(No Model.)

F. H. DANIELS.

MECHANISM FOR COILING WIRE RODS.

No. 445,965. Patented Feb. 3, 1891.

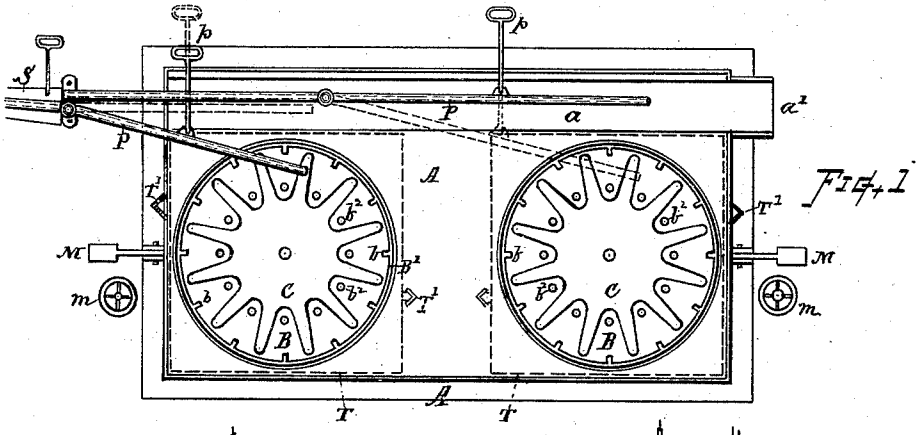


Fig. 1

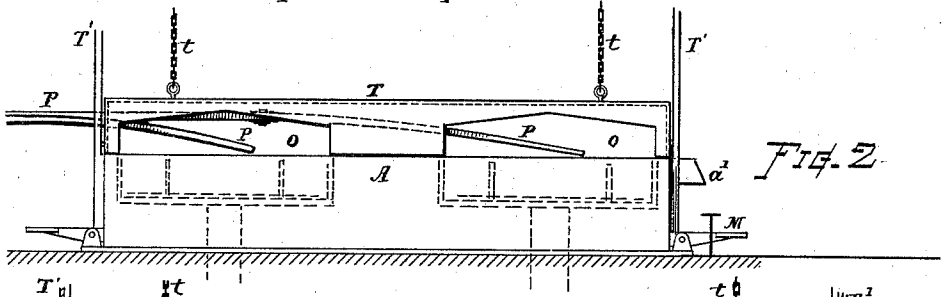


Fig. 2

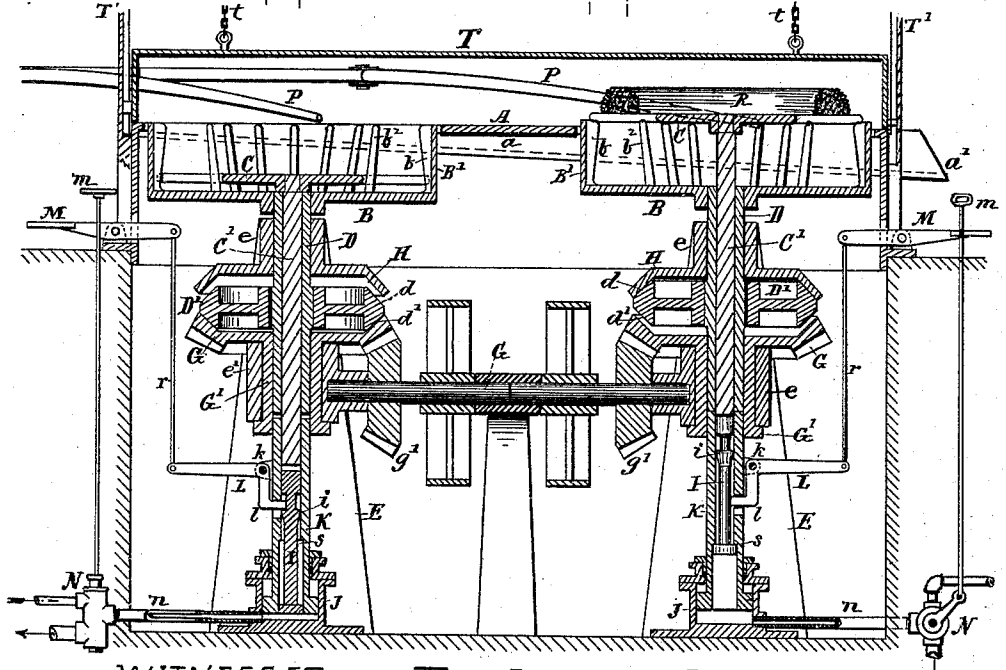


Fig. 3

WITNESSES

Ella P. Blems

A. P. Barton

INVENTOR

Fred H. Daniels

By Chas. H. Burleigh

Attorney

THE NORRIS PETERS CO., PHOTO-LITHO., WASHINGTON, D. C.

UNITED STATES PATENT OFFICE.

FRED H. DANIELS, OF WORCESTER, MASSACHUSETTS.

MECHANISM FOR COILING WIRE RODS.

SPECIFICATION forming part of Letters Patent No. 445,965, dated February 3, 1891.

Application filed June 26, 1886. Serial No. 206,323. (No model.)

To all whom it may concern:

Be it known that I, FRED H. DANIELS, a citizen of the United States, residing at Worcester, in the county of Worcester and State of Massachusetts, have invented certain new and useful Improvements in Mechanism for Coiling Wire Rods, of which the following, together with the accompanying drawings, is a specification sufficiently full, clear, and exact to enable persons skilled in the art to which this invention appertains to make and use the same.

The object of my present invention is to provide an efficient and practical mechanism for reeling or coiling hot wire rods as they come from the rolling-mill, and to afford facilities for directing the rods either onto the reel or so as to run out upon the table or floor; also, to provide a shield, guard, or cover to contain the reel mechanism and prevent accidents from the swinging end of the rod in case the same is not fully reeled into the coil; also, to provide an efficient mechanism for throwing the reels into and out of action by aid of hydraulic or pneumatic pressure, and facilities for discharging the coils of wire rod from the reels. These objects I attain by mechanism the nature, construction, and operation of which is explained in the following description, the particular subject-matter claimed being hereinafter definitely specified.

In the drawings, Figure 1 is a plan view of rod-reeling mechanism, illustrating features of my invention. Fig. 2 is a front view of the same. Fig. 3 is a vertical section through the reels drawn to a somewhat larger scale.

In referring to parts of the mechanism, A denotes a frame, table, or case having openings in its top within which the reels or rod-coiling receptacles B B are located, and being arranged in a pit, space, or chamber beneath said table and fully inclosed thereby, the top area only of the reels being exposed and the top line of the reel being level, or nearly so, with the surface of the table or platform. At the back of the reels a depressed space or trough *a* is formed along the table, which trough is preferably somewhat inclined downward toward its exit end *a'*, which opens above a receiving floor or platform, whereon the rods can be distributed when desired.

The rod-receptacles of the reels B are formed as rotatable tubs, or with cylindrical rims B', extending upward from their bottom plates, and at intervals along the inner surface of said rims B' vertical inwardly-projecting flanges or ribs *b* are arranged thereon, the upper part of the ribs extending inward farther than the lower part, as indicated. A series of upright pins or fingers b^2 form the center of the reel, which fingers preferably incline outward at their tops. The rod is coiled in the space between the fingers b^2 and ribs *b*, and the downward spread of the ribs and fingers permits the coils of rod to drop in the space instead of being held near the top, thus insuring the complete filling of the reel-space before the rod runs over the top.

C indicates a spider or radially-armed lifting-plate arranged within the reeling-receptacle with its arms extending across the space between the fingers b^2 and ribs *b*, and upon which the coiled rod R is supported.

The rod-receptacles are mounted on upright hollow shafts D, which are supported to revolve in bearings *e e* on suitable frames or standards E, and said shafts are respectively provided with a disk or friction-clutch wheel D', having upper and lower inclined frictional surfaces *d d'*. The upper bearing *e* carries a fixed friction-rim H, to match the upper surface *d* of the wheel D', and arranged in the under bearing *e'* is a sleeve G', which supports a gear G, having formed on or connected therewith a friction-rim, which matches the lower surface *d'* of the wheel D'. The shafts D are longitudinally movable in their bearings, and beneath their lower ends I arrange lifting and depressing mechanism, whereby the shafts, rod-receptacles, and disks D' can be raised and depressed, so as to bring either the upper or lower friction-surfaces *d* or *d'* into acting contact with its corresponding rim. When depressed, as at the left in Fig. 3, the frictional contact with the gear-G imparts rotary movement to the reel or receptacle B, and when elevated, as at the right in Fig. 3, the frictional contact with the stationary rim H stops the rotation and holds the reel or receptacle at a fixed position.

The spider or lifting-plate C is fixed on the end of a shaft or spindle C', disposed within the hollow shaft D in the manner indicated.

Beneath the foot of the shafts D and C', I

arrange a compound or telescoping lifting apparatus operated by hydraulic, steam, or pneumatic pressure, and consisting of a cylinder J, containing a piston or hollow plunger K, that extends up to and acts against the foot of the shaft D, and within said plunger is arranged a secondary or smaller piston or plunger I, that extends up to and acts against the shaft C′, the primary or outer plunger serving as a cylinder for the secondary piston, opening at its lower end into the main cylinder, so that the pressure exerted therein will act on both. The inner plunger is provided with a recess or lug, as at *i*, to engage with the end of a latch or locking lever L, whereby said plunger can be retained at its lower position. Said latch-lever is fulcrumed on the outer plunger, as at *k*, with its lower end *l* passing through an opening in the side and its outer arm connected by rod *r* with a treadle M, or other suitable operating mechanism, whereby the attendant can release the catch L when desired. The lug *i* is beveled at its lower side, or so formed that in the downward movement of the plunger I the catch-lever will automatically pass over the lug. A shoulder or stop is provided on the interior of the hollow plunger, as at *s*, to limit the upward movement of the plunger I and lifting-plate C. Suitable pipes *n*, with valve mechanism N, are provided for supplying the cylinders with water for exerting hydraulic pressure, said valves being fitted with operating-handles *m* at convenient positions. The mechanism is driven by gears *g′* on shaft G^2, which is provided with suitable driving-pulleys or other means for transmitting motion thereto from any suitable motor.

The rods are delivered to the reels through guide-pipes P, located above the trough *a*, which pipes are jointed and hinged in such manner that their delivery ends can be swung into line either with the coiling-receptacles or with the trough *a*, (see Fig. 11,) so as to deliver the rods into said receptacles, or so they will run out upon the floor at the end *a′* of the trough. Handles *p* or other suitable means are provided for moving the ends of the guide-pipes, as required.

The rod is introduced into the guide-pipes direct from the rolling-mill, (not shown,) a switch S being employed, when desired, to cause alternate rods to pass to the right or left reel.

A cover or inclosing casing T is arranged to inclose the ends of the guide-pipes and space above the reels in the manner illustrated, so that there will be no danger from the swinging of a loose end or loop of rod which from any reason may accidentaliy get loose, or is not closely coiled into the receptacles. Said cover T is provided with openings or doors O, through which to take out the coils of rod, and it is suspended from above by means of chains *t* or other means, so that it can be raised up at any time to allow access to the mechanism beneath it.

Guides T′ are provided in connection with the cover to prevent its swinging out of place as it is hoisted up and down by means of the chains *t* or lifting apparatus. Said guides preferably consist of rods, channel-bars, or angle-bars fixed in upright position in connection with the table A, with lugs on the cover T which engage with the said channel of the bar and retain the cover in proper relation and alignment as it moves up and down to and from the table or its supporting-platform A.

The operation of my invention is as follows: The pressure in the cylinder K being relieved, the plungers descend by weight of the superimposed mechanism, allowing the friction disk or wheel B′ to rest in contact with the gear G, as indicated at the left in Fig. 3. The gear being in motion imparts rotary action to the coil-receiver B, and the rod being led to said receiver through the pipe P is coiled in the annular space between the ribs *b* and fingers b^2, the coil resting upon the arms of the spider-plate C. When the coil is formed, the attendant opens the valve, letting the hydraulic pressure into the cylinder J, which lifts the plunger K, thereby elevating the shaft D and forcing the disk or friction wheel away from the gear G and into contact with the stationary rim H, as indicated at the right of Fig. 3, thus stopping the rotation of the receptacle. The pipe P is in the meantime swung back into line with the trough. The attendant then, by placing his foot in the treadle, releases the catch *l* from the secondary plunger I, and the pressure acting on said plunger forces up the spider-frame C, raising the coil of wire to a position above the fingers b^2, (see right-hand mechanism in Fig. 3,) so that it can be conveniently removed through the opening O. The pressure is then permitted to escape from the cylinder J, the spider-plate and receptacle descending to their former position. The operation is alternately repeated, one receptacle being unloaded while the other is being filled. In case of any accident or derangement of the mechanism during the coiling of the rod the pipe P can be shifted or swung back over the trough *a*, so that the balance of the rod instead of being tangled up in the reeling mechanism is directed out upon the receiving-floor, and the wasting of rods is thus avoided.

In lieu of making the cover or hood T for the reels with doors or openings O for discharging the rod, the cover may be made in two parts, or as a hood for each of the coiling-receptacles independently, and be arranged to be raised by the chain *t* or otherwise lifted from the platform to give access to the coiling-receptacle and permit the convenient discharge of the wire rod. Such single covers I have indicated by dotted lines in Fig. 1. These covers may be provided with a slot or opening in case it is not desired to extend them over the trough *a*, to permit the end of the guide-pipe to swing to and from the reel.

I do not herein claim the combination, with the reel or coiling receptacle, of a movable guard, hood, or cover and means for raising or lowering said hood; nor the combination, with the reel, of a direct conductor or guide and a switch-delivery guide for delivering the rod into the reel or directing it past the reel according as said guide is adjusted, these and other features of invention forming the subject of my Letters Patent, No. 373,965, of November 29, 1887; nor do I herein broadly claim a revoluble reel having a continuous peripheral rim and provided with an inner row of upright pins concentric with said rim, the latter being provided on its inner side with a series of inwardly-projecting ribs, for this forms in part the subject-matter of my Letters Patent, No. 415,448, of November 19, 1889.

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

1. The combination, with a rod-coiling receptacle having a cylindrical rim provided with a series of upright flanges and an inner series of pins or fingers, of a spider or plate having a series of radial arms extending across the space between said fingers and the outer rim-flanges for supporting the coils of wire rod, substantially as set forth.

2. The combination of the rod-coiling receptacle mounted on the revoluble shaft D, the friction disk or wheel D′, fixed on said shaft, the stationary friction-rim H, the revoluble friction rim and gear G, and mechanism for raising and depressing the shaft and friction-wheel, whereby said friction-wheel is brought into contact either with the stationary friction-rim H or with the friction-rim of the gear G, substantially as and for the purpose set forth.

3. The combination, with a rod-coiling receptacle or reel, of a spider or lifting-plate mounted on a central shaft which is supported and reciprocatively movable within the reel-supporting shaft and provided with means for elevating said shaft and plate, substantially as and for the purpose set forth.

4. The combination, with a rod-coiling receptacle or reel having a hollow supporting-shaft carrying a frictional actuating-wheel, and a lifting spider or plate having a shaft extending through and reciprocatively movable within said hollow reel-supporting shaft, of a pressure-cylinder containing a hollow primary piston or plunger acting against said reel-supporting shaft and a secondary piston or plunger acting against the shaft of said spider or plate, for the purposes set forth.

5. The combination, with a reel or coiling receptacle and a spider or lifting-plate having supporting-shafts that telescope one with the other, of a lifting mechanism comprising a pressure-cylinder with primary and secondary plungers adapted for acting on the respective shafts, and a catch device for retaining said secondary plunger when in depressed position in relation to said primary plunger, for the purposes set forth.

6. The combination, with the reel-shaft and lifting-spider shaft, of the pressure-cylinder, the hollow primary plunger, the secondary plunger provided with the inclined lug *i*, the locking-lever L, fulcrumed on said primary plunger with its end *l* extending through an opening into the primary plunger for engagement, with said secondary plunger, substantially as set forth.

7. The combination, with a table or platform having a longitudinal channel or trough, of a plurality of revoluble rod-coiling receptacles, a plurality of jointed laterally-adjustable guide-pipes, and mechanism, substantially as described, for stopping and starting the rotative action of said rod-coiling devices, for the purpose set forth.

8. The combination of a revoluble rod-coiling receptacle or reel, a stationary table or platform covering the reel-operating mechanism, and a removable hood or guard arranged over and about said reel and supported on said platform, and means for elevating and lowering said hood, substantially as and for the purpose described.

9. The combination, with a rod-coiling receptacle or reel-tub arranged to rotate with the top of its rim substantially level with a horizontal table, floor, or platform, of an elevating spider or plate disposed within said tub and adapted for lifting the coil of rod to a position above the level of said floor or platform to facilitate its discharge, substantially as set forth.

10. The combination of the coil-receptacle B, having inwardly-projecting ribs *b*, the series of pins or fingers b^2, and the lifting spider or plate C, having arms that radiate across the space between said fingers and ribs, substantially as and for the purpose set forth.

11. The combination of the rod-coiling receptacle or revoluble reel, the removable guard-hood T, guides T′ for retaining said cover in proper relation as it moves to and from the supporting-table, and means for elevating and lowering said cover, substantially as and for the purposes set forth.

Witness my hand this 21st day of June, A. D. 1886.

FRED H. DANIELS.

Witnesses:
CHAS. H. BURLEIGH,
ELLA P. BLENUS.