3 Sheets—Sheet 1.

J. S. WINSOR.

Wire-Drawing Machine.

No. 196,963. Patented Nov. 6, 1877.

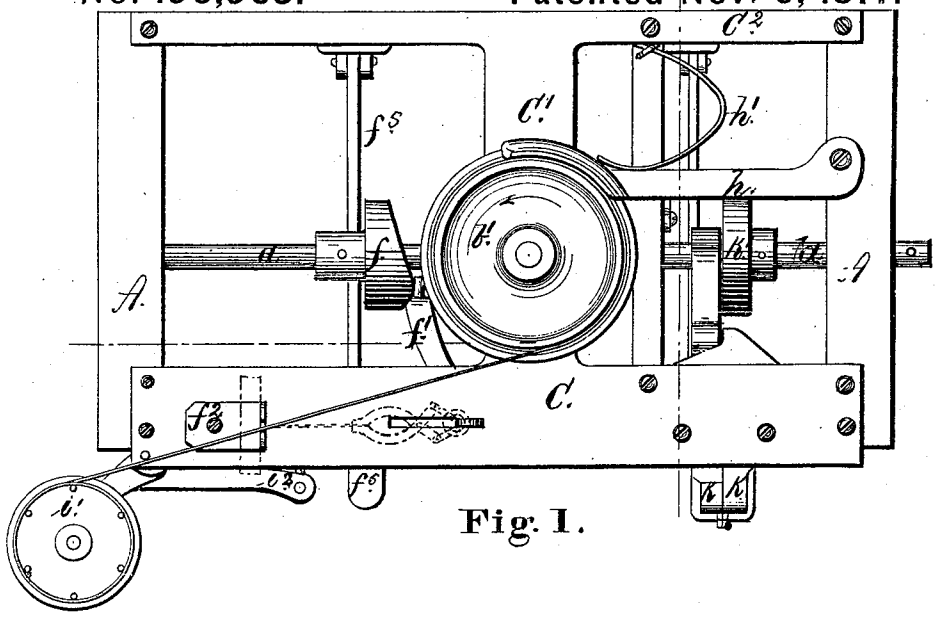
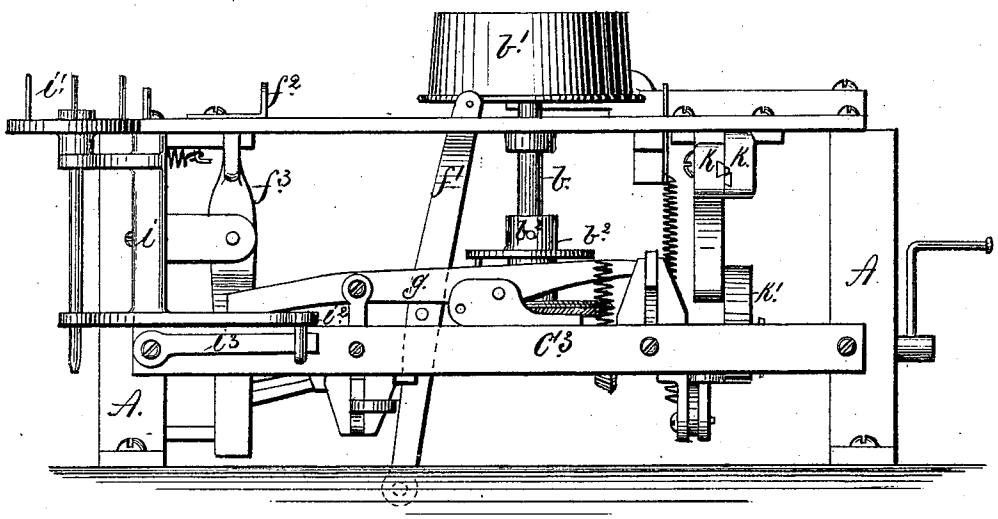


Fig. 1.

Fig. 2.



WITNESSES.

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3 Sheets—Sheet 2.

J. S. WINSOR.

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Fig. 3.

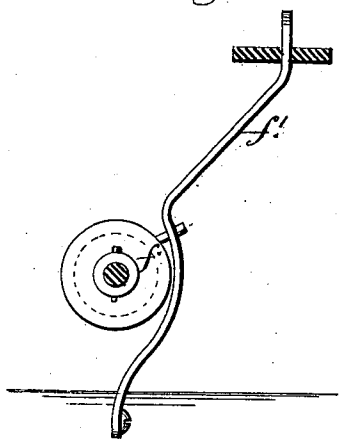


Fig. 4.

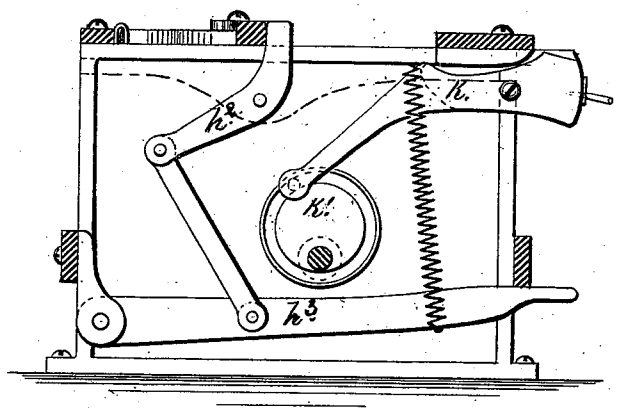


Fig. 5.

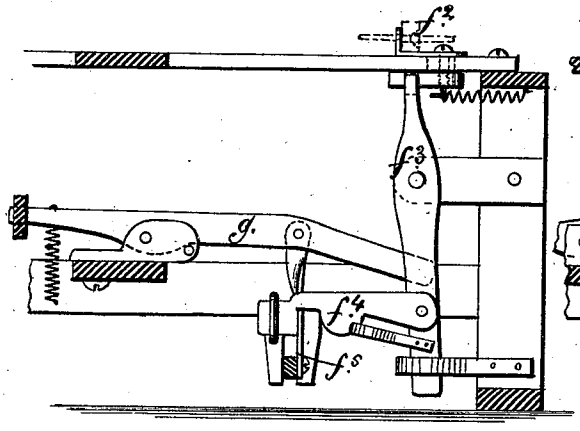
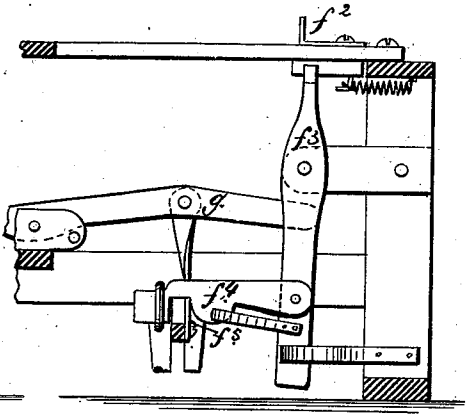


Fig. 6.



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3 Sheets—Sheet 3.

J. S. WINSOR.

Wire-Drawing Machine.

No. 196,963. Patented Nov. 6, 1877.

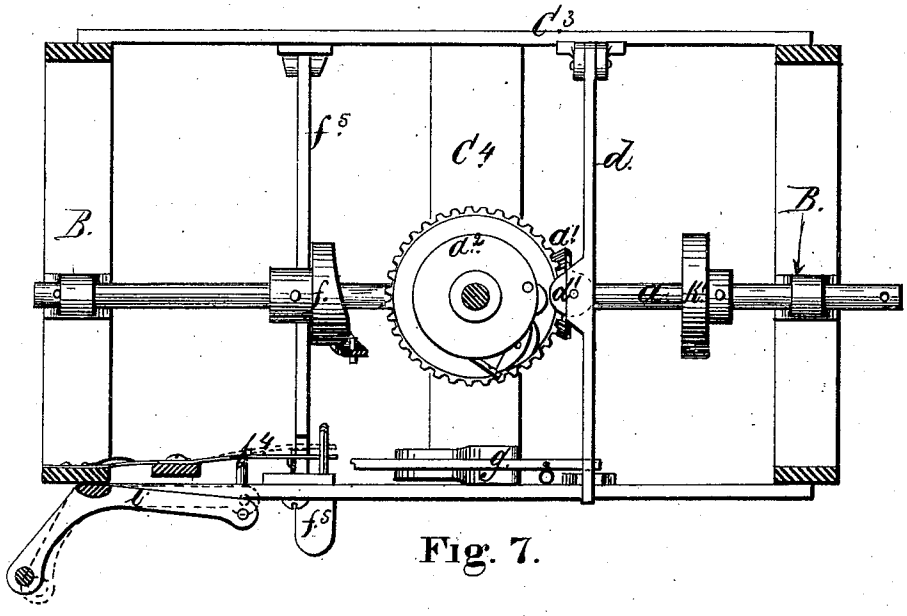


Fig. 7.

Fig. 8.

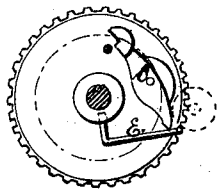
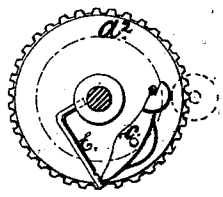


Fig. 9.



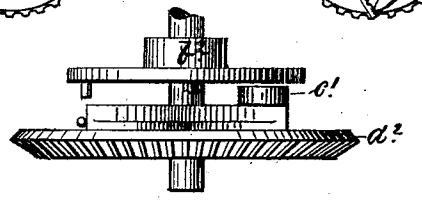


Fig. 10.

WITNESSES.

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UNITED STATES PATENT OFFICE.

JOSEPH S. WINSOR, OF PROVIDENCE, RHODE ISLAND.

IMPROVEMENT IN WIRE-DRAWING MACHINES.

Specification forming part of Letters Patent No. **196,963,** dated November 6, 1877; application filed August 10, 1877.

To all whom it may concern:

Be it known that I, JOSEPH S. WINSOR, of the city and county of Providence, and State of Rhode Island, have invented new and useful Improvements in Wire-Drawing Machines; and I hereby declare that the following is a full, clear, and exact description of the same, reference being had to the accompanying drawings, forming part of this specification.

Figure 1 is a top view of my improved wire-drawing machine, showing the cast-metal frame, the wire-reel, the draw-head, and portions of the actuating mechanism. Fig. 2 is a front view of the same. Fig. 3 is a view of the lever to which the draw-tong, by which the wire is first drawn through the die, is secured, and also the cam by which the same is operated. Fig. 4 is a cross-section of the machine, showing the wire-pointing device, the cam operating the same, as also the foot-treadle and levers operating the safety-brake. Fig. 5 shows the mechanism by which the die-holder is connected with the clutch-operating mechanism, so that when the wire breaks the driving-clutch is released, and the machine stopped automatically. Fig. 6 is a view of the same mechanism, shown in the position occupied when no strain is exerted on the die-plate or the wire. Fig. 7 is a horizontal section of the machine, showing the main driving-shaft, the cams for operating the drawing-lever, and the cam for actuating the wire-pointing device, as also the beveled gear and driving-clutch. The hinged standard for supporting the wire-reel is shown in solid lines in its normal position, and in broken lines when too much strain is exerted on the wire and the machine is stopped. Fig. 8 is a top view of the clutch when turning loose; Fig. 9, a view of the clutch when engaged, and Fig. 10 an enlarged view of the beveled gear and clutch.

Similar letters of reference indicate corresponding parts in all the figures.

In the drawings, A A are cast-iron end frames, provided with the bearing-blocks B B, in which the main driving-shaft rests. C is the cast-iron front plate, having the lateral plate C^1 either cast in one piece with the front and back plate C^2, or firmly bolted between the two and the whole bolted to the end frames A A, so that the whole forms a firm and substantial structure, not liable to warp and give, as is the case with the heavy wooden tables heretofore used. In the plate C^1 the shaft to which the draw-head is secured has a firm bearing cast with the plate. C^3 C^3 are front and rear horizontal plates, firmly secured to the end frames, and to these plates C^3 the plate C^4 is firmly bolted or cast with the same, and thus forms the step-bearing for the vertical shaft, and also a support for the bearing of the main shaft at the center of the machine.

The end frames A, the top plates C, C^1, and C^2, and the plates C^3 and C^4 form the whole frame, and all the parts are secured to and supported by the same. The spaces between the top plates C, C^1, and C^2 may be filled with wood to form the table, and as the end frames are made to receive two ends of the plates, a number of duplicate wire-drawing machines may be secured end to end, and all operated by one main driving-shaft.

The mechanism employed to perform the different functions of the machine consists of the main shaft *a*, driven by some prime motor, and to which the pinion a^1 is secured, which, gearing into the horizontal beveled gear a^2, rotates the same. *b* is the vertical shaft, to the upper end of which the draw-head b^1 is secured. The shaft *b* passes through the beveled gear a^2, and is supported in a step on the plate C^4. The bevel-gear a^2 may therefore turn on the shaft *b*, being loose on the same, while the clutch b^2 is firmly secured to the shaft *b*.

On the bevel-gear a^2 the hinged pawl *c* is secured, as shown in Figs. 8 and 9, and the pawl *c* is provided with a rounded projection, *c'*, shown enlarged in Fig. 10, and arranged so that when the lever *d* is raised the loose friction-roll *d'* will come in contact with the projection *c'* and engage the hinged pawl with the stop on the clutch b^2, as shown in Fig. 9; and when the lever *d* is lowered the roller *d'* will come in contact with the rear end of the hinged pawl *c*, and disengage the same from the clutch b^2, and stop the rotation of the draw-head. E is a spring arranged to hold the hinged pawl in the position placed by the lever *d*. It is shown as engaging with the end

of the hinged pawl, but may be arranged in any other manner to retain the pawl in the desired position.

One, two, or more hinged pawls may be thus secured to the upper surface of the bevel-gear a^2, and one, two, or more stops provided on the clutch b^2 at regular or irregular distances apart, and operated to secure the driving mechanism to or from the clutch, and thus to or from the draw-head, by the raising or lowering of the lever d.

Instead of securing the hinged pawl to the bevel-gear, the same may be secured to a separate disk, driven in any suitable manner, and thus the driving-power connected with and disconnected from the machine by the raising or lowering of the lever d, thus insuring the prompt action of the clutch, and preventing the binding usual in power-clutches.

Secured to the main shaft a is the cam f, arranged to give reciprocating motion to the lever f^1, the upper end of which passes through a slot in the front plate C, and to this upper end the draw-tongs are connected, as is shown in broken lines in Fig. 1, and by the same a direct strain is exerted to draw the first portion of the wire through the die until enough length is secured to secure the same to the draw-head b^1, when the swiveled die-holder f^2 readily adjusts itself to the new direction of the wire.

The die-holder is secured to a plate by a bolt passing through a slot in the front plate C, so as to allow the die-holder to swing on the bolt and reciprocate in the slot, the whole being held in the forward end of the slot by a coiled spring, and when in operation the strain of the wire on the die brings a strain on the coiled spring, which allows the die-holder to slide in the slot. As soon as the wire breaks, the strain being released, the coiled spring draws the die-holder forward; and as it is desirable that when this happens the machine should be automatically stopped, the lever f^3 is secured to the lower plate of the die-holder, and at its lower end is provided with the stop f^4, which, when strain is exerted on the die, passes over the foot-treadle lever f^5, hinged to the rear portion of the frame, and projecting in front of the machine, and is connected with the hinged lever g, which extends to and raises and lowers the clutch-operating lever d, and as soon as the strain is released the notch in the stop f^4 is brought over the foot-treadle lever f^5, and allows the same to rise, and thus, through the lever g, depress the lever d, and, by bringing the same in contact with the hinged pawl c, stop the revolution of the draw-head. The first of these positions is shown in Fig. 5, and the latter in Fig. 6. By this arrangement the machine will be automatically stopped as soon as the wire breaks.

When the wire suddenly breaks, the portion coiled on the draw-head b^1 is liable to uncoil, and, if the wire is thick, liable to injure the workmen and the machine. To prevent this I place the hinged brake h in contact with the draw-head, so as to hold the wire by the pressure of the spring h^1, and when the same is to be released I press on the foot-treadle h^3, which, through the lever h^2, operates and releases the brake h from the wire, as is shown in Fig. 4.

The coiled wire on the reel is liable to become deranged, and the strain exerted liable to break or otherwise injure the reel and kink the wire. To avoid this I mount the reel on the hinged frame i, the reel i^1 being supported on a vertical spindle passing through two brackets secured to the hinged frame i, and also provided with the arm i^2, which rests against the spring i^3, and is provided with a pin, which extends to the stop f^4, so that when extraordinary strain is exerted on the reel i^1 the pin on the arm i^2 will push the stop f^4 inward, and allow it to pass into a slot in the foot-treadle f^5, and thus allow the same to rise and, through the lever g, to operate the lever d, and stop the rotation of the draw-head, and prevent injury to the wire-reel. The machine will therefore stop automatically when the wire breaks, and also when the wire on the reel becomes deranged.

Every time the wire breaks the end must be pointed, so as to enter the die. This, at present, requires much time. To avoid this I place on the machine a wire-pointing device, consisting of a pair of shears in which the cutters are arranged so as to cut a long point. K K are two hinged jaws, provided with the beveled cutters. One of these jaws is firmly secured to the front plate C, and the other provided with a lever, the end of which enters the cam K′, secured to the main driving-shaft, and thus oscillating motion is imparted to the jaw. The wire is inserted between the jaws, and a long tapering wedge is cut from the same, and, if required, by partially turning the wire, two or more such wedges can be cut, so that the pointed end may be readily inserted in the die. This pointing device saves time, and facilitates the operation of the machine.

The operation of my wire-drawing machine is as follows: A coil of wire being placed on the reel i^1, the operative inserts the end into the pointing device, where it is pointed. He now passes the pointed end through the die, and grasps it with the tongs secured to the reciprocating lever f^1, and continues to draw enough wire to secure the same to the draw-head b^1. He now depresses the foot-treadle f^5, and thus engages the pawl with the clutch b^2, giving rotative motion to the draw-head, and drawing the wire through the die, the brake h holding it firmly on the draw-head, and the strain on the die keeping the stop f^4 over the foot-treadle until all the wire is passed through the die, or until the wire breaks, or the wire on the reel becomes disarranged, when the machine is instantly stopped by the foot-treadle being released, and, in its turn, releasing, through the lever d, the clutch b^2.

The machine is entirely self-contained, is strong and simple in construction and operation, and highly efficient.

Having thus described my invention, I claim as new and desire to secure by Letters Patent—

1. The combination, with the main driving-shaft a, of the pinion a^1, the bevel-gear a^2, the shaft b, and clutch b^2, arranged to drive the draw-head b^1, and be connected with and disconnected from the same, by means substantially as described, as and for the purpose specified.

2. The combination, with the lever a and means, substantially as described, for stopping and starting the draw-head, of the yielding die-holder f^2, levers f^3, f^5, and g, and stop f^4, substantially as described.

3. The combination, with the shaft carrying the draw-head, clutch b^2, and pawl c, of the lever d, foot-treadles f^5, and connecting-lever g, substantially as described.

4. The combination, with the starting and stopping mechanism of a wire-drawing machine, of a detachable reel journaled in a movable frame, and mechanism, substantially as described, for connecting said movable reel-frame with said starting and stopping mechanism, whereby the machine is automatically stopped when an undue strain is exerted on the reel, substantially as described.

5. The combination, with the draw-head b^1, of the brake h, held against the wire on the draw-head, the foot-treadle h^3, and hinged lever h^2, arranged to release the brake, substantially as and for the purpose described.

6. In an organized machine for drawing wire, the combination, with a swinging die, f^2, and the draw-head, of the vibrating lever f^1 and cam f, the free end of said lever being arranged relatively to said die, whereby the wire may be started and drawn through the die by means of suitable tongs attached to said vibrating lever, substantially as described.

7. The combination, with the driving-shaft of a wire-drawing machine provided with a cam, K′, of a stationary jaw secured to the frame of the machine, and a hinged jaw arranged to be actuated by the cam on the driving-shaft, said jaws furnished with suitable cutting-dies for pointing the wire, substantially as described.

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Witnesses:

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