(No Model.)

2 Sheets—Sheet 1.

F. H. DANIELS.

APPARATUS FOR REELING WIRE RODS.

No. 290,216. Patented Dec. 18, 1883.

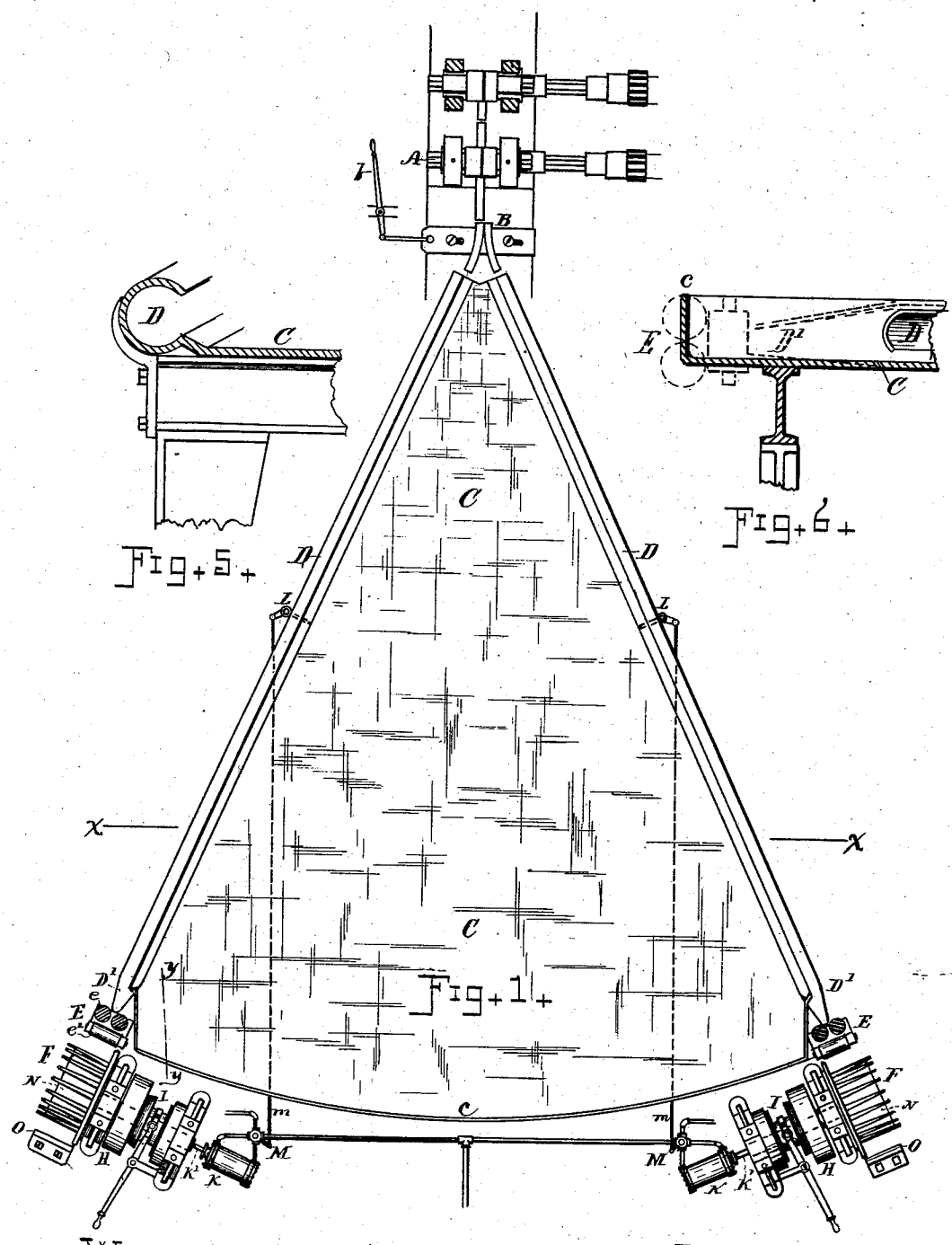


Fig. 1.

Fig. 5.

Fig. 6.

WITNESSES—

Geo. M. Rice 2d.

Austin W. Matthews

INVENTOR—

Fred H Daniels

By Chas. H. Burleigh

Atty.

N. PETERS Photo-Lithographer, Washington, D. C.

(No Model.) 2 Sheets—Sheet 2.

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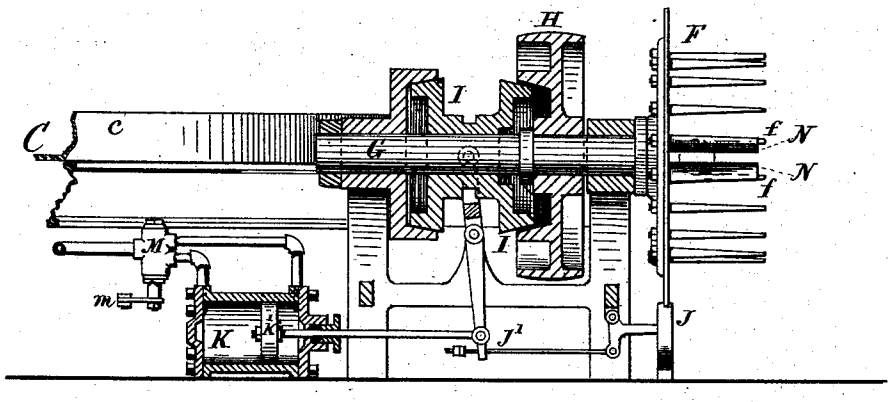


Fig. 4.

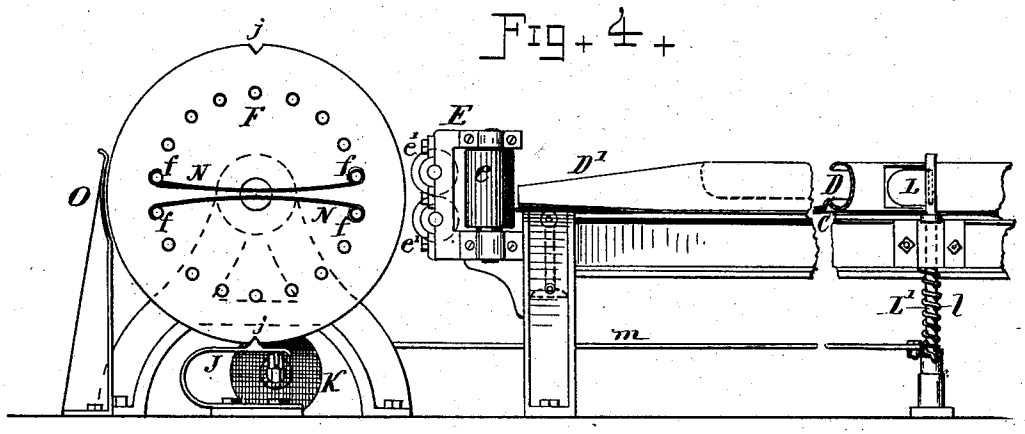


Fig. 3.

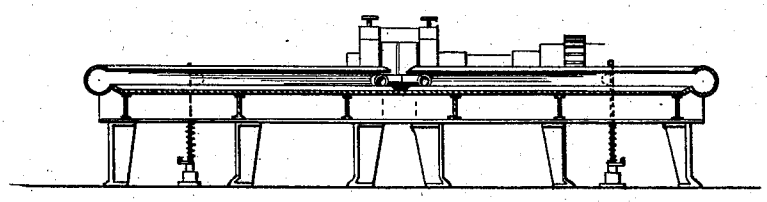


Fig. 2.

WITNESSES.

Geo. M. Rice 2d

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UNITED STATES PATENT OFFICE.

FRED H. DANIELS, OF WORCESTER, MASSACHUSETTS.

APPARATUS FOR REELING WIRE RODS.

SPECIFICATION forming part of Letters Patent No. 290,216, dated December 18, 1883.

Application filed June 21, 1883. (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 Apparatus for Reeling Wire Rods; and I declare the following to be a description of my said invention, sufficiently full, clear, and exact to enable others skilled in the art to which it appertains to make and use the same, reference being had to the accompanying drawings, which form a part of this specification.

The object of my present invention is to provide a practical and efficient reeling apparatus for continuous and other kinds of wire-rod-rolling mills; to afford means for receiving, supporting, and conducting the wire rod onto the reeling devices; to permit the rod to extend or distribute itself, and to obviate the necessity of employing an attendant for preventing snarls between the delivery-rolls and the reeling apparatus as the rod is projected from the mill, and to afford facilities for the automatic operation of the reeling mechanism. These objects I attain by mechanism the nature, construction, and operation of which are illustrated in the accompanying drawings, and explained in the following description, the particular subject-matter claimed being hereinafter definitely specified.

In the drawings, Figure 1 is a plan view of mechanism illustrating my invention. Fig. 2 is a transverse vertical section at line *x x*. Fig. 3 is a side view of the reel and portions of the table on larger scale. Fig. 4 is a sectional view of the clutch mechanism of the reel. Fig. 5 is a vertical section through one side of the table on large scale. Fig. 6 is a vertical section through the rear corner of the table at line *y*.

In the reference, A indicates the last pair of rolls of a wire-rod-rolling mill, in connection with which my improved apparatus is used.

B indicates a switching-guide for directing the rod to the right or left, as its end comes from the mill. Said switch is furnished with a hand-lever, *b*, to be operated by an attendant, as required.

C indicates a large triangular platform or table, some thirty feet long (more or less) by about fifteen feet wide at its foot, or end farthest from the mill, while its narrow end or the apex of the triangle, which is located in line with and following the rolls A and switch B, is made of just sufficient width to receive the rods from the switching-guides. The table C is supported at the required height by a suitable frame and standards, as indicated, and along the diverging edges of the platform are arranged covered gutters D or circular guide-channels, some six inches (more or less) in diameter, and formed, as shown in Figs. 2 and 5, with a space or opening along their side toward the table C, except at their farther ends, where they are completely closed over or formed into funnel-shaped tubes, D′, that terminate in front of a set of guiding-rolls, E, as indicated in Figs. 1 and 6. The covered gutters D extend direct from the switch B to the guide-rolls E at the respective angles of the platform, and said switch is arranged to direct the ends of the rod into one or the other of said gutters D, accordingly as it is adjusted, and thus cause the rod to run to the right or left side of the platform, as desired. The rolls E are preferably arranged, as indicated, in sets of four rolls, the two first rolls, *e*, being placed with vertical axes to receive the rod from the table or conducting-gutter, and the two latter, *e′*, being placed with horizontal axes for running the rod onto the reel. The rolls may be mounted free to be operated simply by the friction of the wire; or they can be provided with suitable gears and pulleys and be driven by power, as preferred.

F indicates the reels, which are formed of a series of pins supported in a suitable metal disk mounted upon revolvable shafts G in proper position to receive and wind up the rod as it comes from the tubes D′ through the guide-rolls E. A separate and independently-operated reel mechanism is employed at each rear angle of the table C. The reel-shafts are provided with pulleys H to receive the driving-belt from any suitable main or counter shaft, and with a clutch mechanism, I, for stopping and starting the reel, as required. A spring-catch or locking device, J, is provided for checking the movement of the reel and retaining it when at proper position for receiv-

ing the end of the rod. Said catch is in the present instance made to latch into notches *j*, formed in the edge of the reel-disk; but any device may be used for effecting equivalent result.

K indicates a pressure-cylinder, the piston K′ of which is connected for operating the clutch devices I on the reel-shaft. The cylinders K are provided with suitable valve mechanism, and may be located and arranged in any convenient position and manner for operating the clutches. Said cylinders may be piped and adapted for either steam, hydraulic, or pneumatic pressure. The catch-spring J may be connected with the piston-rod or clutch-shipper, as at J′, so that said latch will be thrown out of its notch when the reel is started and let into place again when the clutch is released.

L indicates a turn-plate or arm projecting into the gutter D and mounted on a suitable spindle, L′, that is connected by rod with the valve M of the cylinder K, whereby, when the wire rod, coming along the gutter, strikes said plate L, the valve M will be opened for giving pressure in the cylinder K and throwing in the clutch I for starting the reel. The turn-plate L or tripping device is located at such position in its relative distance from the reel that the interval of time required for the end of the rod to travel from thence to the reel will correspond as nearly as practical with the time required for the action of the shipping mechanism and the overcoming of inertia in the apparatus after the valve M is opened, so that the end of the rod will enter the reel immediately preceding the instant of its starting. In the present instance the actuating-plates L are located about half-way down the table-gutters D; but their position and the construction of the devices may be modified or changed, if desired or more convenient in any particular case. The spindle L′ is provided with a suitable spring, *l*, for returning the parts to place and shifting the valve M after the rod has passed the plate, thus rendering the mechanism automatic in its action and governed by the rods passing through. Metal plates N are arranged upon the pins *f f* at opposite central positions, which plates extend across the face of the reel F, as indicated, to guide the wire rod directly across the reel from the rolls E, and a guard or stop, O, is placed at the opposite side for stopping the end of the rod at a given position in relation to the reel.

For attendants on the apparatus when running there is required one man at each reel for removing the coiled rods therefrom and a boy to manage the switch at the head of the platform.

The operation of my apparatus is as follows: The wire rod, as it comes from the mill-rolls A, is by the switch B directed into one of the gutters D, and thence through the tubular end D′ and guide-rolls E, and between the plates N of the reel F to the stop-guard O. On its way down the gutter the end of the rod strikes the plate L and swings it to one side, and this action by the spindle L′ and rod *m* turns the valve M, giving pressure within the cylinder for moving back the piston and throwing the clutch I of the reel-shaft into engagement with the driving-pulley, and thus causing the reel F to be revolved. The parts should be so adjusted that the starting of the reel will be effected while the end of the rod is passing between the guard-plates N, or as soon as it reaches the stop O, so that no time may be lost, and the speed of the reel is proportioned somewhat to correspond with the speed at which the rolls deliver the rod upon the table C, it being desirable to run the reel as near the speed of the roll A as practical. Exact correspondence of speed being impossible in practice, and as some little time is required for the reel F to attain its maximum speed after it is started, I deem it best to give the reel an excess of speed over that of the finish-rolls A, so that the slack of the wire-rod, which may occur while the first part of the rod is run out and the reel is getting up its speed, may be by the reel taken up, or nearly so, before the end of the rod is reached. This excess of speed, however, should not be such as to cause undue strain upon the rod by pulling it from the rolls A near the latter end of the run. The open side of gutters D, being toward the surface of the table C, permits any slackness of the rod that may occur between the delivery-roll A and the reel to run out upon the platform free from the gutters D, and distribute itself in loops or curves upon the flat surface, which loops are subsequently straightened and drawn through the tubes D′ by the action of the reeling mechanism. The table C is provided with a high flange or border, *c*, along its foot to prevent the loops of the wire rod from working off from the edge in case of any disarrangement in the operation of the reeling mechanism. The first rod is wound upon one of the reels, and the switch is then shifted so that the second rod can be immediately wound upon the other reel, the attendant being meanwhile engaged in removing the coiled rod from the first reel, so that by the time the second rod is run onto its reel the first reel is in condition for the reception of the next rod, thus alternating from one to the other, giving ample time for clearing the reels and yet making no delay in the running of the rolling-mill.

If preferred, in lieu of operating the starting-clutches automatically by the pressure of the rod on plate L, said clutches could be provided with suitable shipper mechanism, to be operated by an attendant stationed at the foot of the table C or at other convenient position, where he could observe the movement of the rods as they come from the rolls.

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

1. The combination, with the finishing-rolls

in a wire-rod-rolling mill, of an iron table or platform provided with covered side gutters open toward the platform-surface for receiving the wire rods as they are delivered from the mill, conducting their ends and permitting the slack of the rod to distribute itself in loops upon the table-surface, and a reeling apparatus adapted for automatically receiving the end of the rod from said gutter and winding in the slack rod from said platform, as set forth.

2. The combination, with a wire-rod-rolling mill, of a triangular platform or table having covered gutters along its edges open toward the platform-surface, and a switching-guide for directing the rods into either the right or left gutter, substantially as set forth.

3. The combination, with a wire-rod-rolling mill, of the triangular platform provided with guiding-gutters along its edges, two rod-reeling mechanisms located at the respective angles of said table at the termination of said gutters, as shown, and means for directing the rod to the right or left reel, substantially as set forth.

4. The combination of the platform C, having an open gutter terminated with inclosed tubular end D′, and the guiding-rolls *e* and *e′*, arranged as shown for directing the rod in front of the reel, substantially as set forth.

5. The combination, with the triangular platform having guiding-gutters along its opposite edges, of the revolving reels, located at the respective angles of said platform, and mechanism, substantially such as described, for independently operating said reels, for the purpose set forth.

6. The combination, with a rod-rolling mill, of a platform or table having a guiding-gutter open at its side toward the platform-surface, and terminating in an inclosed tube at its farther end, a set of guiding-rolls located at the mouth of said tube, a revolvable reel for winding up the rod as it comes from the roll, and means for automatically starting and stopping said reel, as set forth.

7. The combination, substantially as described, of the triangular platform provided with directing-gutters at its sides, the reeling mechanism located at the angles of said platform for receiving the rod from said gutters, the clutch devices on the reel-shafts, the pressure-cylinders having pistons connected with said clutches, and means for actuating the cylinder-valves to give pressure at either side of the pistons, for the purpose set forth.

8. The combination, with the guiding-gutter D on the rod-receiving table, and the clutch-operating mechanism on the reel, of the turn-plate L, spindle L′, and valve-rod *m* for automatically actuating the valve M, as and for the purpose set forth.

9. The combination, with the reel F, of guiding-plates N, arranged across the face of the disk between the studs *f*, substantially as and for the purpose set forth.

10. The combination, with the reel F, provided with plates N, guide-rolls E, and the clutch-operating mechanism, of a spring-latch provided with means for engaging the reel at given positions, and having connection with the clutch-operating devices, whereby the latch is released when the clutch is thrown into action.

11. The stationary stop-guard O, in combination with the reel F, having guide-plates N, and the guide-rolls E, for the purpose set forth.

12. The combination, with the table C, having side gutters, D, of the foot-flange *c*, for the purpose stated.

Witness my hand this 19th day of June, A. D. 1883.

FRED H. DANIELS.

Witnesses:

CHAS. H. BURLEIGH,

S. R. BARTON.