

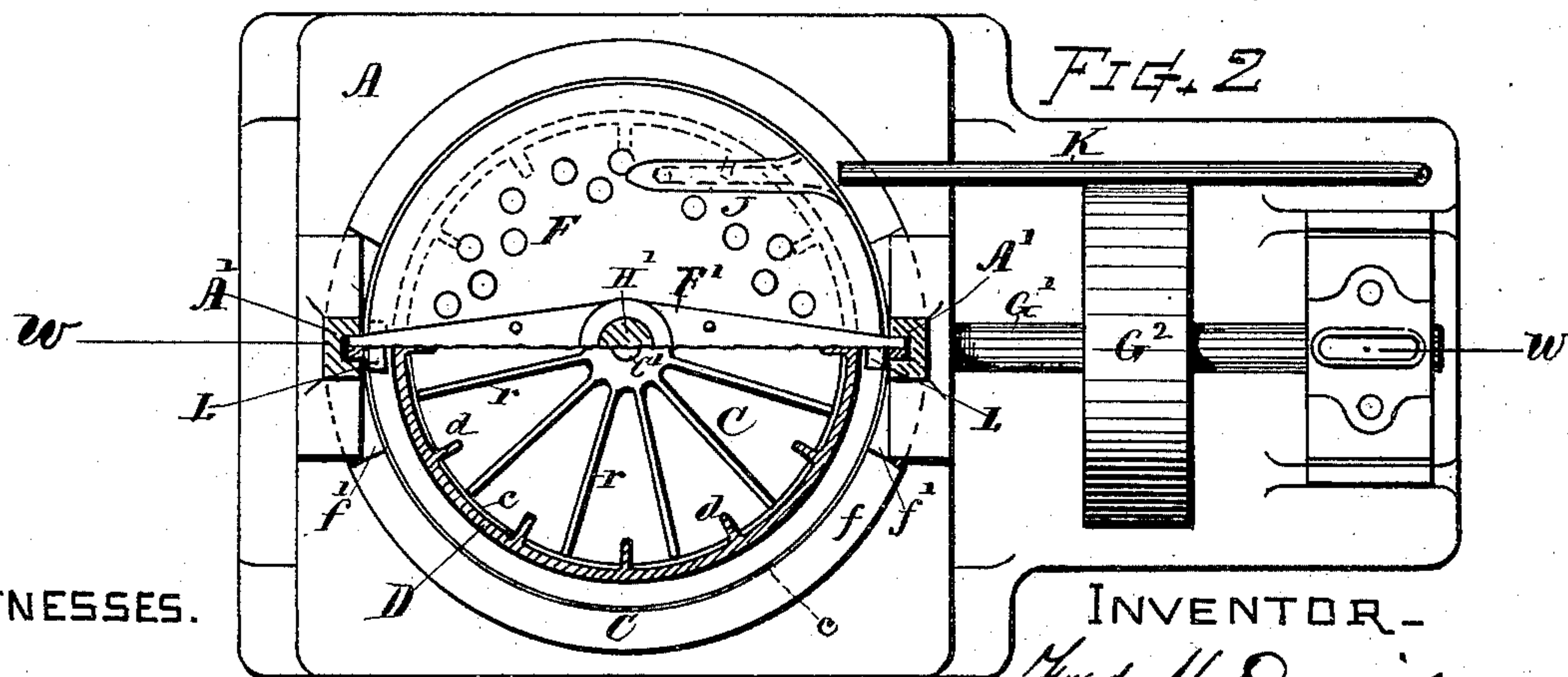
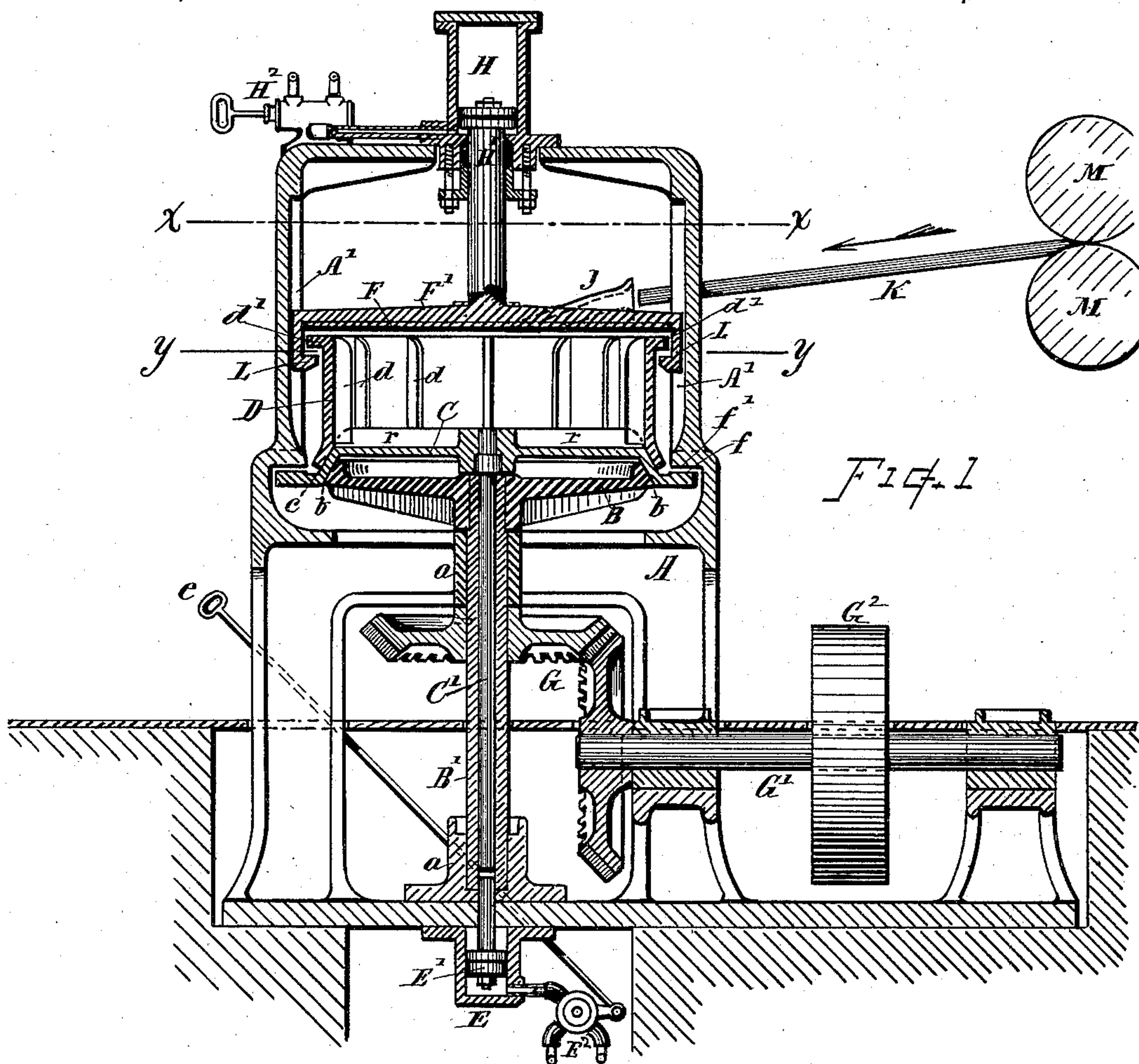
(No Model.)

F. H. DANIELS.

REEL.

No. 371,927.

Patented Oct. 25, 1887.



WITNESSES.

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REEL.

SPECIFICATION forming part of Letters Patent No. 371,927, dated October 25, 1887.

Application filed April 7, 1887. Serial No. 234,064. (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 Wire-Rod Reels for Rolling-Mills, 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 a reeling apparatus for coiling wire rods as fast as they are delivered from the rolling-mill, consisting of a revoluble reel or coiling-receptacle provided with a peripheral rim having on its inner surface inwardly-projecting ribs or flanges, said peripheral rim being arranged to engage with driving mechanism, from which it is detachable, and also arranged to be raised or lowered, as desired, for permitting access to each completed coil of wire as fast as produced.

Another object is to provide a reeling mechanism with a cap-plate or screen which closes the top of the coiling-receptacle for preventing any overfeed of the red-hot wire rod, said cap-plate being provided with a guiding-way, through which the wire rod is delivered into the reeling-receptacle at the proper angle and direction to insure the proper coiling of the rod.

Another object is to provide a reel having a non-rotatable cap-plate and a disconnected peripheral rim, combined with elevating devices, whereby the rim is lifted when the cap-plate is raised, while the rotatability of the rim is not interfered with when the parts are in depressed position.

Another object is to provide, in connection with the top of the reel, a piston, piston-rod, and hydraulic cylinder for operating the cap-plate and engaging-lugs for engaging with the peripheral rim for raising and lowering the same.

Another object is to provide a guiding way or ways for retaining the rim-engaging lugs and cap-plate in proper relation to the coil-supporting plate when raising and lowering the peripheral rim of the reel.

Another object is to provide, in a rod-reeling apparatus, a supporting-plate having upwardly-projecting ribs for supporting the coiled

rod above the plain surface of the plate, thereby affording a space under the coils for the convenient introduction of tongs or other discharging tools or discharging implements when removing the coils from the reel.

Another object is to provide a coil-supporting plate having a frictional engaging-surface for stopping the revolution of the reel, and conical friction-surfaces or equivalent means for engaging said plate, respectively, with the peripheral rim or cylinder of the reel and with the driving cone or surface of the revoluble operating-head.

Another object is to provide a reel having an unattached coil-supporting plate fitted with frictional engaging-surfaces for stopping and starting the same, and a hydraulic cylinder and piston, by aid of which power is applied through the spindle or supporting-shaft for bringing the stopping friction and the starting friction surfaces alternately into their respective engagements, and thus controlling the revolution of the coiling or reeling devices.

These objects I attain by mechanism the nature, construction, and operation of which are illustrated in the drawings and explained in the following description, the particular subject-matter claimed being hereinafter definitely specified.

In the drawings, Figure 1 is a vertical section of a wire-rod-reeling apparatus illustrating the nature of my invention. Fig. 2 is a horizontal sectional view, one part at line *x x* and the other part at line *y y*, Fig. 1.

In referring to parts, A denotes the supporting-frame.

B indicates a circular plate or head fixed to the upper end of a hollow upright shaft, B', that rotates in bearings *a*, supported on the frame. Rotary movement is imparted to the shaft B' and head-plate B by means of beveled gears G from the shaft G', whereon is arranged a pulley, G², for the driving-belt, or in other suitable manner. The plate B forms the operating-head or driving-plate of the reel, and its outer or peripheral surface, which is preferably made conical or upwardly and inwardly inclined, is fitted to give a frictional engaging-surface, as at *b*. Above said head-plate I arrange a coil-supporting plate, C, of larger diameter and having an inwardly-coned surface that matches the peripheral surface *b* of the head B, and with an upper cone-surface, *c*, that engages the base of the peripheral rim

or outer circle, D, of the coiling-receptacle, while the periphery of said supporting-plate is provided with a frictional surface, f , that works against frictional surfaces f' on the stationary part of the frame. The coiling-receptacle or reel is formed of the coil-supporting plate C, the unattached peripheral rim or cylinder D, and, in the present instance, is provided with a non-rotative cap-plate, F, which parts are disposed in the manner illustrated, the coil-supporting plate C resting upon the operating-head B, the circumferential rim D resting upon said supporting-plate, and the cap-plate suspended above the same.

The plate C is attached to the upper end of a shaft or spindle, C', that is disposed within the hollow of the shaft B', the shaft C' and plate C being rotatable or non-rotatable independent of the movement of the shaft B' and driving-head B. The top surface of the coil-supporting plate C is provided with upwardly-projecting radial ribs or flanges r , upon which the coil of wire rod is sustained at some distance above the plane of the plate.

Beneath the end of the spindle C' are arranged the hydraulic cylinder E and piston E', the rod of which extends upward within the hollow shaft B' against the foot of the spindle C', so that said spindle, together with the coil-supporting plate C, can by means of the hydraulic piston be raised and depressed for bringing the frictional surfaces of said plate respectively into engagement with the driving-head B at b , or with the stationary friction of the frame at f' , for starting and stopping the rotation of the coiling-receptacle. The action of the hydraulic piston E' is controlled by the valve E², which is provided with an operating-handle, e , disposed at any convenient location.

The peripheral rim or cylinder D of the coiling-receptacle is provided on its interior with inwardly-projecting flanges d . Its lower edge is made with a frictional bearing or engaging surface to match the frictional surface c on the coil-supporting plate C; or the parts may be provided with other equivalent intermatching engaging devices, whereby said peripheral rim, while being unattached, will be retained centrally coincident with said supporting-plate and be caused to revolve in unison therewith. Said peripheral rim D is provided with an annular outwardly-extending flange, d' , on which the lifting mechanism takes effect.

The non-rotatable cap-plate F is attached to a cross-head or supporter, F', that works up and down in guideways A' on the standards at the sides of the frame. Said cross-head is provided with under-locking lugs L, that extend beneath the annular flange d' and lift the rim when the cap-plate and cross-head are raised. Said lugs L are so constructed and disposed that they leave the flange free to revolve without interference when the cap-plate is depressed, but engage and lift the peripheral rim d away from the coil-supporting plate

C whenever the cap-plate is elevated or moved upward.

The cap-plate may be made solid in some instances; but I prefer to make it as an open-work screen, or with perforations, through which the attendant can observe the coiling of the rod while the reel is running, so that he may know whether the rod is being properly coiled or otherwise.

A hydraulic cylinder, H, is mounted at the top of the frame, the piston H' of which connects with the cross-head F' for raising and depressing the cap-plate, accordingly as pressure is let on or off from said cylinder by the valve H², which valve may be disposed in any desired position convenient for the operator.

The cap-plate F is provided with a guideway, J, disposed thereon at proper position for directing the wire rod into the receptacle and depositing it on the supporting-plate, so that it will be coiled by the rotation of the receptacle. Said guideway is fixed to the cap-plate, so as to rise and fall therewith as the cap-plate is lifted and depressed.

The rod is conducted from the rolling-mill M and delivered to the reel as fast as formed by a suitable guide-pipe, K, which terminates at the edge of the receptacle, or so as not to interfere with the upward and downward action of the cap-plate and delivering-guide J.

The detachable peripheral rim D, constructed for operation as herein set forth, may be employed without the non-rotatable cap-plate F, if desired, and the means for elevating said rim, substantially as set forth, may be of other construction from that herein shown for effecting the elevation and depression of the rim in equivalent manner to that described.

The rim or cylinder D may in some instances be made of upright bars, connected top and bottom, with annular flanges with open spaces between them, in lieu of making said rim as a solid shell or complete cylinder with inwardly-projecting ribs.

The operation of my apparatus is as follows: The plate B is kept constantly in motion by the driving mechanism. The coil-supporting plate C, when depressed or at the position shown in Fig. 1, engages the conical periphery of the plate B, and is caused to revolve therewith by the strong friction of the adjacent intermatching surfaces at b . The cylinder or rim D, resting upon the intermatching or conical frictional surface of the plate C, is also caused to revolve in unison therewith. The rod as it is delivered within the receptacle is coiled by the rotative action thereof. When the coil is complete, the operator opens the valve E² and the hydraulic pressure forces up the piston E' against the spindle C', lifting the plate C free from the head B, so that its frictional surface f will strike the stationary friction-surfaces f' of the frame, which latter act to stop the rotation of the supporting-plate C, the coil, and rim D. Pressure is then let onto the cylinder H for forcing upward the piston, which lifts the cross-head and cap-plate

F, and as said cross-head moves upward the lugs L engage the flange d' , and thereby lift the rim D free from the coil-supporting plate C to a height which permits access to the coil of wire rod, which rests on the radial flanges r on said supporting-plate, and which is then taken from the plate C by the attendant, who inserts his hook or handling-tongs between the radial flanges r and seizes the coil and draws it off at one side from beneath the lower edge of the elevated rim D, the flanges allowing the tongs to pass under the coil without interfering therewith. When the coiled rod has been removed, the valve H^2 is reversed and the rim and cap-plate are depressed or allowed to drop to their normal position. As the foot of the rim D meets the plate C it is centered by the conical frictional surfaces, and its upper flange, d' , is released by the lugs L, so that the rim is free to revolve with the plate C. The valve E^2 is then opened, thus allowing the plate C to drop, freeing the friction-surface f and bringing into contact the friction-surfaces on the driving-head B. The receptacle is thereby instantly put into rotative action, ready for receiving another coil of rod, and the operation may be again repeated.

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

1. A wire-rod reel having a peripheral rim unattached to the coil-supporting plate and retained for revolving therewith by intermatching frictional engaging-surfaces, substantially as set forth.

2. In a wire-rod-reeling apparatus, a coiling-receptacle provided with an unattached peripheral cylinder having on its inner surface inwardly-projecting flanges and fitted with intermatching friction-surfaces or equivalent means for engaging with the coil-supporting plate to rotate in unison therewith.

3. A wire-rod reel having a detachable peripheral rim, in combination with a power lifting mechanism and engaging devices, whereby said rim is raised or lowered, which devices permit revolution of said rim when at its normal position, substantially as set forth.

4. In a wire-rod-reeling apparatus, the combination of a coiling-receptacle having a detachable peripheral rim or coil-limiting circle, a non-rotatable cap-plate, and a lifting mechanism having engaging devices, whereby said peripheral rim and cap-plate are raised and depressed and the rim released to permit free rotation when the cap-plate is in a depressed position, substantially as set forth.

5. A wire-rod reel provided with a non-rotatable cap-plate having a guideway formed therethrough adapted for receiving the rod at or near the periphery of said cap-plate and for directing it into the coiling-receptacle, in combination with a revoluble coiling-receptacle and a delivery-guide which terminates adjacent to the periphery of the cap-plate, substantially as hereinbefore set forth.

6. In a wire-rod reel, a coil-supporting plate having a series of upwardly-projecting ribs

formed thereon for sustaining the coiled wire rod at some distance above the plane of the plate, substantially as and for the purpose set forth.

7. In a wire-rod-reeling apparatus, the combination, with the coiling-receptacle, of a cap-plate or screen provided with openings or perforations, for the purpose set forth.

8. In a wire-rod-reeling mechanism, a reel or coiling-receptacle provided with a rotatable coil-supporting plate having engaging-surfaces formed thereon, in combination with a stationary engaging surface or surfaces, and a rotating driving-head having a surface adapted for engaging said plate, and a power operated mechanism acting in conjunction with said coil-supporting plate for alternately bringing the engaging surfaces thereof respectively into contact with said driving-head, or with said stationary engaging-surfaces for starting and stopping the rotation of said coil supporting plate, substantially as set forth.

9. In a wire-rod-reeling apparatus, the combination of a coil-supporting plate, means for rotating and for stopping the rotation of said plate, an unattached peripheral cylinder retained on said supporting-plate by intermatching frictional surfaces, and means, substantially as described, for raising and depressing said cylinder, for the purpose set forth.

10. The combination of the rotatable driving-head, the coil-supporting plate engaging therewith when in depressed position, the peripheral rim engaging said coil-supporting plate by intermatching surfaces, the non-rotatable cap-plate, the reciprocating cross-head sustaining said cap-plate and provided with lugs that engage said peripheral rim, the cylinder and piston connected with said cross-head, and means for controlling the pressure within said cylinder, substantially as set forth.

11. The combination, with a reel or coiling-receptacle in a wire-rod-reeling apparatus, of a reciprocating cross-head, guides for directing movement of the same, a hydraulic cylinder, piston, piston-rod connected with said cross-head, and lifting and guiding devices or lugs attached to said cross-head engaging the peripheral rim of the receptacle, substantially as and for the purpose set forth.

12. The combination of the frame having friction-surfaces f' , the rotatable driving-head mounted on the hollow shaft, means for imparting motion to said shaft and driving-head, the coil-supporting plate having friction-surfaces top and bottom, its supporting-shaft disposed within the hollow driving-shaft, and the pressure-cylinder and piston arranged beneath said shaft, and means for controlling the pressure in said cylinder, substantially as set forth.

Witness my hand this 4th day of April, A. D. 1887.

FRED H. DANIELS.

Witnesses:

CHAS. H. BURLEIGH,
ELLA P. BLENDS.