J. H. O'DONNELL & W. D. PIERSON.

WIRE DRAWING MACHINE.

APPLICATION FILED JULY 25, 1910.

1,025,421.

Patented May 7, 1912.

3 SHEETS—SHEET 1.

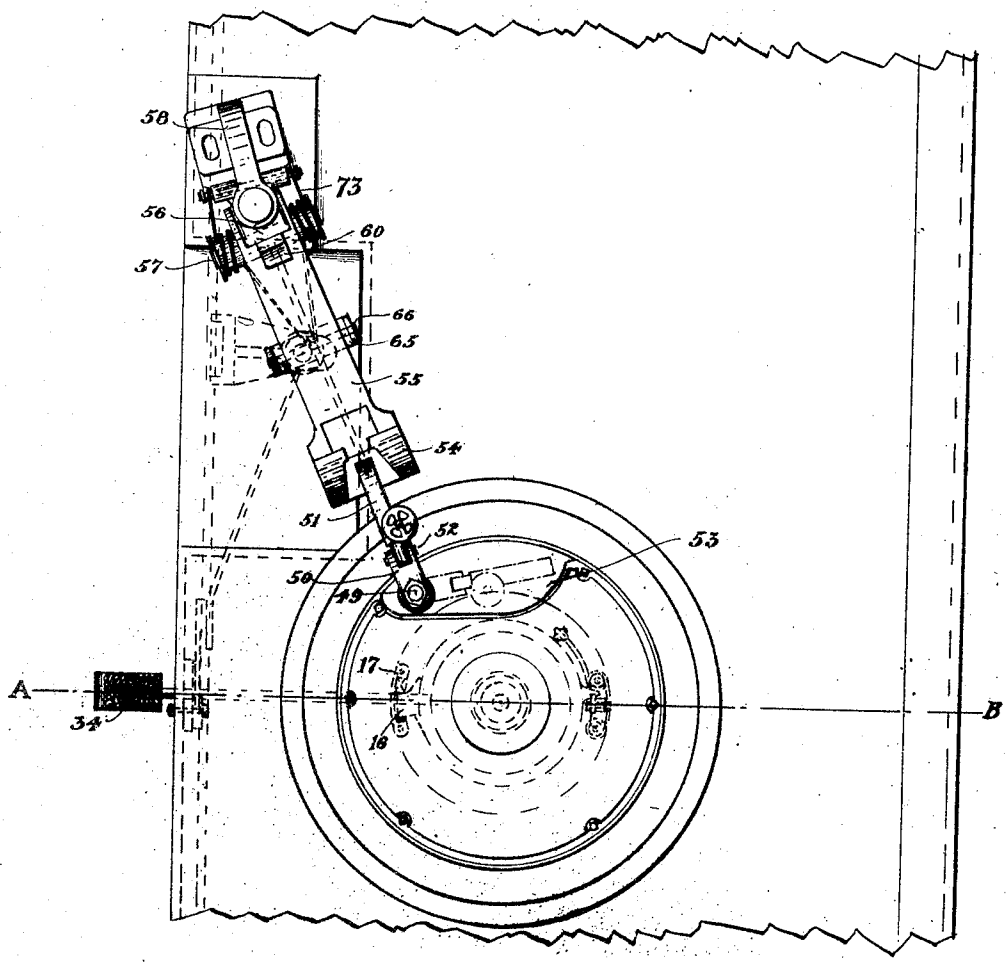

Fig. 1.

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3 SHEETS—SHEET 2.

Fig. 3.

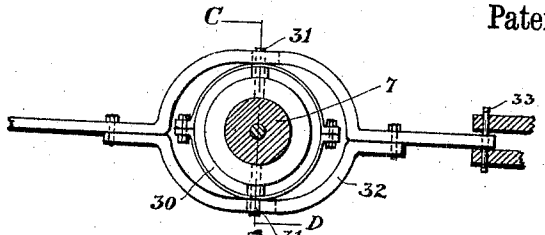


Fig. 4.

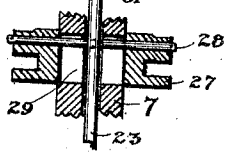


Fig. 5.

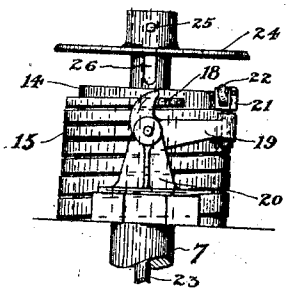
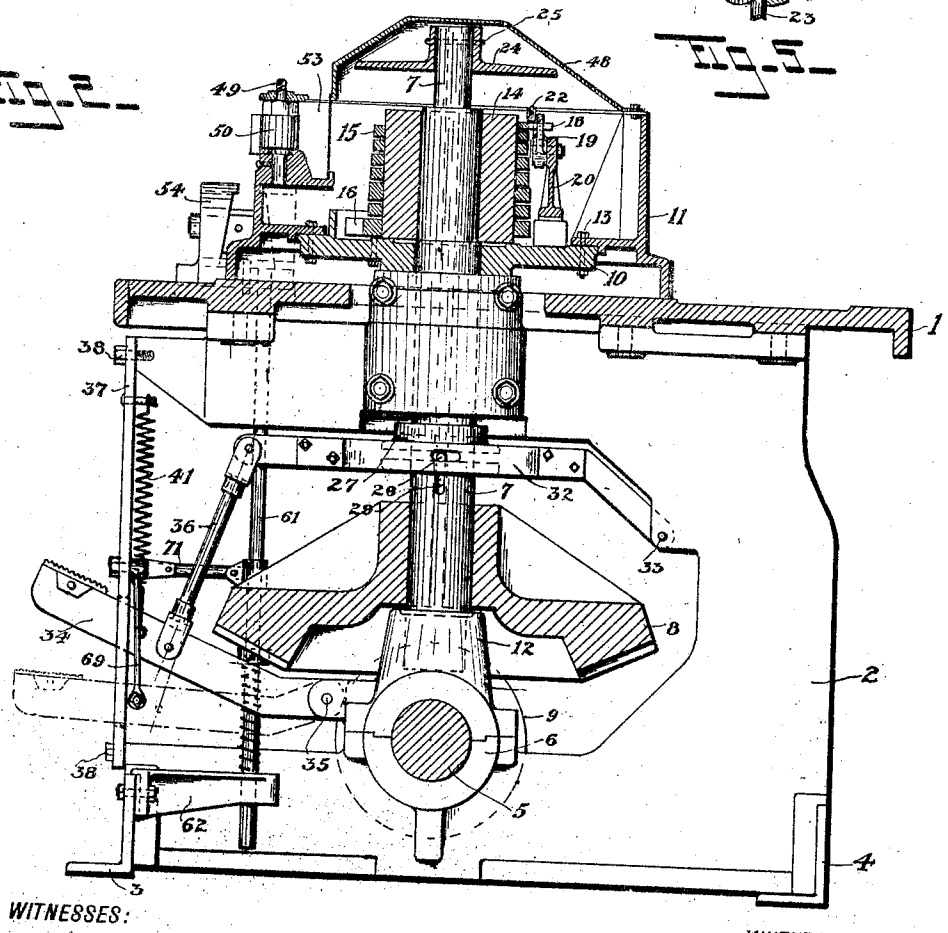


Fig. 2.



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3 SHEETS—SHEET 3.

Fig. 5.

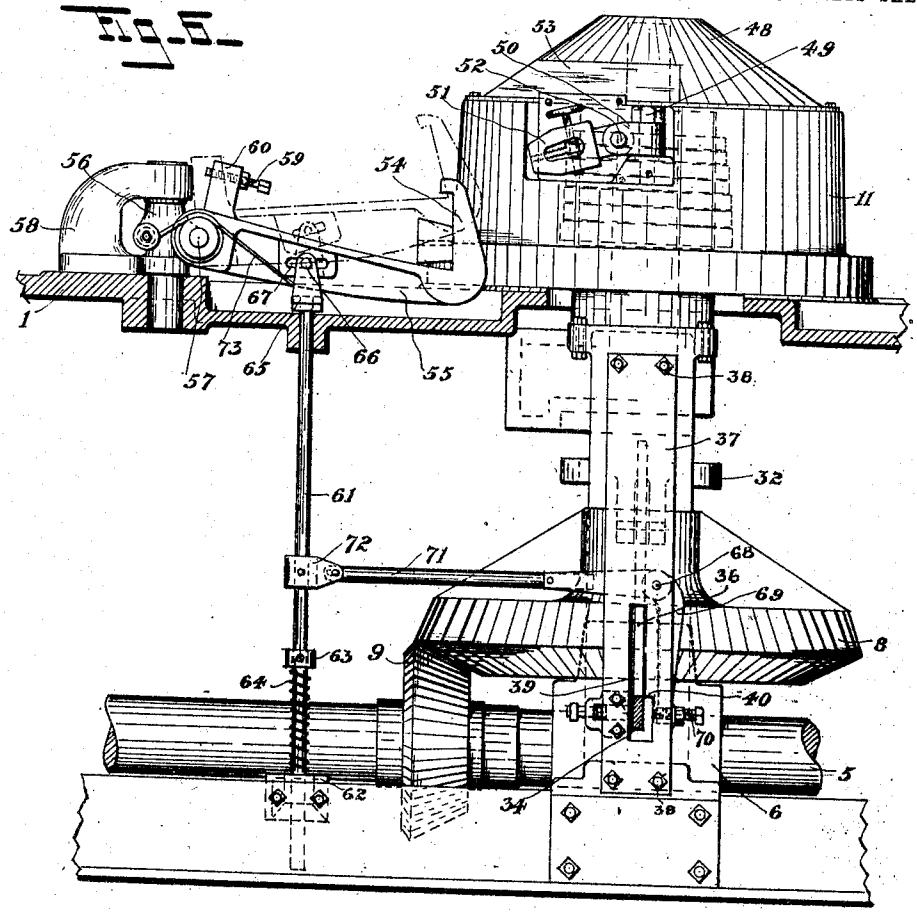

Fig. 8.

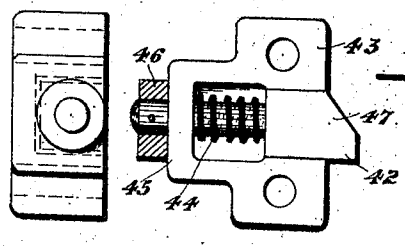

Fig. 7.

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UNITED STATES PATENT OFFICE.

JOHN H. O'DONNELL AND WILLIAM D. PIERSON, OF WATERBURY, CONNECTICUT, ASSIGNORS, BY MESNE ASSIGNMENTS, TO THE WATERBURY FARREL FOUNDRY AND MACHINE COMPANY, OF WATERBURY, CONNECTICUT, A CORPORATION OF CONNECTICUT.

WIRE-DRAWING MACHINE.

1,025,421. Specification of Letters Patent. Patented May 7, 1912.

Application filed July 25, 1910. Serial No. 573,598.

To all whom it may concern:

Be it known that we, JOHN H. O'DONNELL and WILLIAM D. PIERSON, citizens of the United States, residing at Waterbury, in the county of New Haven and State of Connecticut, have invented certain new and useful Improvements in Wire-Drawing Machines, of which the following is a specification, reference being had therein to the accompanying drawings.

Our invention relates to new and useful improvements in wire drawing machines, and has for its object, among other things, to provide a machine of this character with friction mechanism so mounted and arranged within the block that the block may be removed and another one substituted without affecting the friction devices, and operate the same with mechanism of simple design that will be positive in its action and control; to provide the universally mounted die holder with means for limiting its movement in one direction; means for automatically actuating the friction device when the wire has been completely drawn through the die or is broken; and to arrange the several parts so that the grip in the block may be brought up close to the face of the die, without bringing the axis of the die holder, block, and grip in the same line.

To these, and other ends, our invention consists in the wire drawing machine, having certain details of construction and combinations of parts, as will be hereinafter described and more particularly pointed out in the claims.

Referring to the drawings, in which like numerals of reference designate like parts in the several figures; Figure 1 is a plan view of a portion of our new and improved wire drawing machine; Fig. 2 is a sectional view thereof upon line A—B of Fig. 1; Fig. 3 is a sectional view of the block shaft, showing a plan view of some of the mechanism for operating the friction plate; Fig. 4 is a sectional view thereof upon line C—D of Fig. 3; Fig. 5 is a side elevation of the friction clutch with the mechanism for operating the same; Fig. 6 is a front elevation, partly in section, of our new and improved wire drawing machine; with the treadle in section in substantially its down position, and Figs. 7 and 8 are front and end views respectively of the treadle plunger and its casing.

In the drawings, the numeral 1 designates the table, which is supported upon suitable legs 2, which are connected by the front and back angle plates 3 and 4; 5 is the main driving shaft, which is rotating continuously in the journal boxes 6, connected with the legs 2; 7 is the block shaft, rotatably mounted in the cap 12 of the journal box 6, and having a bevel gear 8 thereon, the teeth of which mesh into those of a pinion 9 fixed on the shaft 5. Rotatable on the shaft 7 is the plate 10, to which the wire block 11 is secured by screws 13. Fixed to said shaft, or integral therewith if desired, and adjacent to said plate, is the friction hub 14, which is surrounded by a friction coil 15, the head end 16 of which is secured to the plug 17 (Fig. 1) on the plate 10, and the tail end of which terminates in the pin 18 that projects into the path of one arm of a rock lever 19 that is pivotally mounted upon a standard 20, also secured to the plate 10. Said rock lever has a yoke stud 21 connected therewith, within which a roll 22 is rotatably mounted.

Slidably mounted within the block shaft 7 is the reciprocating rod 23, to the upper end of which is secured the friction plate 24, by means of the pintle 25, which pintle passes through a slot 26 in the shaft 7. Secured to the rod 23, below the block 11, by the pintle 28 is a hub 27, said pintle passing through a slot 29 in the shaft 7. Rotatably connected with the hub 27 is the split ring 30, having the pins 31 thereon that project radially therefrom into the arms of the fork 32, which is hinged to the leg 2 by the pintle 33 and is connected, through the rod 36, with the treadle 34, hinged to the cap 8 by the pintle 35.

The numeral 37 designates the front plate, which is secured to the leg 2 by bolts 38, and provided with an L slot 39, through which the treadle 34 projects.

In our invention the shafts 5 and 7 are rotating continuously and the block 11 is free to rotate with the shaft 7 or remains stationary, as desired, the connection between said shaft and block being the friction coil 15.

To actuate the friction coil so as to couple

the block 11 with the shaft 7 and impart rotation thereto, the treadle 34 is depressed to a point near the bottom of the L slot 39, and then moved laterally into the horizontal portion of said slot, when, by releasing the pressure thereon, the treadle is held in its down position, shown by broken lines in Fig. 2, against the shoulder 40 by the spring 41. During the downward movement of the treadle 34 the plate 24 is moved toward the hub 14, through the rod 23, until it contacts with the roll 22, when the lever 19 is rocked upon its pivot mounting and the coil 15 grips the hub 14 by reason of the engagement of said lever with the pin 18. To release the friction and stop the rotation of the block 11, it is simply necessary to shift the treadle 34 laterally until it is disengaged from the shoulder 40, at which time the spring 41 will pull the same upwardly through the vertical portion of the slot 39, this action at the same time lifting the plate 24 from its engagement with the roll 22, when the coil unwinds itself sufficiently to release its grip upon the hub 14.

To insure against the accidental disengagement of the treadle 34 with the shoulder 40, we have provided a plunger 42, which is slidably mounted within a casing 43 fixed to the plate 37, and having a coil spring 44 surrounding the shank thereof between the head and the integral shoulder 45, a fixed collar 46 limiting the movement of said plunger 42 in one direction. The head of the plunger 42 normally lies across the slot 39, and when the treadle 34 is depressed, it contacts with the angular face 47 upon said plunger and moves the same within the casing 43 against the tension of the spring 44, until the upper edge of the treadle is in line with the shoulder 40, when the spring 44 forces the plunger 42 outwardly and moves the treadle 34 under the shoulder 40 and there holds it against accidental displacement. The outward position of the plunger 42 is shown in Fig. 7, and its retracted position in Fig. 6.

All of the mechanism within the block is concealed and protected against external injury by a cover 48 and the whole block is readily detached from the plate 10 for repairs or substitution of a block of different size, by removal of the screws 13.

Pivoted to the block 11 by the stud 49 is the link 50, to which the grip 51 is secured by the pin 52, the whole being movable into or out of the recess 53 in said block. The peculiar construction of this grip, and the manner of securing the same in the block, constitutes no part of our present invention, having been heretofore made and in common use.

The drawing die is held against the arms 54 of the die holder 55, pivotally connected with the swivel block 56 by the pintle 57, which swivel block is rotatably mounted in the bracket 58, secured to the bed 1. The connection between the die holder 55 and bracket 58 is such that the die holder has both a vertical and horizontal movement. A stop screw 59 threaded through the lug 60 on the die holder contacts with the bracket 58 to adjustably limit the upward movement of said die holder.

The trip rod 61 is vertically movable within the bracket 62 and bed 1 with an adjustable collar 63 thereon, between which and the bracket 62 is the coil spring 64. To the upper end of the trip rod is secured the yoke 65, having a pin 66 therein, which passes through a slot 67 in the die holder 55. The yoke 65 is of sufficient width between the arms thereof to permit of a lateral movement of the die holder 55 therebetween. Hinged to the plate 37, by the pintle 68, is the trip lever 69, having the screw 70 threaded through one end thereof, and connected at the other end with the trip rod 61 through the link 71, secured to the adjustable block 72.

To begin the drawing of wire in our improved machine, the wire block 11, now free to rotate upon the shaft 7, is moved about its axis until the grip, swung around upon its pivot mounting is brought up close to the face of the die, to bite the wire, which has been previously pointed for about an inch or an inch and a half from the end, and projected through the die from the rear, as is common in the art, the die holder at this time being in its upward position, shown by broken lines in Fig. 6, and normally held in this position by the spring 73. The relative positions of the die holder and grip are such, at the beginning of the drawing operation, that the axes of the grip and die holder are in the same line, which, if extended, would not pass through the center of the block. Now, by depressing the treadle 34, the friction coil engages the hub 14 and the block begins to rotate, the grip during this rotation moving into the recess 53, as shown by the dotted lines in Fig. 1, at which time the die holder is moved upon its pivot mounting, so that a line through the center thereof and the die will be tangential to the wire block. As the drawing operation continues, the die holder 55 drops, by reason of the movement of the wire about the block, until it assumes its down position, shown by full lines in Fig. 6. If the wire should break, the drawing strain upon the die holder is removed, and the spring 73 moves the die holder upwardly and the spring 64 the trip rod 61 upwardly, imparting a rocking movement to the lever 69, and the screw 70 therein contacts with the treadle 34 and forces the same from its engagement with the shoulder 40 against the plunger 42, when the spring 41 will move the same upwardly

and disconnect the friction mechanism as above described. It will be seen that by this construction and operation the friction mechanism is contained within the die block, and is of such a nature that a new wire block may be substituted with the least possible labor and without interfering with the operation or adjustment of the friction mechanism; that the wire block will be immediately disconnected as soon as the wire breaks or is drawn through its full length; and that the initial drawing action by the grip is in a direct, straight line with the die and die holder, but not with the center of the block.

Within our invention any other type of spring for operating the die holder may be used equally as well as the one herein shown, and wire blocks and grips of different shapes and relative size may be substituted for those herein shown, and in other ways details of our invention may be modified considerably.

What we claim as new, and desire to secure by Letters Patent, is:—

1. In a wire drawing machine, the combination with the block; of a movable die holder; a shaft; friction means for connecting said block and shaft; a treadle, a connection between said treadle and friction means; means for holding said treadle against accidental movement when said friction means has operatively connected said block and shaft; and means, actuated from said die holder, for releasing said treadle from its holding means.

2. In a wire drawing machine, the combination with the block; of a movable die holder; a shaft; friction means for connecting said block and shaft; a treadle; a connection between said treadle and friction means; means for holding said treadle against accidental movement when said friction means has operatively connected said block and shaft; means for releasing said treadle from its holding means, comprising a rock lever having a part thereon that contacts with said treadle when in its holding position; and a connection between said die holder and rock lever.

3. In a wire drawing machine, the combination with the block; of a die holder; a shaft; friction means for connecting said block and shaft; means for operating said friction means through said shaft; and means for operating said friction means from said die holder.

4. In a wire drawing machine, the combination with the block; of a shaft; friction means for connecting said block and shaft; a reciprocating rod in said shaft for actuating said friction means; a treadle; means for connecting said treadle and rod, whereby said rod may be operated during the rotation of said shaft; means for holding the treadle in one of its positions; a die holder; and means, actuated by the movement of said die holder, for releasing said treadle from said holding means.

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

JOHN H. O'DONNELL.
WILLIAM D. PIERSON.

Witnesses:
B. D. CHILDRESS,
FRED S. VAN VALKENBURG.