

(No Model.)

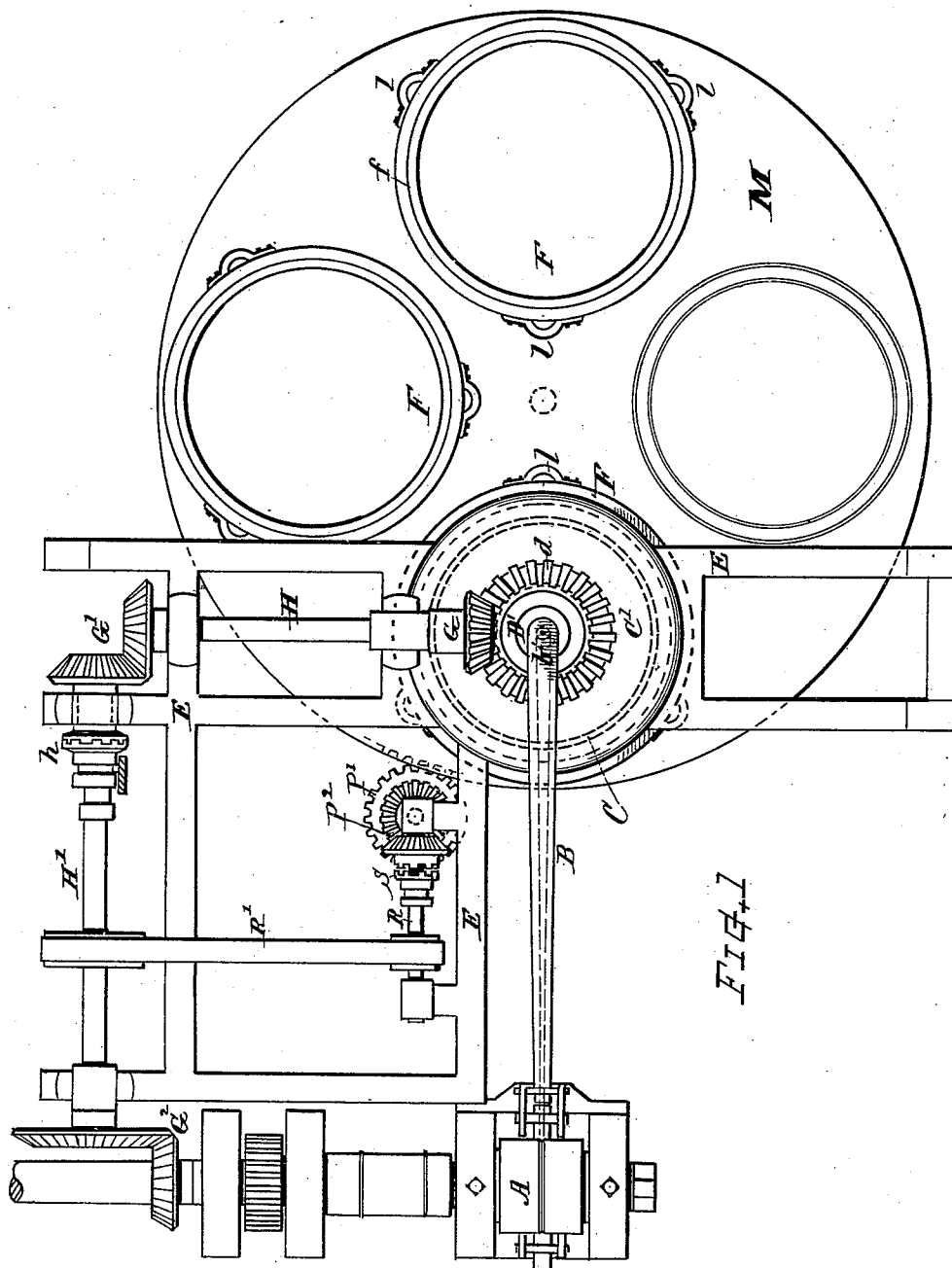
2 Sheets—Sheet 1.

E. S. LENOX.

APPARATUS FOR COILING WIRE RODS.

No. 351,839.

Patented Nov. 2, 1886.



WITNESSES

J. R. Barton
Charles S. Bacon

INVENTOR

Edwin S. Lenox
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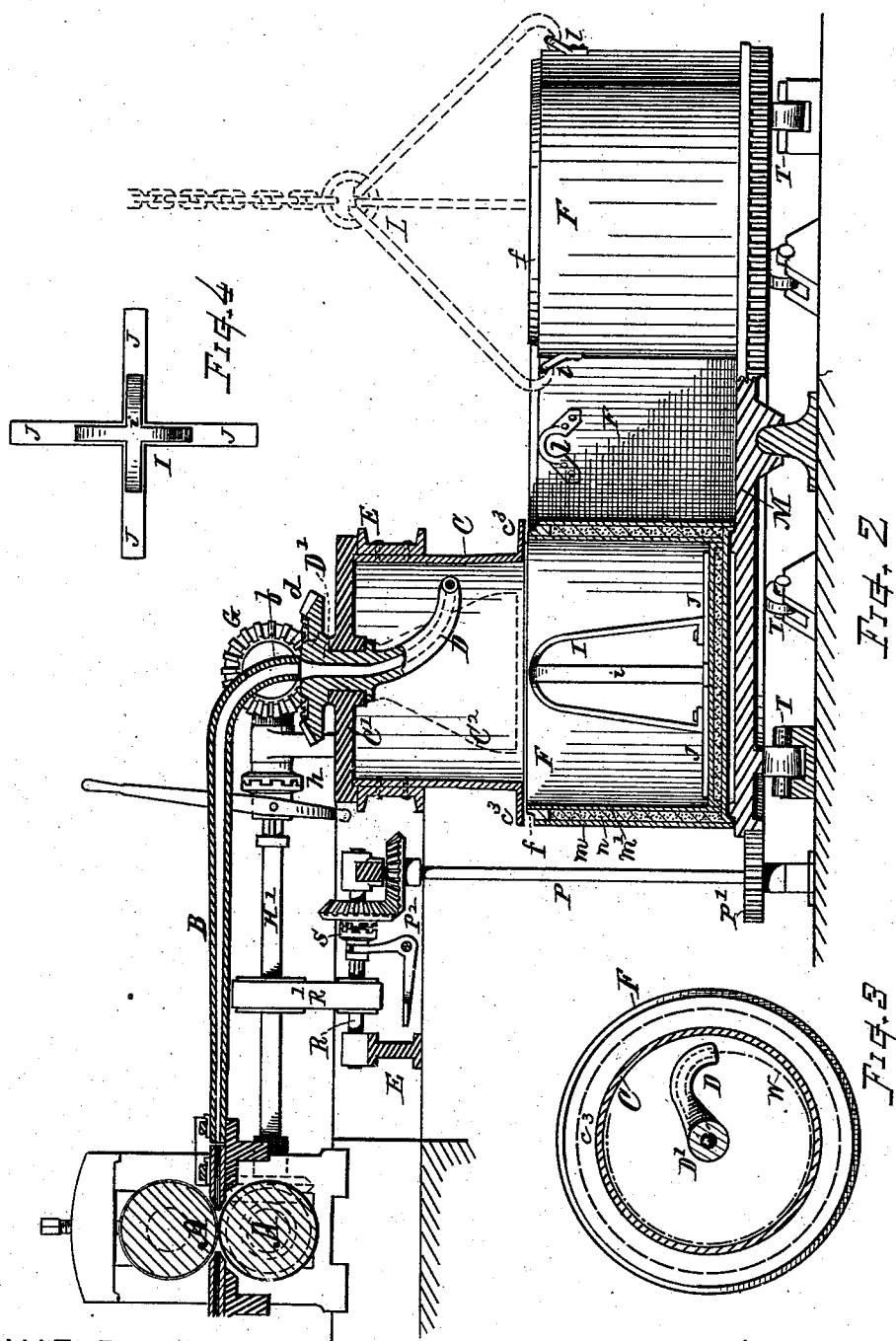
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INVENTOR

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UNITED STATES PATENT OFFICE.

EDWIN S. LENOX, OF WORCESTER, MASSACHUSETTS, ASSIGNOR TO THE
WASHBURN & MOEN MANUFACTURING COMPANY, OF SAME PLACE.

APPARATUS FOR COILING WIRE RODS.

SPECIFICATION forming part of Letters Patent No. 351,839, dated November 2, 1886.

Application filed January 6, 1886. Serial No. 187,754. (No model.)

To all whom it may concern:

Be it known that I, EDWIN S. LENOX, 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 Coiling and Treating 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.

My present invention relates to the construction and arrangement of delivering and receiving and coiling mechanism in an apparatus for automatically coiling hot wire rods as they come from a rolling-mill, the object being to provide facilities for coiling hot wire rods into portable tubs or onto receptacles which can be removed from the coiling-machine and deposited in a soaking pit or chamber for cooling by slow process, so that the rods will be left in soft condition or carried to the clearing-bath; also, to provide a tub or receptacle for containing the coiled rods adapted to retain the inherent heat of the rod for slow cooling process; also, to provide an automatic continuous-coiling mechanism of high efficiency of action.

The particular subject-matter claimed is hereinafter definitely specified.

In the drawings, Figure 1 is a plan view showing my improved coiling apparatus and its connection with the rolling-mill. Fig. 2 is a vertical sectional view of the same. Fig. 3 is a horizontal section of the coil-forming cylinder and delivery-guide. Fig. 4 is a top view of the spider-frame for supporting the coils of rod.

In referring to parts, A denotes the final set of rolls of the rolling-mill, by means of which the wire rods are formed, and said mill may be arranged to operate in any suitable well-known manner.

B denotes the tube or guide for directing the rod from the rolls to the coiling mechanism. Said guide is preferably made with increasing internal diameter as it recedes from the rolls, or enlarged near its downward-turned end b.

If desired, said guide can be formed in parts, the top being removable.

C indicates a circular guard or metal cylinder supported in upright position by the frame E, and surrounding the delivery-guide D. Said cylinder is open at the lower part, and at its upper end there is provided a revoluble part or head, D', which carries the curved guide or delivery nozzle D, through which the rod enters said cylinder from the guide B, which latter is curved downward at its end b, for directing the rod into an axial opening in the head D', as indicated in Fig. 2.

The revoluble head D' is mounted in or upon a suitable frame or plate, C', which preferably covers or closes the upper end of the guard-cylinder C. Said head is provided with gear-teeth d, and is rotatively operated by means of suitable gears, G, G', and G'', and shafts H H', connecting for operation with the rolling-mill mechanism, and adapted for driving the tubular guide or delivery nozzle D at such speed as will substantially correspond with the speed of the rods as they issue from the rolls A. A suitable clutch, h, is provided, as shown, or at some convenient part of the mechanism, for disconnecting the driving-gearing.

The end of the delivery-guide D is curved backward from the direction of its rotation, as indicated in Figs. 2 and 3, so that it will deliver the rod W against the inner surface of the guard rim or cylinder C (see Fig. 3) in an easy and unobstructed manner, and so as to form coils of the rod of a size corresponding to the inner diameter of said cylinder at the position of the guiding-nozzle, which coils fall downward and out from the lower end of the cylinder as additional coils are formed above them. The lower end of the cylinder may be slightly enlarged in diameter to facilitate the dropping of the coils.

If desired, a central bell, cylinder, or cone, as indicated by dotted line C'', may be arranged within the cylinder C, to prevent any possibility of a coil winding or drawing across the central space within the circle of motion of the guide-tube D. It is not, however, intended to employ this bell or cone in all cases. An

outwardly extending flange, e' , is preferably formed about the lower end of the cylinder C, although said flange is not absolutely essential, and may be in some cases modified and in some cases omitted, if desired.

F indicates a portable tub or receptacle for containing the coils of hot wire rod. Said tub when receiving the rods is arranged beneath and coincident with the cylinder C, so that the coils of rod as they drop from the lower open end of said cylinder will fall in proper order within the tub. The inner diameter of the tub F is made somewhat greater than that of the cylinder C, and its depth is such as will contain the desired quantity of rods—say, for instance, from two to four feet, more or less. The flange e' serves to cover the annular space where the top of the tub is larger than the cylinder, but retains the heat.

Within the tub F is placed a spider or frame, I, having a center or part about which the coils are deposited. This frame and guard may be of any suitable construction, or, as shown in the present instance, made as a cone of upright bars, z , attached to extended arms J at the bottom, upon which the coils can rest. This frame, together with the coils of rod contained thereon, can be lifted bodily out of the tub F when it is desired to remove the charge of coiled rods therefrom.

The tubs F are preferably jacketed or formed, as indicated in Fig. 2, with an outer and inner plating of sheet-iron, as m m' , between which there is a space, n , filled with ashes, mineral wool, fire-clay, or other refractory or non-conducting substance, so that the heat will escape but slowly. In the present instance said tubs are provided with top and bottom flanges, f' , or formed so that one can be set upon another in piles or stacks. The tubs are also provided with suitable ears, l , for connecting the grappling devices L (see dotted lines, Fig. 2) of a crane or hoist when lifting and moving them, as required.

M indicates a revoluble table adapted for supporting a series of tubs, F, and for consecutively carrying them to positions beneath the cylinder C. Said table may be provided with rings or guides t , for facilitating the placing of the tubs thereon in proper position. The table is preferably mounted on rollers or trucks T, and furnished with suitable gearing for rotating it as desired. In the present instance the table-operating mechanism consists of the shaft P, gears P' and P'' , and the counter-shaft R, operated by a belt, R' , from the shaft H or other convenient motor. A suitable clutch mechanism, S, is arranged in connection therewith for throwing the table-gearing into and out of action. Any other suitable arrangement of gears may be employed for revolving the table.

In the operation of my improved apparatus, the rolls A and delivery-guide D being in motion, the rod as it issues from the rolls passes through the guide B and down through the

guide D, which latter delivers the rod along the inner surface of the guard-cylinder C, thereby forming the rod into coils, which continually fall from the open lower end of the cylinder into the tub F. When a sufficient quantity of rods have been deposited in a tub, the table is partially revolved, so as to swing the filled tub from beneath the cylinder C and an empty tub into position thereunder. The grapplings of the crane are then connected to the tub, which, with its contained rods, is deposited in a soaking-pit or other suitable position for slowly cooling the rods; or, when desired, the rods can be hoisted from the tub by means of the frame I. A reciprocating table may be employed for carrying the tubs to and from position in lieu of the rotating table, if preferred.

In case it is not desired to subject the rods to slow cooling process within the tubs, the coil-forming apparatus may be employed for depositing the rods upon the spider-frames I without using the tubs, said frames containing the rods to be then taken to the cleaning-baths.

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

1. The combination, substantially as described, of a stationary circular guard or cylinder open at its lower end, and a rotating guide, through which the rod is delivered against the inner surface of said guard, to form coils which drop from the guard in successive order, as set forth.

2. In apparatus for coiling hot wire rods, the combination of a rotating delivery-guide, a cylindrical guard surrounding said delivery-guide and open at its end, and a tub or receptacle of larger internal diameter than said guard thereunder, to receive the coils of rod as they fall from said cylinder, substantially as set forth.

3. In apparatus for coiling wire rods, the combination, substantially as described, of a stationary guard-cylinder open at its lower end, a guide leading from the reducing-rolls thereto, a rotating delivery-guide within said cylinder, and a portable tub arranged beneath said cylinder, for the purposes set forth.

4. In apparatus for coiling wire rods, the combination, substantially as described, of a stationary guard-cylinder open at its lower end, a tubular guide leading thereto from the reducing-rolls, a delivery-guide rotating within said cylinder, a series of portable coil-receptacles or tubs, and a platform supporting said receptacles, arranged to successively carry them beneath said cylinder, for the purpose set forth.

5. The combination, with the reducing-rolls in a rod-rolling mill, of a stationary circular guard or cylinder, a delivering-guide rotating therein, a guide-pipe leading from the rolls thereto, a rod-receptacle, and a removable central frame for supporting the coils of rod, substantially as set forth.

6. A portable rod receptacle or tub composed of a metal exterior and inner casing, with a lining or filling of refractory heat-resisting non-conducting material, and having
5 its upper and lower rims adapted for stacking one upon another, for the purposes set forth.
7. The combination, with the guide D, cylinder C, and tub F, of larger diameter than

said cylinder, of the outwardly-extended flange c^3 , for the purpose set forth. 10

Witness my hand this 1st day of January, A. D. 1886.

EDWIN S. LENOX.

Witnesses:

CHAS. H. BURLEIGH,
S. R. BARTON.