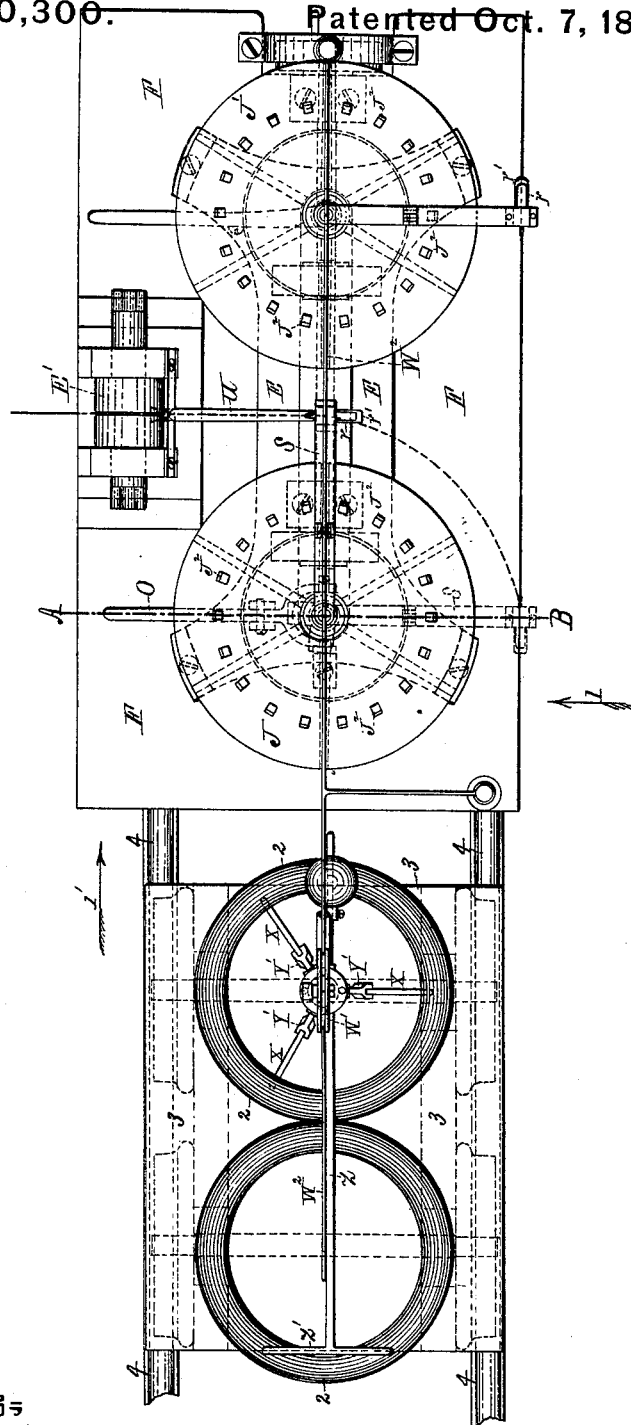


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Reeling Mechanism for Rod-Rolling Machine.
No. 220,306. Patented Oct. 7, 1879.

FIG. 1.



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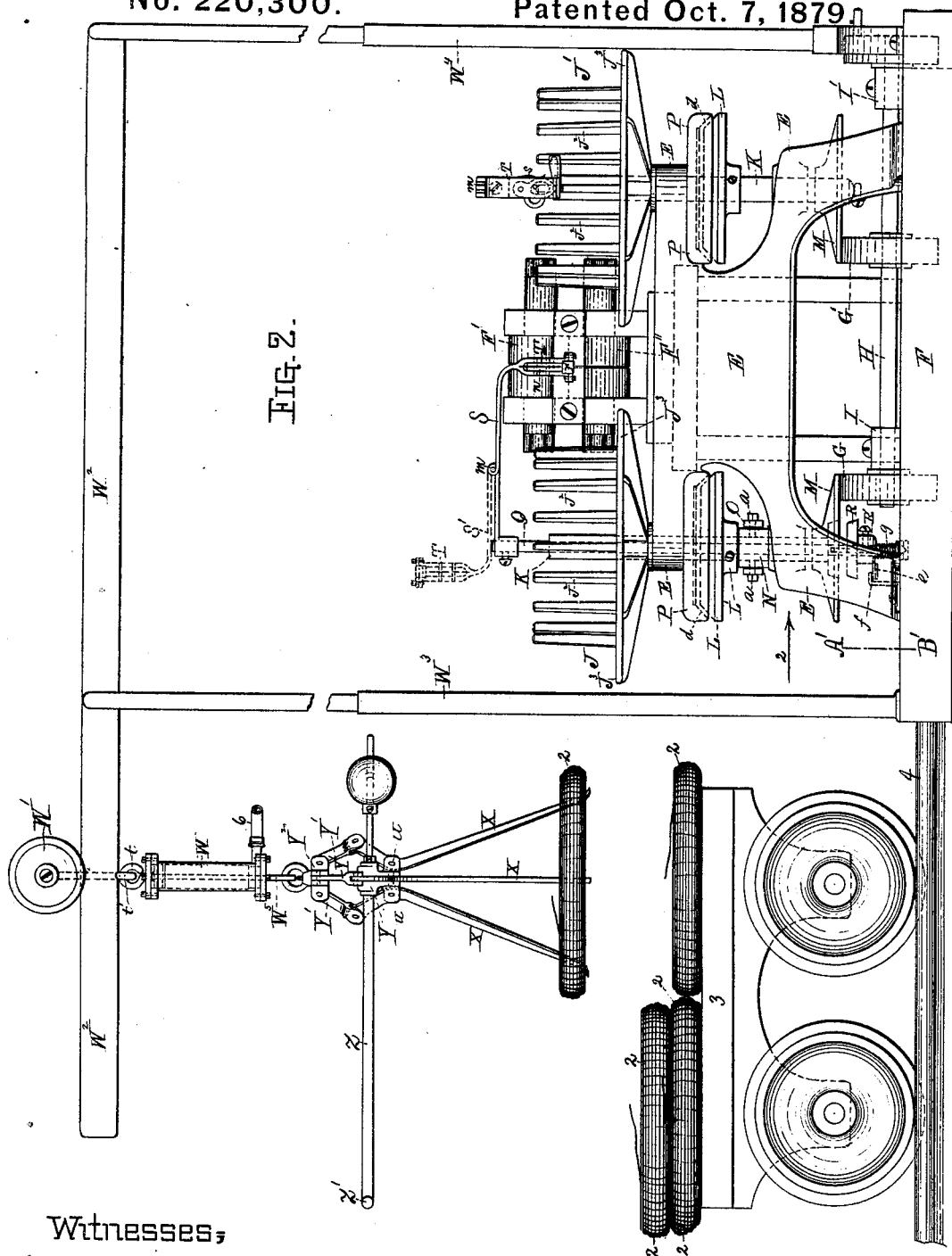
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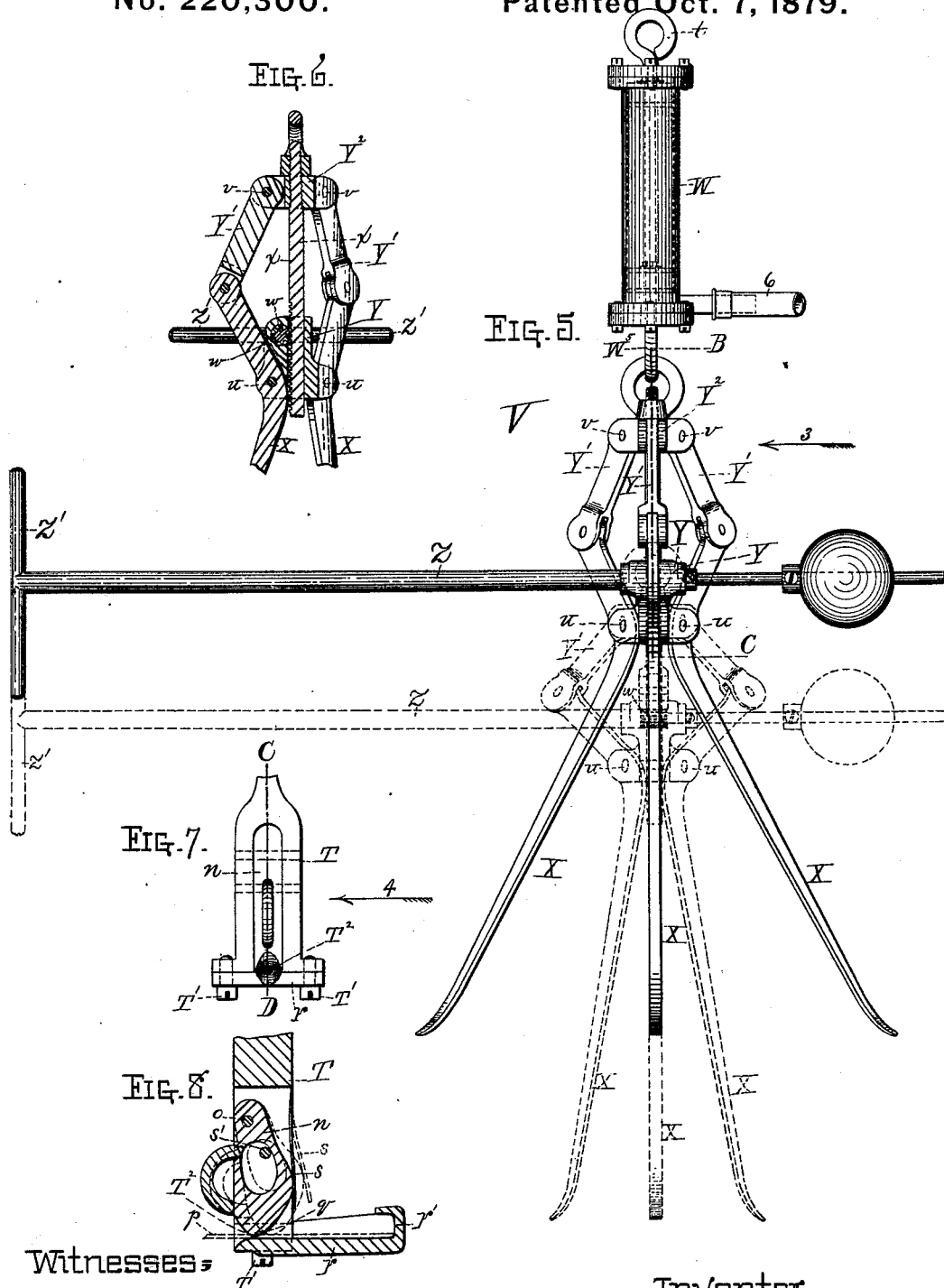
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UNITED STATES PATENT OFFICE.

CHARLES H. MORGAN, OF WORCESTER, MASSACHUSETTS.

IMPROVEMENT IN REELING MECHANISMS FOR ROD-ROLLING MACHINES.

Specification forming part of Letters Patent No. **220,300**, dated October 7, 1879; application filed January 22, 1879.

To all whom it may concern:

Be it known that I, CHARLES H. MORGAN, of the city and county of Worcester, and Commonwealth of Massachusetts, have invented certain new and useful Improvements in Reeling and Delivering Mechanisms for Rod-Rolling Machines to facilitate the coiling and removal of the metal rod after it leaves the finishing-rolls; and I do hereby declare that the following is a full, clear, and exact description of the same, reference being had to the accompanying drawings, forming a part of this specification, and in which—

Figure 1 represents a top or plan view of my said improved reeling and delivering mechanism for rod-rolling machines, the last set of finishing-rolls of a continuous or other rod-rolling mill, and also a car or truck being shown to more clearly illustrate my said invention, hereinafter more fully described. Fig. 2 represents a side view of the parts shown in Fig. 1, looking in the direction indicated by arrow 1 of the same figure. Fig. 3 represents a central vertical transverse section through one of the reels of the machine, taken on line A B, Fig. 1, looking in the direction indicated by arrow 1' of the same figure. Fig. 4 represents a portion of the device, hereinafter more fully described. Fig. 5 represents a side view of the expanding, rod-lifting, and carrying device, hereinafter more fully described, the same being shown by full lines in its most elevated position, with its arms expanded or thrown out, and, by dotted lines, dropped down into its lowest position, with its arms contracted or drawn in. Fig. 6 represents a central vertical section through a portion of the rod lifting and carrying device, taken on lines B C, Fig. 5, looking in the direction indicated by arrow 3 of the same figure. Fig. 7 represents a front view of the rod catching and holding device, hereinafter more fully described; and Fig. 8 represents a central vertical section through the rod catching and holding device, taken on line C D, Fig. 7, looking in the direction indicated by arrow 4 of the same figure.

To enable those skilled in the art to which my invention belongs to make and use the same, I will proceed to describe it more in detail.

In the drawings, the parts marked E represent the frame-work of the machine, which is arranged and secured upon flooring F. The machine in this instance is driven by means of friction driving-pulleys G G', secured upon a horizontal driving-shaft, H, which is arranged to turn in bearings I I', secured to flooring F; but, if preferred, said driving-power may be imparted by means of bevel friction or toothed gears, or in any other suitable and convenient manner.

The left-hand reel (shown in Fig. 2) and the parts connected therewith will now be described.

Upon an upright hollow shaft, K, which is fitted loosely, so as to slide up and down and also turn in its bearings, formed in frame-work E, is arranged and secured reel J, bevel friction-wheel L, (which acts as a brake to stop said reel J, as hereinafter described,) and friction wheel or pulley M. It will, therefore, be seen that the combined weight of the parts J, K, L, and M, with the latter bearing upon friction driving-pulley G, is amply sufficient to produce the necessary frictional driving-power to turn reel J in coiling the wire rods. By changing the position of the driving friction-wheels the speed of the reels can be regulated at pleasure.

Friction-brake L is for the purpose of quickly stopping the reel when a coil has been completed upon the same and ready for removal, and is operated as follows: A collar, N, is loosely fitted upon hollow shaft K, between the bottom of hub L' of friction-brake L and the top of frame-work E below, and the ends of a forked lever, O, are hinged at the points *a a* to said collar N. Said lever O is fulcrumed at the point *b* upon standards *c c*, which constitute a part of frame-work E. Thus it will be seen that by depressing the outer end of lever O collar N will be brought to bear upon the under side of the hub of friction pulley or brake L, and friction-pulley M thereby raised off of the friction driving-pulley G. At the same time that pulley M is raised off of driving-pulley G the beveled surface of friction-brake L is forced up against the beveled surface *d*, formed in the under side of the part P of frame-work E, and the reel thereby quickly stopped.

By the above-described arrangement the necessity of unshipping the driving-power from the whole machine is obviated, which is of considerable practical advantage, since it allows the other reel to continue to turn without interruption, thereby entailing but little or no loss of time.

It will be understood that both reels are to be operated in the same manner; but for convenience I have only shown one fully provided with all the operating mechanism.

It will also be observed that by employing two reels instead of one much time is saved, as a coil can be forming upon one of the reels at the same time that the one previously formed upon the other is being removed to the car, truck, or other receptacle provided to receive it, as hereinafter more fully described.

As the reels are arranged upon the rear or delivering side of the finishing-rolls, and equidistant from the center thereof, the swinging arm of each can be quickly thrown into position to alternately seize and coil the rod.

A small upright shaft or spindle, Q, is arranged to slide up and down and also to turn in hollow shaft K. Upon the lower end of said spindle Q is secured a bevel friction-pulley, R, provided with a hub, R', which in turn is provided with a flange or projection, *e*, which is arranged to catch under a latch, *f*, secured to flooring F.

Driving-power is imparted to friction-pulley R and spindle Q to turn arm S, secured upon the upper end of said spindle, by the beveled surface of friction-pulley R being forced up by a spiral spring, *g*, against a correspondingly-beveled surface, *h*, formed in the under side of friction wheel or pulley M. (See Fig. 3 of the drawings.)

The lower end of spindle Q is made hollow, as represented at Q', so that a smaller spindle, Q'', may fit into the same and allow the former to work up and down, as hereinafter described. The lower end of spindle Q' is provided with a conical-shaped head, *k*, which rests and turns upon a metallic piece, *k'*, arranged in a socket formed in flooring F. Spiral spring *g* is held in place between the shoulder *l* of said conical head *k* and the under side of hub R' of friction-pulley R.

Arm S is made jointed, as shown at *m*, for the purpose of allowing it to be swung up and over out of the way in removing a finished coil, as represented by dotted lines S', Fig. 2 of the drawings.

The head T of arm S is provided with a rod seizing and holding device, which is constructed as follows, (see Figs. 7 and 8 of the drawings:) A swinging friction latch or dog, *n*, hinged at the point *o*, is so formed and arranged that when a wire rod, *p*, (shown by dotted lines, Fig. 8,) is inserted or runs between the lower rounded end, *q*, of said dog *n* and the part *r*, secured to the part T by means of screws or bolts T' T', it swings back, as represented by dotted lines, so as to allow the end

of the rod to pass into the head T and strike the socket end *r'* of the part *r*, where it is securely held until removed by the operator, as hereinafter described.

Spring *s*, it will be seen, presses the latch or dog *n* down upon the rod, so that it will catch when said rod is drawn taut, and pin *s'* simply governs its forward-and-backward swing.

The reel having been put in motion, and the billet to be rolled having been properly heated preparatory to being passed through the rolling-mill, the operator enters one end of the heated billet into the receiving-rolls, after which the operation of rolling the billet into a rod proceeds in the usual manner.

The friction-wheels G G' may be driven by power applied in any suitable manner to their respective shaft or shafts.

The end of the metal rod can be easily removed from head T after the operator has simply forced back dog *n*, as indicated in dotted lines, Fig. 8, thereby releasing its hold upon the end of the rod.

The operation of catching, holding, and coiling the wire rod rolled from a billet after it passes the finishing-rolls F' F'' upon one of the reels may be briefly summed up thus: Arm S is first placed in the position represented by full lines, Figs. 1 and 2 of the drawings, with the end of guide-pipe U in the mouth T² of head T, and flange or projection *e* under latch *f*. (Shown by dotted lines, Fig. 2, and full lines, Fig. 4.) The wire rod now passing forward from between the finishing-rolls F' F'' and through guide-pipe U, enters the head T of jointed arm S, passing under swinging dog *n*, strikes the end *r'* of the part *r*, and forces said arm forward, consequently turning shaft Q, thereby disengaging flange *e* from the action of latch *f*. Spring *g* then forces friction-pulley R up against friction-pulley M, thereby giving the same rotary motion to arm S in coiling the wire rod as is given to reel J by driving-pulley G.

The rolling of the billet having been completed, and the wire rod rolled therefrom having been coiled or wound upon reel J, the reel J and arm S are stopped by raising friction-pulley M off of the driving-pulley G by means of lever O, as before described, and the finished coil removed, as hereinafter more fully explained.

The operation of sliding flange or projection *e* from under latch *f* may be facilitated by securing a small friction wheel or roll upon the end of said flange.

If preferred, instead of a small spindle, Q'', and spiral spring *g*, for forcing friction-pulley R up against pulley M, the lower end of shaft Q may be provided with a conical point resting upon the end of a weighted lever, a projection on said lever working in a groove formed in the lower end of the shaft, whereby the operator can easily and quickly depress said shaft for the purpose of bringing flange *e* under catch *f* again, preparatory to repeat-

ing the operation of rod-coiling, as before explained.

The reels are provided with a wide firmly-supported base, J^3 ; consequently there is no danger or liability of any portion of the rod-coil dropping off, and thereby interfering with the proper coiling of the rod and its removal from the reel.

V represents the rod lifting and carrying device of the machine, which is arranged, constructed, and operated in the following manner:

The device, in this instance, is represented as being raised and lowered by hydraulic pressure. A cylinder, W, is suspended by means of a hook, t , and connecting-link t' upon the axis of wheel or truck W^1 , which travels back and forth upon an elevated track, W^2 , supported upon standards W^3 W^4 . To the lower hooked end of piston-rod W^5 is suspended the coil-grappling portion of the device, which is provided with expanding and contracting arms X, hinged at the points u upon a central supporting-piece, Y, and at their upper ends to the ends of hinged link-pieces Y^1 , which, in turn, are hinged at their upper ends at the points v to another central supporting-piece, Y^2 .

The device is operated to contract and expand its arms X by means of a balanced lever, Z, upon which is formed a pinion, w , which works in a rack formed in the vertical bar x , secured to the part Y^2 .

When it is desired to remove a finished coil from either of the reels the attendant first propels the device over the center of the reel from which the coil is to be removed, when he then lowers it, with the arms contracted, as represented by dotted lines, Fig. 5 of the drawings, then expands said arms so as to grasp the coil, as represented by full lines, Figs. 2 and 5, by turning handle Z' of balanced lever Z, after which he then raises it with the coil supported upon the ends of arms X, and propels it to the point at which it is to be dropped upon the car or truck placed underneath to receive it. He then lowers the device and contracts the arms, and the coil is allowed to drop upon the car 3, arranged to run upon the track 4, leading from the finishing end of the mill, as indicated in the drawings. (See Figs. 1 and 2.)

If preferred, the lifting-arms X may be arranged to take hold of the coils 2 from the outside instead of from the inside, as shown in the drawings.

Although I have represented the device as being raised and lowered by hydraulic pressure, any other suitable method may be employed, if preferred, without departing from the principle of my invention; and instead of supporting track W^2 upon standards W^3 W^4 the same may be supported from above, if desired, by any suitable and convenient mechanism.

Piston-rod W^5 in this instance is provided with a head which works in the cylinder W, and which head is elevated to lift the rod-coils

2 from the reels by water allowed to pass through the pipe 6, connected with cylinder W, and so arranged that the water in passing in will enter between the lower head of cylinder W and the under side of the piston-head, attached to piston-rod W^5 .

From the foregoing description it will be seen that by my invention a wire rod may be seized and properly coiled upon one of the reels of the machine, then removed from the latter even while in a red-hot state, and placed upon a car, truck, or other receptacle provided to receive it in a very quick and expeditious manner, and that, too, without endangering in the slightest degree the life or limb of the attendant or attendants in charge of the same, which latter objection has been very great in reels heretofore used, where the rod is caught and conducted to the reel by hand.

Another practical advantage of my invention is that, by arranging the reels upon perpendicular instead of horizontal shafts, the rod-receiving arms J^2 in said reels may be made more inclined toward the center, thereby enabling the coils of wire rod to be more easily removed, while at the same time they are effectually prevented from falling off of the same, as is often the case when coiling rods upon reels arranged upon horizontal shafts.

Again, it will be observed that by my invention two reels and rod-guiding mechanism are so combined with a set of finishing-rolls of a rolling-mill as that the finished rod, which is delivered from the mill with great rapidity, instead of being allowed to run out upon the ground for fifty or a hundred feet before the attendant can seize the end and commence the reeling operation, is automatically guided at once to the reel upon which it is to be reeled or coiled, thus saving the expense of several attendants, while at the same time insuring the more perfect coiling of the rod, and obviating the liability to accidents, both to the rod and attendants, incident to the old mode, in which the rod is first allowed to run out upon the ground, as before stated, in which case several attendants are required to keep the rod pulled out in various directions by means of draw-hooks until the reeler can take up the surplus rod, which often amounts to seventy-five or a hundred feet, and sometimes more.

Having described my improvements in reeling and delivering mechanism for rod-rolling machines, what I claim therein as new and of my invention, and desire to secure by Letters Patent, is—

1. The combination, with a rolling-mill and rod-coiling reel, of a rod-guiding tube, U, and seizing mechanism S T, substantially as and for the purposes set forth.

2. The combination, with the self-adjusting spindle Q, of the hinged rod guiding and seizing arm S, flange e , spring g , and latch f , substantially as and for the purposes set forth.

3. The combination, with the hinged arm S,

dog *n*, and spring *s*, of the resisting-socket *r'*, substantially as and for the purposes set forth.

4. The combination, with the reel, of the friction-wheels G, M, and L, disk P, and lever O, substantially as and for the purposes set forth.

5. The combination, with the expanding grappling-arms X, properly connected, and

hinged link-pieces Y', of the central rack-bar *x* and extended operating-arm Z, provided with a pinion, *w*, and crank or handle Z', substantially as and for the purposes set forth.

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