

C. D. ROGERS.
Machine for Drawing Wire.

No. 221,254.

Patented Nov. 4, 1879.

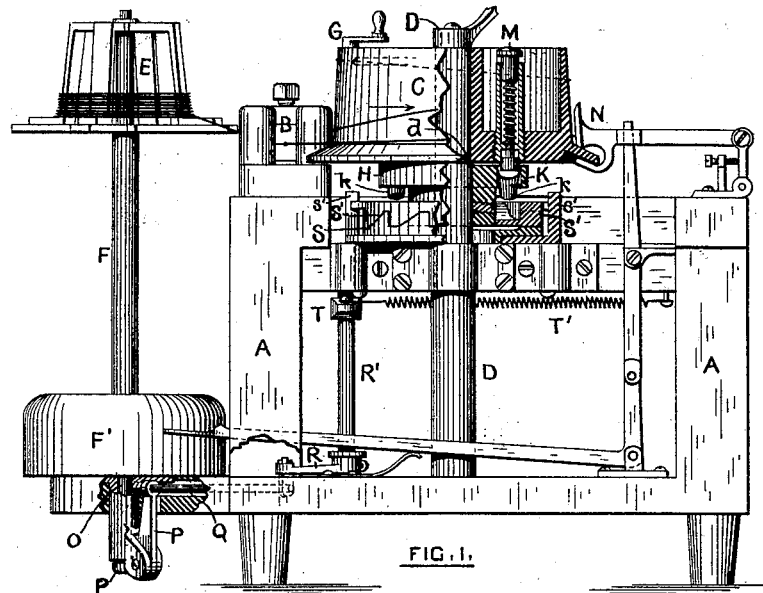


FIG. 1.

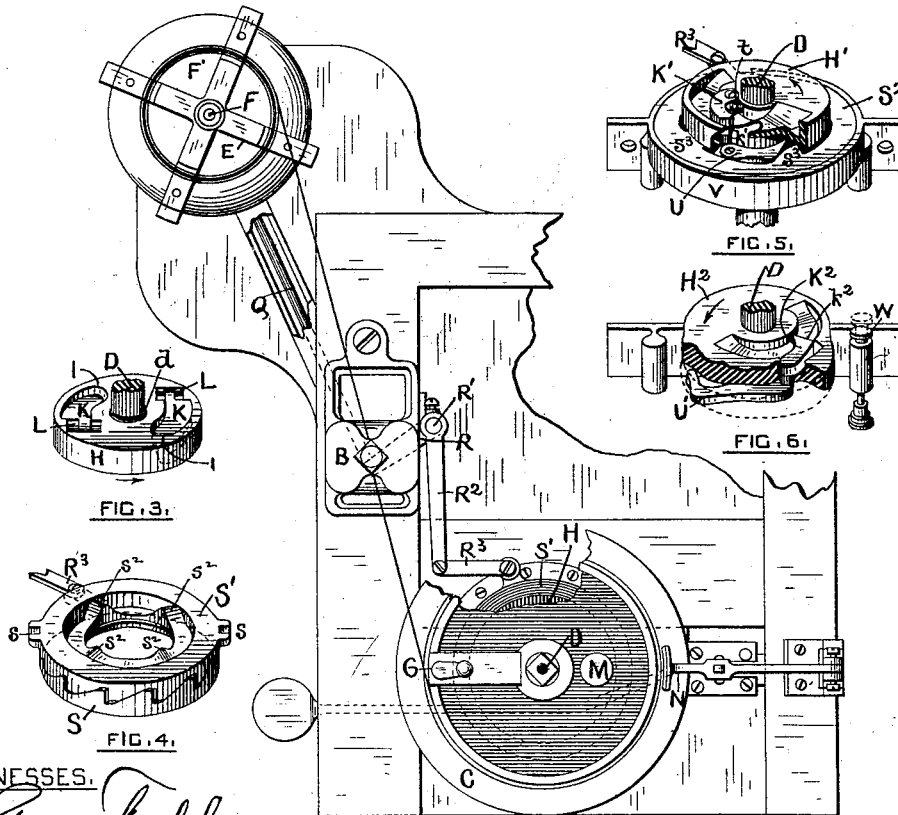


FIG. 2.

WITNESSES.

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IMPROVEMENT IN MACHINES FOR DRAWING WIRE.

Specification forming part of Letters Patent No. **221,254**, dated November 4, 1879; application filed
August 19, 1878.

To all whom it may concern:

Be it known that I, CHARLES D. ROGERS, of the city and county of Providence, and State of Rhode Island, have invented certain new and useful Improvements in Machines for Drawing Wire; and I do hereby declare that the following specification, taken in connection with the accompanying drawings, making a part of the same, is a full, clear, and exact description thereof.

My improvements are applicable to that class of machines which embody a draw-plate and a coiling or drawing drum; and they have for their object the automatic stoppage of the revolution of the said drum, together with the proper control of wire already coiled thereon, when the wire breaks between the draw-plate and drum during the process of drawing, or when, from any other cause, the tension is removed from that portion of the wire which has passed through the draw-plate; also, to the automatic stoppage of the revolution of the said drum when, during the operation of drawing, the reel-standard holding the coil of wire to be drawn becomes overturned or otherwise displaced from its proper position on the floor or bed of the machine.

The disagreeable results attending the breakage of the wire or displacement of the reel-standard in machines as constructed prior to my invention and use of the improvements in machines for drawing wire for which Letters Patent of the United States No. 187,732 were granted me February 27, 1877, are fully described in said patent, and are unnecessary to be spoken of here.

The difficulties arising from the above-mentioned sources are entirely obviated in a machine constructed as described in said patent, but by an arrangement and devices differing from those constituting my present improvements, and hereinafter to be described.

In the patented improvements above referred to the draw-plate is described and shown as an active agent in producing the stoppage of the drum's revolution, it having a motion in the line of draft upon the wire, and the coiling-drum is so arranged that it moves in a vertical plane upon its shaft when its revolution is to be stopped.

In my present improvements the draw-plate

performs no active function in stopping the revolution of the drum, and the said drum always remains in the same horizontal plane, whether in revolution or not.

My present construction is, therefore, an improvement upon that above mentioned as already patented by me, in that the arrangement and devices used operate more speedily to stop the revolution of the drum, and to control the wire on said drum, and are less complicated than those heretofore in use, as will appear by the following description.

Referring to the drawings, Figure 1 represents a front elevation of a wire-drawing machine having my improvements, the coiling-drum and accompanying mechanism being partly in section, and the machine represented as in operation. Fig. 2 shows a top view of said machine with the drum partially cut away. Figs. 3 and 4 represent, in perspective, certain details of construction; and Figs. 5 and 6 show two variations of construction by which the drum may be connected with and disconnected from its shaft, as will hereinafter appear.

A represents the frame of the machine, which is supplied with a draw-plate, as at B, and a coiling-drum, as at C, the latter being mounted loosely upon a continually-revolving shaft, D, and being retained in the same horizontal plane at all times by its bearing upon a shoulder, *d*, upon the shaft D, as shown at Figs. 1 and 3. The wire is delivered from a reel, as at E, placed upon a standard, as at F, having a heavy base, F', and after passing through the draw-plate is secured to the drum by a clamp, as at G, in the usual manner. Securely fastened to the shaft D and always revolving with it is a clutch-plate, as at H, Figs. 1 and 3, placed directly beneath the loosely-mounted drum, as shown at Fig. 1. This plate H is slotted in one or more places, so as to leave an abrupt face, as at I, Fig. 3, and recessed to receive and carry one or more arms, as at K, which are hinged in the recessed portions of the plate, as shown at L, Fig. 3. These arms K have upon their outer ends dependent projections, as at *k*, which, when the arms are in their normal position, pass through the slots in the plate and extend below its under side, as shown at Fig. 1.

For the purpose of rotatively connecting the coiling-drum C with its shaft D, the said drum is supplied with a spring-bolt, as at M, Figs. 1 and 2, which, when depressed, will enter the slotted portion of the revolving plate H directly above the end of one of the arms K and take engagement against the abrupt face I of one of the slots, being then in the position shown in Fig. 1, and the operation of drawing will commence.

The force of the spring upon the bolt M is constantly exerted to break the engagement of the said bolt with the clutch-plate. Therefore, if such engagement is to be maintained, there must be on the coiling-drum a strain in excess of the force of said spring. This strain is supplied during the process of drawing by the friction of the draw-plate upon the wire passing through it to the drum, and so long as this friction is present the said drum is revolved, and the operation of drawing continues; but so soon as this friction ceases, by the breakage of the wire between the draw-plate and drum, or the running out of the coil upon the reel, there is no longer a sufficient strain upon the drum to overcome the force of the spring upon the bolt M. It is, therefore, thrown up, breaking the engagement between the drum and clutch-plate, and the revolution of the drum immediately ceases, the wire upon the drum being prevented from uncoiling by the action of the presser N. This presser N, although employed in my former machines, is an important element in connection with drums, which are stopped, as described, by a free disconnection from their driving-spindles, because, if the free end of the wire be not controlled, and the wire be free to uncoil, the advantages incident to the stoppage of the drum would be practically offset by the disadvantages due to said uncoiling.

I make no claim, broadly, to the means shown, whereby the drum and spindle are connected so as to be disconnected through the absence of tensile strain on the wire, similar mechanism being shown in French Letters Patent of Guerre, April 20, A. D. 1855, No. 13,380; but I confine myself to the same, in combination with the presser N, as above indicated.

Another provision for the stoppage of the revolution of the drum, and consequently of the operation of drawing, is made when the reel-standard becomes overthrown or unduly displaced from its proper position. For this purpose the heavy base F' of the said standard is so placed upon the floor or bed of the machine as to cover and depress a vertically-sliding pin, O, which is seated upon one arm of a bell-crank lever, P, Fig. 1. The other arm of this lever P is connected by a rod, Q, to an arm, R, upon a vertical rod, R'. This rod R' bears upon its upper end an arm, R², which is connected by a link, R³, to a ring, S, Figs. 1, 2, and 4, having two or more inclined planes upon its upper side. This ring is so mounted as to allow of rotation, and working with it is

a fellow ring, S', having similar inclined planes upon its under side, but whose motion is confined to a vertical plane by the ears s and guides s'. Attached to the rod R' is an arm, T, connected to a spring, T', as shown at Fig. 1. The force of this spring T', and the gravity of the base F' of the reel-standard are in opposition, so that when the said standard is in place the pin O is depressed, and, through the bell-crank lever P, rod Q, arm R, rod R', arm R², and link R³, the ring S is rotated so as to allow the fellow ring S' to assume the position shown at Figs. 1 and 4, the spring T' being strained through its connection to the rod R' by the arm T. Now, the ring S' has upon its upper surface one or more inclined planes or cam-faces, s², located in a circle directly under the dependent ends k upon the arms K, and when the reel-standard is in its proper position, the ring S', with its inclined planes s², assumes a position below the plane of revolution of the parts k; but should the said standard be overturned or displaced so as not to cover the pin O, the spring T' will immediately act through the arm T, rod R', arm R², and link R³, to rotate the ring S, which will raise the ring S', so that the ends k of the arms K will come in contact with the cam-faces s², and thereby force the spring-bolt M upward and out of engagement with the clutch-plate H, and the revolution of the drum will cease until the reel-standard is replaced, and the spring-bolt M made to again engage the clutch-plate H.

It will thus be seen that the spring-bolt M is the key to the stoppage of the revolution of the drum, either when the wire breaks or the reel-standard is overturned; and, although I have thus far described certain definite devices as acting with said spring-bolt to produce the desired result, yet I am well aware that many others may be used in connection with said bolt without departing from the spirit of my invention. I have in this connection shown two variations at Figs. 5 and 6 of the drawings, and will now proceed to describe them.

Referring to Fig. 5, H' is a clutch-plate secured to the revolving shaft D, immediately under the drum C. This plate H' has a semi-circular groove with inclined ends cut into its upper surface, in which is pivoted a latch, as at K', having upon its end a projection, k', depending through a curved slot in the bottom of the groove. This latch K' is furnished with a spring, as at t, which swings the end of the said latch outward until it is in contact with or near to the rim of the plate H'. An angular space is thus formed into which the spring-bolt M finally enters after being depressed, and takes bearing against the inclined end k' of the latch K', and the drum is driven and its revolution stopped, when the wire breaks, in the manner already described.

Should the reel-standard be displaced, however, the spring T, through the link-connection R³, already described, would partially rotate a flat ring, as at S³, having upon

its inner periphery a series of inclined faces, s^3 , which would operate upon a series of arms, as at U, pivoted to the flanged disk V, so as to swing the cam-shaped ends of the said arms inward to engage with the dependent projection k' upon the latch K', and so swing the latch K' inward and release the spring-bolt M, thereby stopping the revolution of the drum.

The variation shown at Fig. 6 consists simply of a disk or clutch-plate, H^2 , secured to the shaft D, and always in revolution with it, the said disk being supplied with a semicircular groove having inclined ends in which is pivoted a latch, as at K^2 , whose end k^2 , when in its normal position, extends across the groove and comes into contact with the spring-bolt M when the latter is depressed, the said latch being held in such position by a spring acting upon a cam-finger, as at U', which is connected with the said latch. Should the wire break during the drawing, the revolution of the drum is stopped, as before described; but should the reel-standard be displaced, a distinct arrangement is made in this device for accomplishing the desired result. The reel-standard operates through the pin O, bell-crank lever P, &c., to depress a rod or bolt, as at W, so that the cam-finger U' may revolve in a plane above it when the said reel-standard is properly placed; but when the said standard is removed the bolt W will be forced up by a spring and engage with the cam-finger U', and trip the latch K^2 , thereby

releasing the spring-bolt M, and stopping the revolution of the drum.

It will thus be seen that the clutch-plate and its accompanying devices may be greatly varied in form and operate, in connection with the spring-bolt M, to accomplish the stoppage of the revolution of the drum under the circumstances specified; therefore,

Having described my invention, what I claim, and desire to secure by Letters Patent, is—

1. In a machine for drawing wire, the combination, with the draw-plate, the coiling-drum, the driving clutch-plate and spring-bolt, which rotatively connects the clutch-plate and drum and affords a free disconnection of plate and drum in the absence of tensile strain on the wire, of the presser N, which controls the free end of the wire on the drum and obviates uncoiling when the drum and spindle are operatively disconnected, substantially as described.

2. The combination, with the coiling-drum, the driving clutch-plate, and the bolt by which the drum and clutch-plate are rotatively connected, of stopping mechanism controlled by a reel-stand, substantially as described, whereby, when the reel-stand is unduly displaced, the stopping mechanism slides the bolt and causes a disconnection of the drum and clutch-plate, as set forth.

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Witnesses:

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I. KNIGHT.