

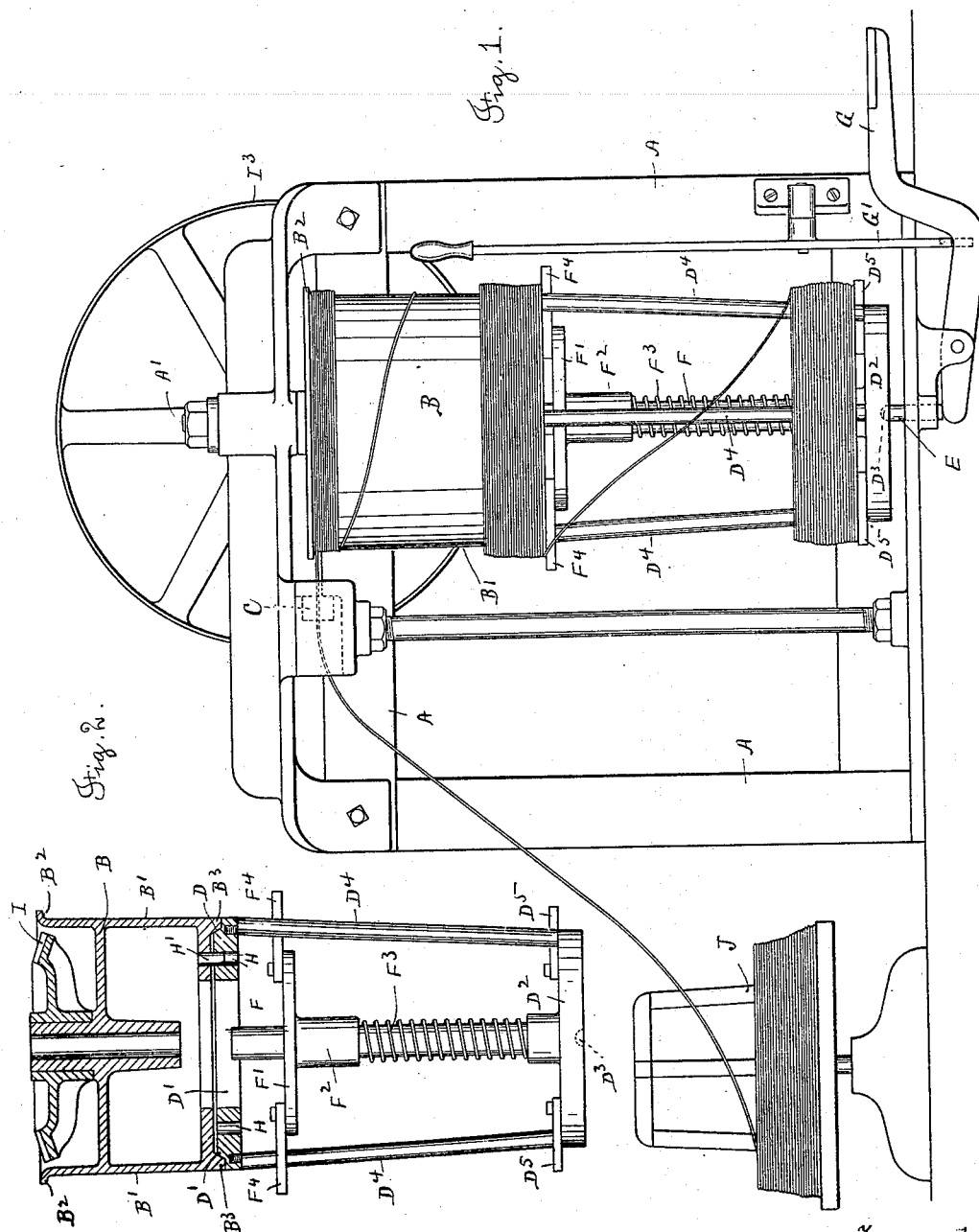
(No Model.)

3 Sheets—Sheet 1

C. H. MORGAN.
WIRE DRAWING MACHINE.

No. 553,353.

Patented Jan. 21, 1896.



Witnesses
A. Whiting.
Henry W. Fowler

Inventor
Charles H. Morgan
By his Attorney
Rufus B. Fowler

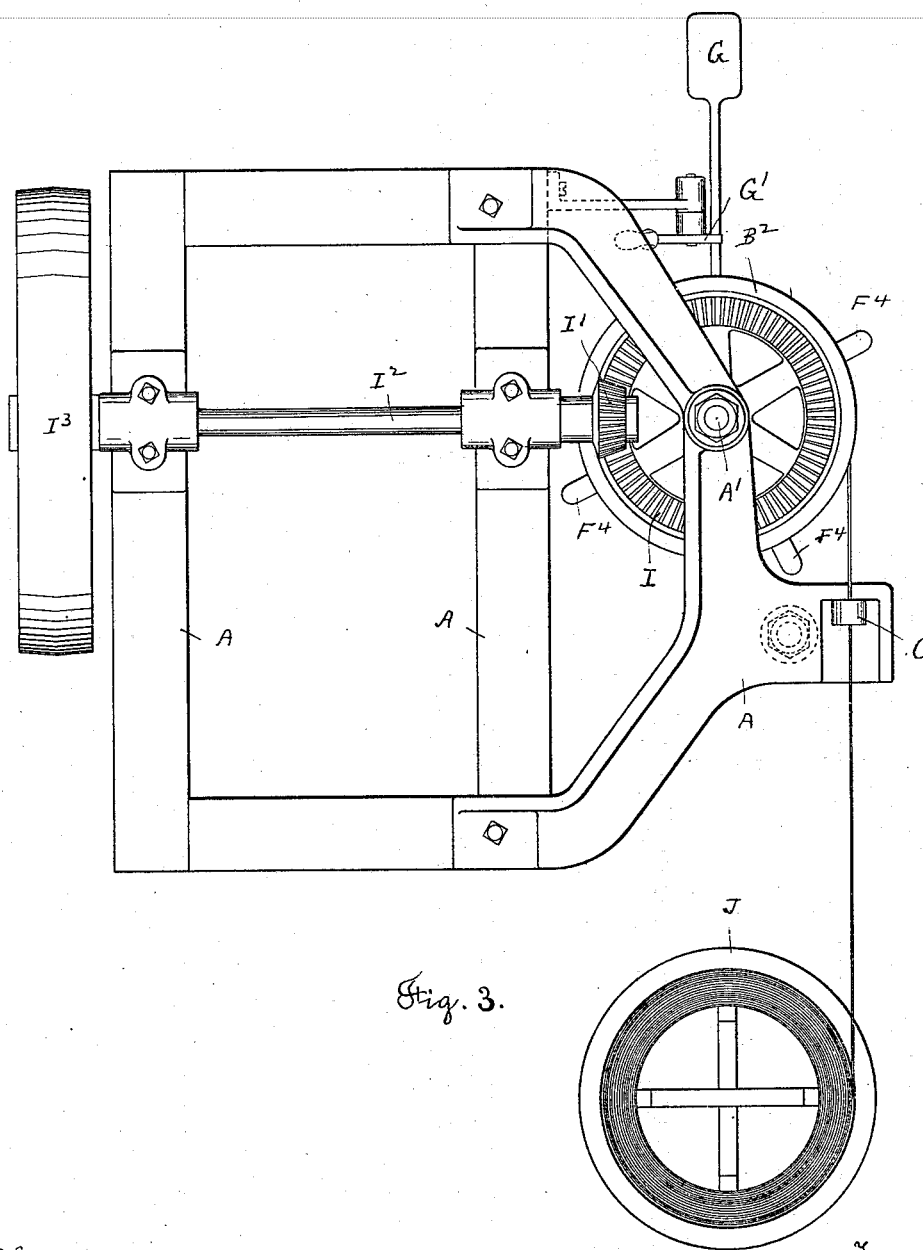
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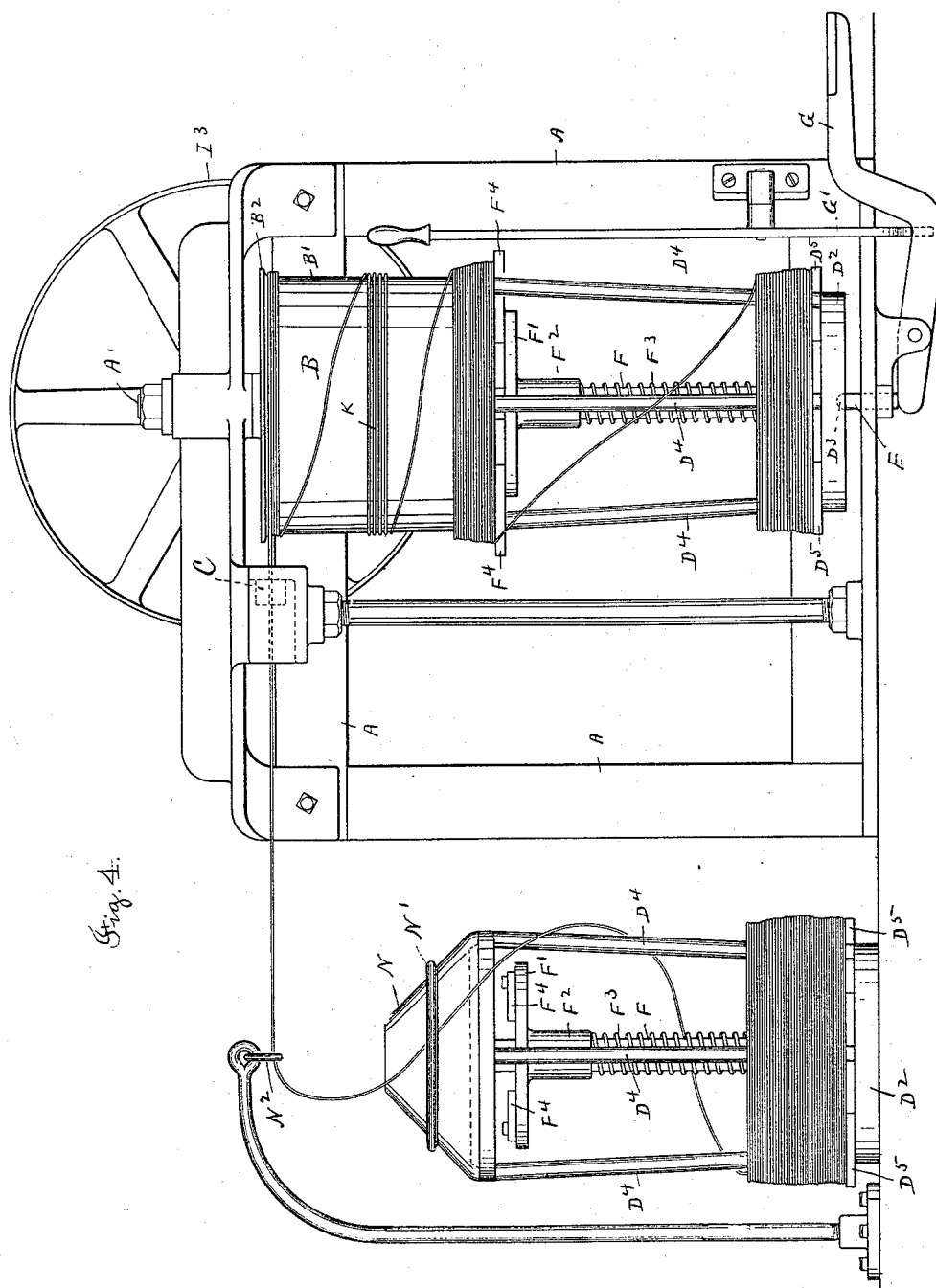
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UNITED STATES PATENT OFFICE.

CHARLES H. MORGAN, OF WORCESTER, MASSACHUSETTS, ASSIGNOR TO THE
MORGAN CONSTRUCTION COMPANY, OF SAME PLACE.

WIRE-DRAWING MACHINE.

SPECIFICATION forming part of Letters Patent No. 553,353, dated January 21, 1896.

Application filed December 14, 1893. Serial No. 493,636. (No model.)

To all whom it may concern:

Be it known that I, CHARLES H. MORGAN, a citizen of the United States, residing at Worcester, in the county of Worcester and State of Massachusetts, have invented a new and useful Improvement in Wire-Drawing Machines, of which the following is a specification, accompanied by drawings representing a reel embodying my invention, in which—
Figure 1 represents a side elevation of my improved wire-drawing machine. Fig. 2 is a central sectional view of the wire-drawing drum or block and the detachable reel connected therewith. Fig. 3 is a plan view of the machine, and Fig. 4 is a side view of the machine, representing the coils of wire in the act of falling from the upper portion of the drawing-block upon the arms of the reel, said Fig. 4 also illustrating the adaptation of my improved reel as a delivering-reel.

Similar letters refer to similar parts in the different figures.

The object of my present invention is to provide means adapted to be employed in connection with wire-drawing mechanism by which the coils of wire, as they are successively wound upon the drum or block in the operation of wire-drawing, shall be automatically delivered therefrom and received upon the reel, to provide means for increasing the capacity of the reel in order to enable greater lengths of wire to be continuously drawn, and, further, to adapt the reel to be conveniently and readily connected with and detached from the drum or block of a wire-drawing bench or machine in order to allow the reel to be used both as a receiving and delivering reel and obviate the necessity of handling the wire, which by the use of my improved reel can be drawn continuously in coils of greater weight.

Referring to the drawings, A denotes the framework of a wire-drawing machine supporting a fixed stud or spindle A', upon which is journaled a rotating drum or block B having its face B' preferably slightly tapering with the lower end of the drum the smallest, and provided at its upper end with a flange B² arranged to rotate in the plane of a wire-drawing die C so the drawn wire as the drum

B rotates will be conducted by the flange B² upon the cylindrical face B' of the drum.

The lower end of the drum B is provided with an annular lip B³ fitting a shoulder D upon an annular plate D', by which the plate D' when brought into engagement with the lip B³ is held concentrically with the drum B. The annular plate D' forms the upper head of the reel, the lower head of the reel consisting of a circular plate D², which is provided with a small central recess (indicated by the broken lines D³ in Figs. 1 and 2) adapted to fit the upper end of a spindle E, which serves as a step to support the reel. The plates D' and D² forming the fixed heads are connected by rods D⁴ forming the body of the reel.

The diameter of the reel, formed by the rods D⁴, is preferably slightly contracted in diameter at its lower end and the annular plate D' is made of the same diameter as the diameter of the smaller end of the drum B and the outer sides of the rods D⁴ are flush with the edge of the annular plate or head D' so as to allow the coils of wire, as they are placed upon or removed from the reel, to pass freely over the plate D'.

The lower head D² of the reel supports a fixed post F attached to the head D² and extending upwardly and centrally between the rods D⁴. Adapted to slide upon the post F is a plate F' provided with a hub F², in order to form a suitable bearing upon the post, the lower end of the hub F² resting upon the upper end of the spiral spring F³ held upon the post F and between the sliding plate F' and head D², with the tension of the spring applied to raise and support the sliding plate F'. Arms D⁵ are pivoted upon the upper surface of the lower head D² and similar arms F⁴ are pivoted upon the upper surface of the sliding plate F', these arms being arranged to extend radially from the head D² and plate F' and project beyond the rods D⁴ to receive the coils of wire as they are delivered from the rotating drum B, but capable of being turned upon their pivots wholly within the circumference of the head D² and plate F' when required.

The spindle E is capable of a vertical slid-

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ing motion in the framework of the machine and is provided with connected means by which it and the reel supported thereon may be raised to bring the annular plate or head D' into engagement with the end of the rotating drum, and lowered to release the reel and allow it to be removed from the drum.

The mechanism represented in the accompanying drawings to accomplish the raising and lowering of the step-spindle E consists of a pivoted foot-treadle G, which is depressed by the operator to raise the reel into the position shown in Figs. 1 and 4, and is locked by a pivoted latch G'.

The annular plate or head D' is provided with a series of concentric holes H, arranged to be engaged by a pin H' projecting from the end of the rotating drum B, causing the rotation of the drum to be imparted to the reel. The drum B is rotated by means of its attached bevel-gear I engaging a pinion I' upon the horizontal driving-shaft I², which is driven by means of a belt-pulley 13.

The operation of my improved reel is as follows: The wire to be drawn is taken from a reel J, Fig. 1, through the die C and wound upon the rotating drum B in the usual manner, the wire being laid upon the drum B in a series of coils, which are crowded down as each succeeding coil is wound upon the drum immediately beneath the projecting flange B². As the wire is wound upon the drum B, the several coils will be thus pushed downward upon the surface of the drum until the friction between the face of the drum and the advancing coils of wire is sufficiently reduced, when several coils will fall by their own weight over the surface of the drum and be caught by the projecting ends of the arms F⁴. In practice the wire has been found to fall intermittently, several coils falling simultaneously, and in Fig. 4 I have represented at K four coils of wire as in the act of falling from the upper to the lower end of the rotating drum B. The coils of drawn wire are in the manner described deposited upon the arms F⁴, and as the accumulating wire held upon the arms F⁴ increases in weight, the spiral spring F³ is gradually compressed, allowing the plate F' with its load of wire to descend. The arms F⁴ are then turned upon their pivots, carrying them within the circumference of the plate F', allowing the wire held upon the arms F⁴ to fall upon the arms D⁵, when the plate F', being relieved of its load, again rises into its elevated position, the arms F⁴ are again extended, and the operation of reloading resumed, each successive load being transferred to the arms D⁵ until the reel is filled. When the reel is filled, the step-spindle E is released and the reel lowered and disengaged from the end of the rotating drum, so it may be removed and replaced by an empty reel. The filled reel is supported in an upright position upon the head D², as represented in Fig. 4, and used as a delivering-reel during the next operation of drawing the

wire by providing the annular plate D' with a cone N and a ring N' lying loosely upon the cone. The wire is withdrawn from the upper end of the reel by being carried between the cone N and ring N' and through a guiding-ring N², supported over the reel in the usual manner.

It has been common heretofore to employ a cylindrical drum or block upon which the wire is wound in the operation of wire-drawing, said block having tapering sides, and as the individual coils of wire were wound upon the block they were lifted or crowded upward along the tapering sides of the block and it has been common to increase the capacity of the block for holding wire by means of rods or arms projecting upwardly, so as to increase the length available for holding the wound wire; but this arrangement does not permit wire to be drawn continuously in great lengths for the reason that the weight of the wire accumulated upon the block soon becomes too great to allow the wire to be raised by the operation of winding the succeeding coils upon the block. By reversing the drum or block and applying a reel to the end of the block having its axis coincident with the axis of the block the wire is held by frictional contact upon the surface of the block until it is crowded downward upon the face of the block and the friction becomes insufficient to sustain the weight of the wire. It will be obvious that a short reel might be employed and the wire dropped from the block directly upon the arms D⁵; but by the employment of an intermediate sliding plate F', with its projecting arms, I am enabled to increase the length and capacity of the reel, as the wire in falling by gravity will need to fall only the length of the drum or block, and consequently decrease the length of the wire wound spirally around the reel and connecting the coils at the upper end of the block with the coils resting upon the lower arms D⁵.

I deem it to be broadly new to provide a wire-drawing drum or block to be used in an inverted position, so the coils of wire will be held against gravity when first wound upon the block by the frictional resistance between the coils of wire and the surface of the block, and subsequently released by the decrease in the frictional resistance, and I also deem it to be broadly new to provide a receiving wire-reel held at the end of a wire-drawing block and coincident therewith, so the wire in falling will pass from the block upon the reel, and so far as these features of my invention are concerned I do not confine myself to any specific form of construction of the wire-reel or of the mechanism by which it is raised and lowered in order to bring it into or out of engagement with the wire-drawing block; neither do I desire to confine myself to the employment of a reel applied to the end of a wire-drawing block, as it is obvious that with an inverted block as the component part of a wire-drawing machine the wire can

be delivered from the end of the block by the intermittent falling of each successive group of coils over the surface of the block whatever the form or construction of the receiving-reel may be and whatever its special method of connection with the block. In fact, the operation of the block in holding a sufficient number of coils to produce the requisite amount of tension or pull upon the wire to draw it through the die or draw plate, and when that has been secured to cause the wire to be released so as to be carried off the block by the force of gravity, is entirely independent of the receiving device, and would be secured if the wire fell off the lower end of the block upon the floor of the mill or upon a shelf or platform arranged to secure it.

What I claim as my invention, and desire to secure by Letters Patent, is—

1. In a wire drawing machine, the combination with a wire drawing die, of a wire drawing drum rotating about a vertical axis and having its upper end adapted to receive the coils of wire as they come from said die and draw the wire through said die by the frictional contact of said coils with the surface of said drum, said drum having its surface gradually tapering toward its lower end, whereby the coils of wire, as they are moved down said drum, are allowed to fall by the reduction of the friction between said coils and the surface of the drum, substantially as described.

2. In a wire drawing machine, the combination with a wire drawing die of a wire drawing drum rotating about a vertical axis and having its upper end adapted to receive the coils of wire as they come from the wire drawing die and draw the wire through said die by the frictional contact of said coils with the surface of said drum, a flange projecting from the upper end of said drum against which the coils are successively wound, whereby each coil of wire causes the preceding coils to be crowded downward on the surface of the drum and said drum having its sides tapering toward its lower end, whereby the coils of wire are allowed to fall by the reduction of the friction between said coils and the surface of the drum, substantially as described.

3. The combination with the drum or lock of a wire drawing machine, having gradually tapering sides and arranged to rotate about a vertical axis and preferably with its smaller end the lowest, of a receiving reel placed at the smaller end of said drum or block, and coincident therewith, said receiving reel being detachable from said drum, or block, substantially as described.

4. The combination with the drum, or block of a wire drawing machine preferably having gradually tapering sides, and arranged to rotate about a vertical axis, with the smaller end of the drum or block the lowest, of a receiving reel placed at the lower end of, and coincident with, said drum, or block, said reel being operatively connected with said drum, or block, so as to rotate therewith, substantially as described.

5. The combination with the drum, or block, of a wire drawing machine, arranged to rotate about a vertical axis, of a reel arranged to receive the wire from the lower end of said drum, or block, and a step bearing for said reel, capable of being raised to carry said reel into engagement with said drum, or block, substantially as described.

6. The combination with the drum, or block, of a wire drawing machine, arranged to rotate about a vertical axis, of a reel arranged to receive the wire from the lower end of said drum, or block, a vertically sliding spindle forming a step bearing for said reel and a pivoted lever arranged to raise said spindle and carry said reel into engagement with said drum, or block, substantially as described.

7. The combination with a wire drawing drum, or block, provided with a lip B³, of a reel having a head provided with a shoulder D fitting said lip, whereby said reel is held concentrically with said drum, or block, and means whereby the rotary motion of said drum is imparted to said reel, substantially as described.

8. The combination with a wire drawing drum, or block, arranged to rotate about a vertical axis, of a reel placed at the lower end of said drum, or block, and coincident therewith, a vertically sliding plate F' provided with arms F⁴ and a spring with its tension applied to raise and sustain said sliding plate, substantially as described.

9. The combination with the drum, or block, of a wire drawing machine, arranged to rotate about a vertical axis, of a reel placed at the lower end of said drum, or block, and coincident therewith, said reel consisting of the heads D' and D², rods D⁴ connecting said heads, post F, sliding plate F' sliding on said post, spring F³ applied to raise said plate F' and arms D⁵ and F⁴, substantially as described.

Dated this 1st day of December, 1893.

CHAS. H. MORGAN.

Witnesses:

RUFUS B. FOWLER,
HENRY W. FOWLER.