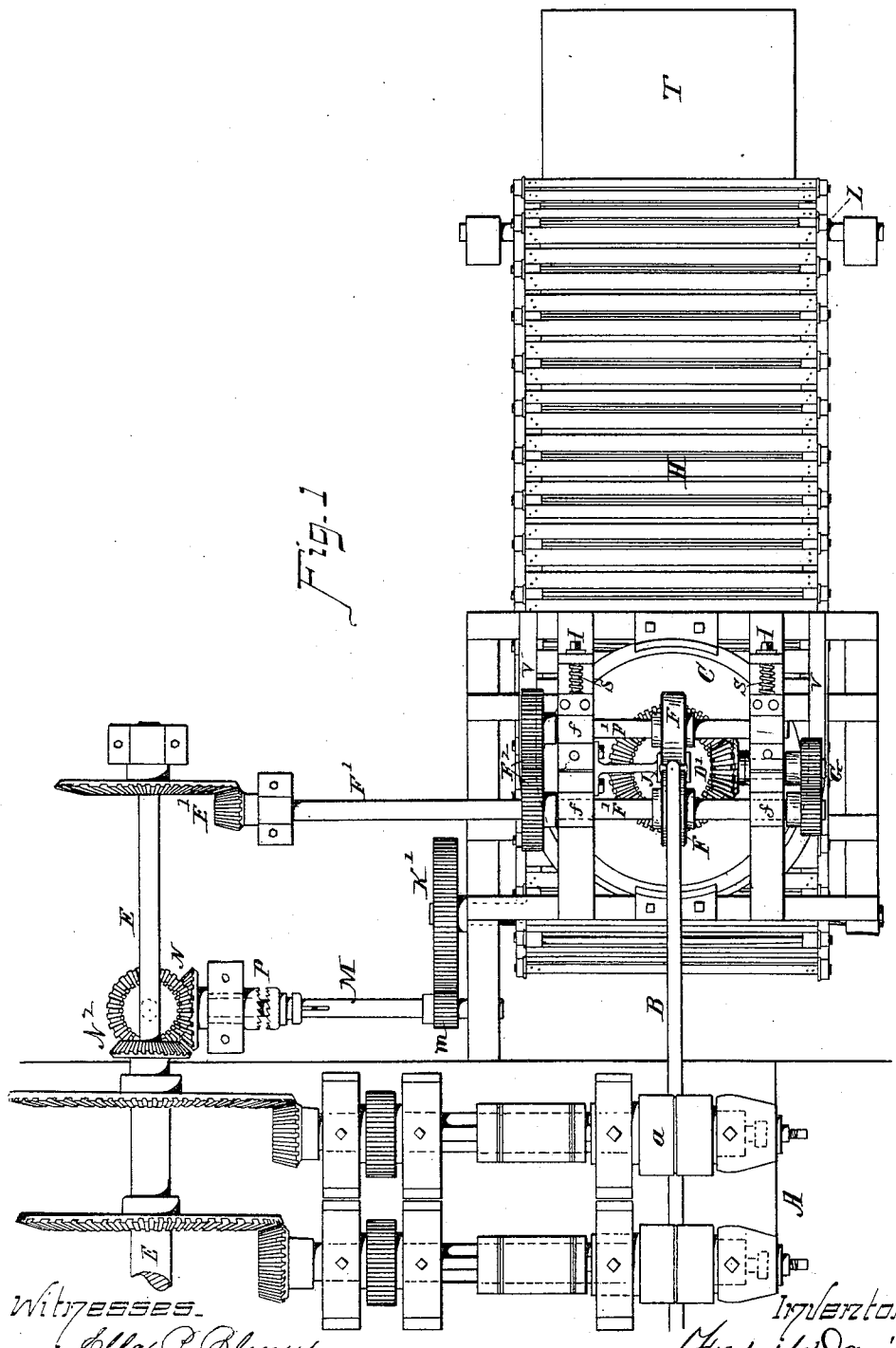
(No Model.) 2 Sheets—Sheet 1

F. H. DANIELS.

APPARATUS FOR AUTOMATICALLY COILING WIRE RODS.

No. 366,383. Patented July 12, 1887.



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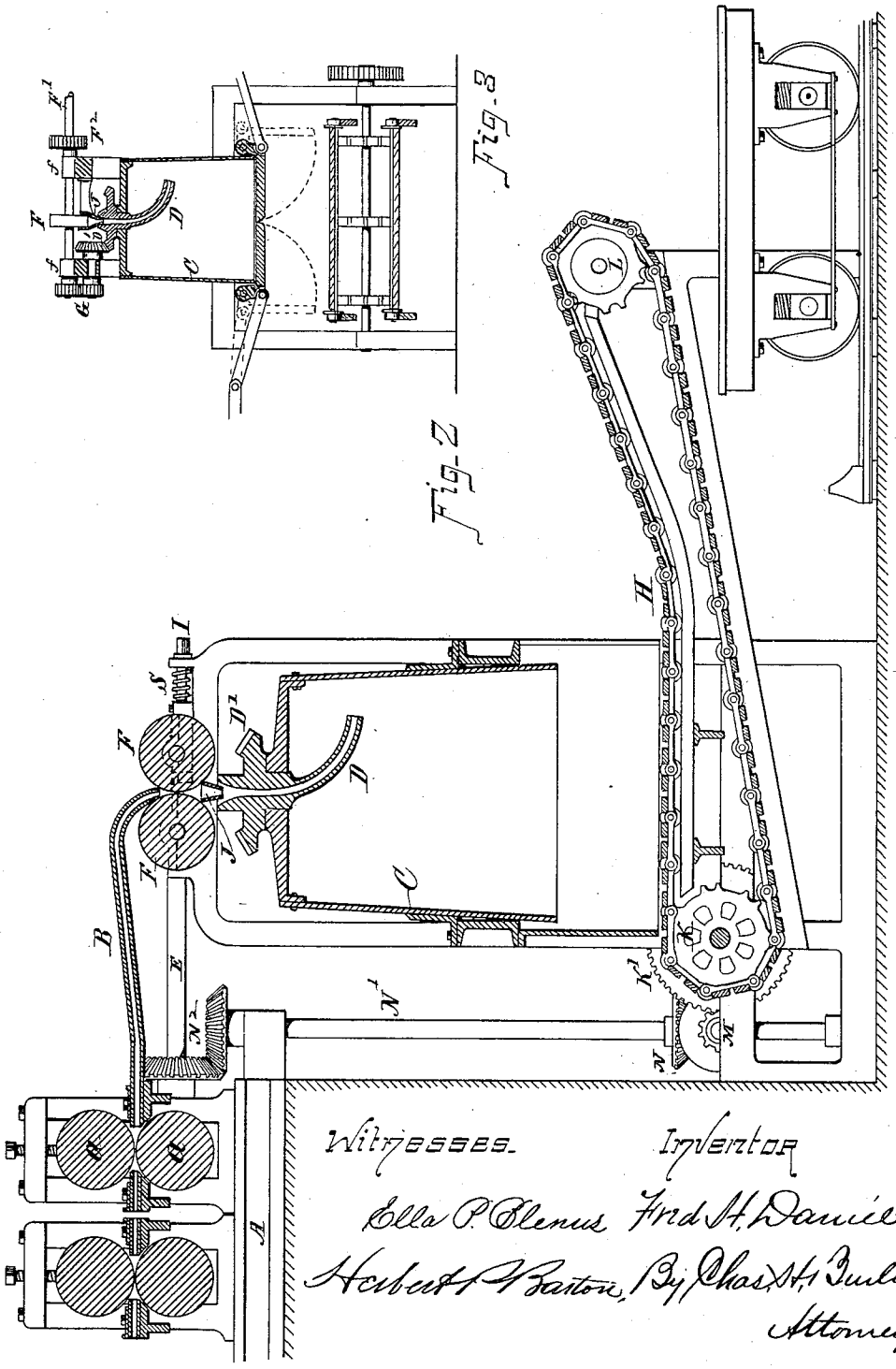
N. PETERS. Photo-Lithographer, Washington, D. C.

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UNITED STATES PATENT OFFICE.

FRED H. DANIELS, OF WORCESTER, MASSACHUSETTS.

APPARATUS FOR AUTOMATICALLY COILING WIRE RODS.

SPECIFICATION forming part of Letters Patent No. 366,383, dated July 12, 1887.

Application filed October 23, 1886. Serial No. 217,018. (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 Automatically 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 objects of my present invention are, first, to provide, in an apparatus for automatically coiling wire rods as they come from a rolling-mill, an efficient means for carrying forward the latter end of the rod after it has left the bite of the finishing-roll and lost the propelling force therein acquired, thereby permitting the use of any desired length of guide-pipe without liability of the retarding or stopping of the rod within said guide; second, to provide, in combination with the rod-coiling mechanism, an endless delivery-bed for conveying the coiled rod away from the coil-forming devices, to be delivered onto a car or other receiver as desired. These objects I attain by mechanism the nature and operation of which is illustrated in the drawings, and explained in the following description.

The particular subject-matter claimed will be hereinafter definitely specified.

In the drawings, Figure 1 is a plan view of such parts of a rolling-mill and coiling apparatus as will illustrate the nature of my invention. Fig. 2 is a longitudinal vertical section of the same; and Fig. 3 is a transverse sectional view, on smaller scale, showing a modification, in which trap-doors are employed at the bottom of the coiling-cylinder.

In referring to parts, A denotes the rolling-mill, which may be a "continuous" mill of ordinary construction, having any desired number of pairs of sets of rolls, or, if preferred, a Belgian train, or a rod-forming mill of any suitable kind for producing wire rods, may be employed.

B denotes the guide-pipe, by which the rod is conducted from the finishing pair of rolls *a* to the coiling-cylinder C, wherein it is discharged by the rotating delivery-nozzle D against the inner surface of said cylinder, to fall in spiral or helical coils from the bottom thereof.

F F indicate draft-rolls located with their bite in the line of the guideway adjacent to the rotating delivery-nozzle D, and adapted for giving a sufficient draft on the rod to carry forward the latter end thereof after it has left the bite of the finishing-rolls *a* of the rolling-mill A, and thus prevent the rod from stopping or becoming retarded in the long guide-pipe B, in which case, instead of forming full rings of coils within the cylinder C, the rod would be simply twisted into a spiral snarl, since the rotating nozzle has no power to move the rod forward after the momentum imparted by the reducing-rolls is exhausted.

The roll-shafts F′ are mounted in suitable bearings, *f*, and are connected by gearing F^2. Said rolls are preferably operated from the driving-shaft E of the rolling-mill, so that their peripheral speed will correspond with the peripheral speed of the finishing-rolls *a*. In the present instance the gearing is arranged as indicated in Fig. 1, wherein the draft-roll shaft F′ is connected with the shaft E by bevel-gears E′, and the rotating delivery-nozzle D is driven from the shaft F′ by the bevel-gears D′ and spur-gears G.

Other arrangement of driving-gearing may be employed, if preferred.

The bearings of one of the rolls F are arranged to slide, and are provided with springs S, so that the bite of the rolls F will have yielding pressure on the rod, and with adjusting-screws I to regulate the action, so that the roll will not press the rod with too great force. A small guide-funnel, J, is arranged between the rolls F and gear D′, for directing the advance end of the rod into the rotating nozzle-tube and acting as a scraper to prevent the end following around the curve of the rolls.

Beneath the coiling-cylinder, and supported on suitable frame-work and guideways, I arrange a traveling endless bed or apron, H, preferably composed of iron lags or transversely-arranged bars linked together in a continuous chain, and provided with rollers along the edges that run upon the guideways. Said traveling bed passes around sprocket-wheels or rolls K and L, one of which is provided

with a driving-gear, K′, whereby motion may be transmitted to said sprockets and traveling bed, as desired. In the present instance the gear K′ meshes with a pinion, *m*, on the shaft M, which in turn is connected by beveled gears N with a shaft, N′, that is operated by beveled gears N^2 from the shaft E. A suitable clutch, P, is arranged on the shaft N for throwing the traveling-bed mechanism into and out of operation when required.

The clutch P may be operated by a forked lever or any convenient well-known devices for moving it into and out of mesh; and said clutch-operating devices may be arranged to be actuated, either automatically or by hand, for imparting to the traveling bed an intermittent action as the successive coils of wire rod are laid thereon.

The length of the traveling bed H may be made as required for conveying the coils of wire to any desired place of deposit—as, for instance, to deposit the coils upon a truck or tram-car, T.

The space below the coil-forming cylinder, and above the surface of the traveling platform or bed, is preferably inclosed by a semi-cylindrical guard, V, to protect the coiled rod, said guard being open in the direction in which the bed travels, so that the coil can pass forward with the bed.

In the operation of my improved apparatus, the wire rod as it comes from the rolling-mill is coiled within the cylinder C and drops down upon the bed H. When the coil is completed, the clutch is thrown into mesh for starting forward the bed, which carries the coiled wire from beneath the cylinder and deposits it upon the truck T, at the same time bringing a clear portion of the table or bed H beneath the cylinder to receive the succeeding coil of rod, the clutch then being thrown out to stop the bed while another coil is being deposited thereon.

In some instances, if desired, the base of the cylinder may be provided with a removable bottom, door, or traps, W, for supporting a coil of wire rod while it is being formed. Said traps may be arranged so as to be operated or swung down, as indicated in Fig. 3, to drop the coil or coils upon the traveling bed H at such time as it is desired to discharge the cylinder. With this arrangement of the apparatus the bed H may have a continuous movement instead of being moved intermittently.

Any convenient means may be employed for working and locking the doors or traps W.

I do not herein make claim, broadly, to a mechanism for coiling rods wherein the coiling is effected by delivering the rod from a rotating guide or nozzle against the inner surface of a stationary cylinder, as such method and means are not features of my present invention otherwise than as elements in combination with other parts.

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

1. The combination, with a rod-coiling mechanism and the guide whereby the rod is conducted from the rolling-mill to said coiling mechanism, of draft-rolls located at the exit end of said guide, for carrying through the end of the rod after it is released from the bite of the reducing-rolls.

2. The combination, with the reducing-rolls *a* and the guide-pipe B, of draft-rolls F, arranged at the exit end of said guide-pipe, substantially as and for the purpose set forth.

3. The combination of the reducing-rolls *a*, the guide-pipe B, and the draft-rolls, one of which is mounted in yielding bearings provided with springs S and adjusting-screws I, substantially as and for the purpose set forth.

4. The combination of the rolling-mill A, the guide-pipe B, the draft-rolls F, the rotating delivery-nozzle D, and coil-forming cylinder C, substantially as set forth.

5. The combination of a rod-coiling cylinder, a rotating delivery-nozzle directing the rod against the inner surface thereof, an endless traveling bed receiving the coils of rod as they fall from the coiling-cylinder, and means for imparting movement to said endless bed for changing its position in relation to the coil-forming cylinder, substantially as set forth.

6. The combination of the rolling-mill A, the guide-pipe B, the draft-rolls, rotating delivery-nozzle D, coil-forming cylinder C, and the traveling bed H, substantially as and for the purposes set forth.

7. The combination, in an apparatus for coiling wire rods, of a coil-forming cylinder, a removable bottom, doors or traps at the base of said cylinder, and a traveling bed or apron disposed beneath said cylinder, upon which the coil is discharged when said doors or traps are opened, substantially as and for the purpose set forth.

8. The combination, substantially as described, with the rolling-mill or rod-forming mechanism and the stationary coil-forming cylinder C, of the draft-rolls F, roll-shaft F′, gears F^2, G, and E′, and mill-driving shaft E, as set forth.

9. The combination of the endless traveling bed H, its operating-roll K and gear K′, the mill-driving shaft E, intermediate shafts and gears, *m* M N N′ N^2, and clutch P, for the purpose set forth.

10. The combination, with the guide-pipe B and the draft-rolls F, of the guide-funnel J, substantially as and for the purpose described.

Witness my hand this 18th day of October, A. D. 1886.

FRED H. DANIELS.

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