. 4, each clamp F being provided with a preferably square shank, *f*, adapted to slide endwise through a bearing in the sash, and terminating in a screw-threaded



rod or stem,  $f'$ , which receives a nut,  $F'$ , applied upon the outer side of the end bar of the sash, as shown. The nut is constructed with ratchet-teeth, in order that it may be turned  
 5 by a hand-lever and pawl, as shown in Fig. 2, for the purpose of moving the clamp  $F$  outwardly to stretch the wire grasped by it.

In the drawings I have shown as many movable clamps  $F$  as there are fixed clamps  $C$ ; but  
 10 that is not essential. One clamp  $F$  could be used for stretching the individual wires successively, either by so mounting such clamp that it could be moved on the sash successively from one wire to the next, or by successively  
 15 applying the clamp at different points to the sash.

It is also obvious that when a series of clamps  $F$  are used the clamps  $C$  might be wholly dispensed with, although I prefer to use a series  
 20 of fixed clamps,  $C$ , and one or more movable clamps,  $F$ , because in some cases it will probably be necessary to stretch an individual wire through a greater distance than the length of  
 25 motion of a movable clamp, in which case such clamp will have to be hitched onto such wire several times, and unless there was a second or fixed clamp the wire could not be held conveniently at times of shifting the movable  
 30 clamp preparatory to the further stretching of the wire.

Below the sash  $B$  the frame  $A$  must be unobstructed transversely, so that the machine can be placed over a row of wires, permitting  
 35 such wires to be introduced into their respective clamps. In case the clamps  $F$  are constructed as shown, so as to bring the jaws on a line above the lower edge of the adjacent cross-bar of the sash, slots or notches  $b$  should  
 40 be cut in such cross-bar, as indicated in Figs. 2 and 6, to admit of the passage of the wires to be stretched.

In applying this machine it is placed directly over a line of wires, which are then clamped  
 45 respectively by the fixed clamps  $C$ , after which the sash may be drawn in the direction of the arrow to stretch the wires to the required extent as a group. The wires in which there is  
 50 still some slack are then attached to the movable clamps  $F$ , by which such slack is then taken up.

In case the machine has to be operated on a level different from that in which the wires are  
 55 located, or where the machine has to be operated at an angle to the direction of the wires, such wires will either be led to the machine by

suitable guide-pulleys, as shown in the drawings, Figs. 7, 8, and 9, or else the wires may be taken hold of by clamps on ropes or chains led to the machine by such guide-pulleys.

The apparatus is to be suitably fastened  
 60 down by stakes, or wedges, or ropes, as occasion may require. If used in a man-hole of an underground conduit, it needs simply to abut against the side of such man-hole. Before  
 65 clamping the wires, preparatory to stretching them by the apparatus, they are to be drawn as taut as possible by hand. Should the length of motion of the sash be insufficient to stretch  
 70 the wires to the full extent, each wire can be stretched individually by the independently-movable clamps until perfectly taut. After all  
 75 the wires have been stretched to the fullest extent they will be fastened in any ordinary or suitable manner and the stretching apparatus removed.

Having thus described my invention, what I claim is—

1. The combination, substantially as set forth, of a frame, the sliding sash, and a series of clamps, each composed of a pair of jaws  
 80 adapted to grasp a wire sidewise at any point of its length.
- \* 2. The combination, substantially as before set forth, of a frame, the sliding sash, and an  
 85 independently-movable clamp composed of a pair of jaws adapted to grasp a wire sidewise at any point of its length.
3. The combination, substantially as before set forth, of a frame, the sliding sash, a fixed  
 90 clamp, and an independently-movable clamp, both clamps being adapted to grasp a wire sidewise at any point of its length.
4. The combination, substantially as before set forth, of a frame, the sliding sash, an  
 95 independently-movable clamp constructed with a screw-threaded rod or stem, and a nut on said screw-threaded rod.
5. The combination, substantially as before set forth, of a frame, the sliding sash, a series  
 100 of fixed clamps, and a series of independently-movable clamps, all the clamps being adapted to grasp wires sidewise at any point of their length.

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

GEORGE RICHARDSON.

Witnesses:

C. A. NEALE,  
 B. E. J. EILS.