

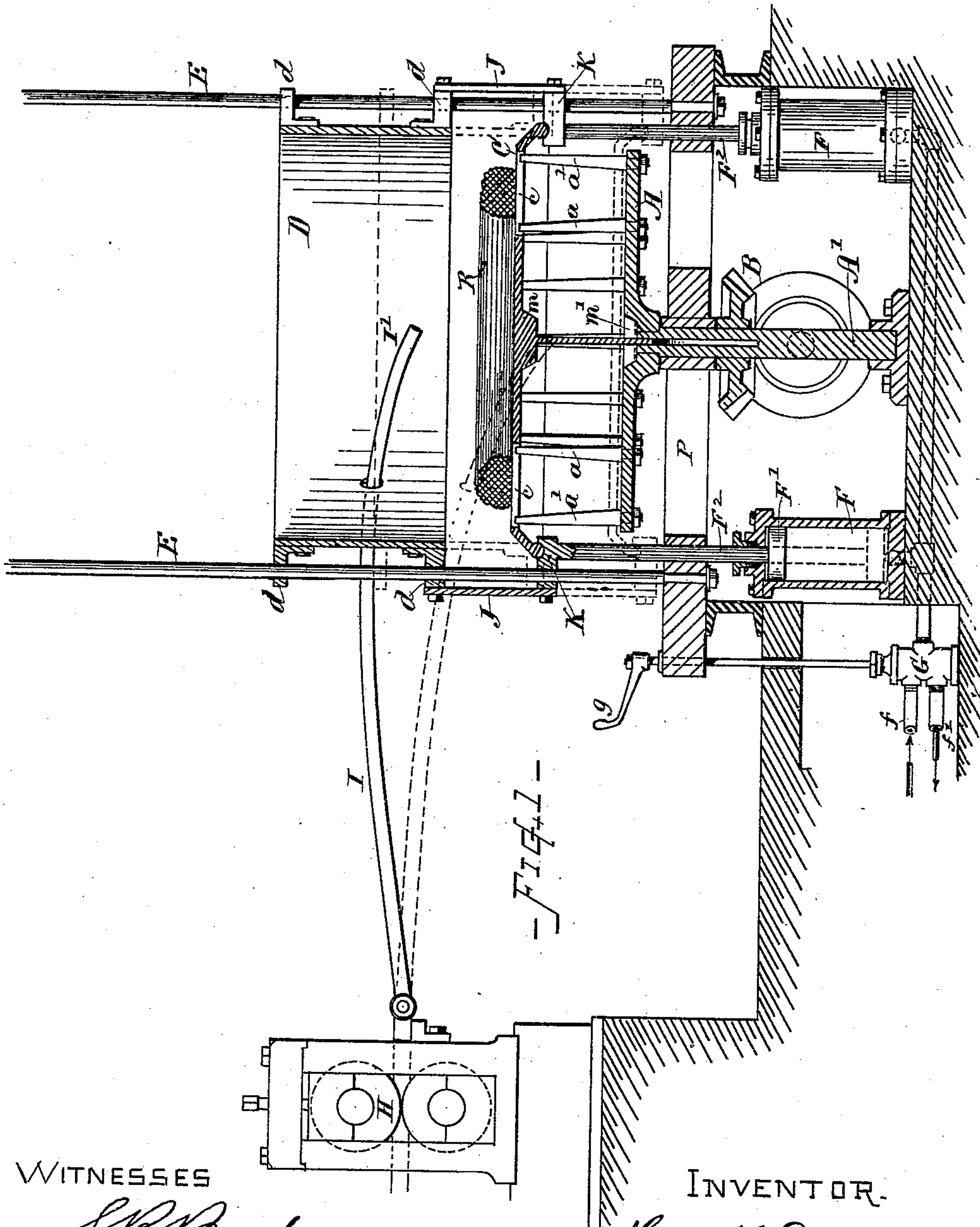
(No Model.)

3 Sheets—Sheet 1.

F. H. DANIELS.
APPARATUS FOR COILING WIRE RODS.

No. 444,550.

Patented Jan. 13, 1891.



WITNESSES

S. P. Barton
Ella P. Blenus

INVENTOR.

Fred H. Daniels
By Chas. H. Burlingame
Attorney

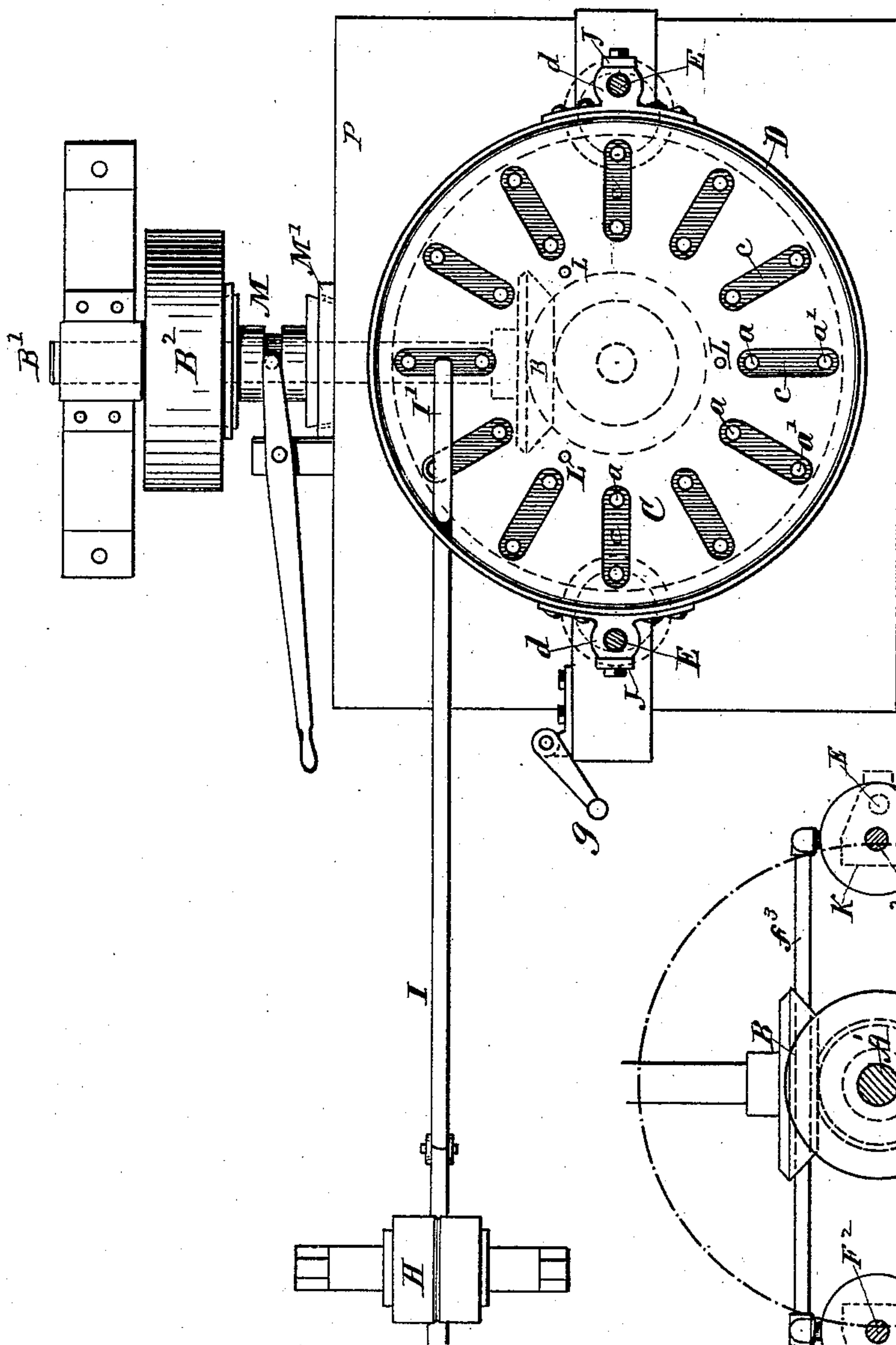
(No Model.)

3 Sheets—Sheet 2.

F. H. DANIELS.
APPARATUS FOR COILING WIRE RODS.

No. 444,550.

Patented Jan. 13, 1891.



— FIG. 2 —

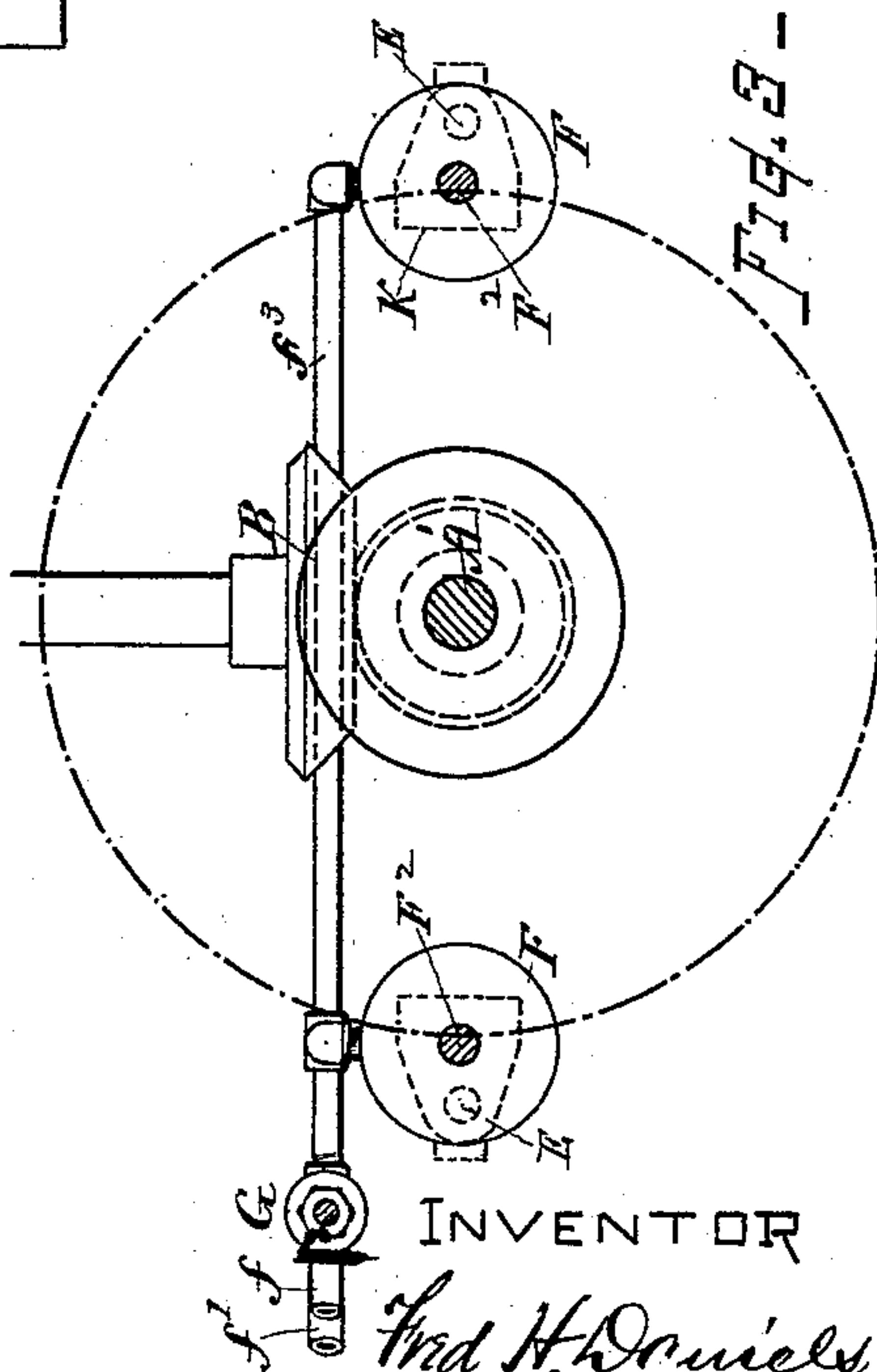


FIG. 3 —

WITNESSES

D. R. Bartore

Ella P. Blenus

INVENTOR

Fred H. Daniels

By Chas. H. Burleigh

Attorney

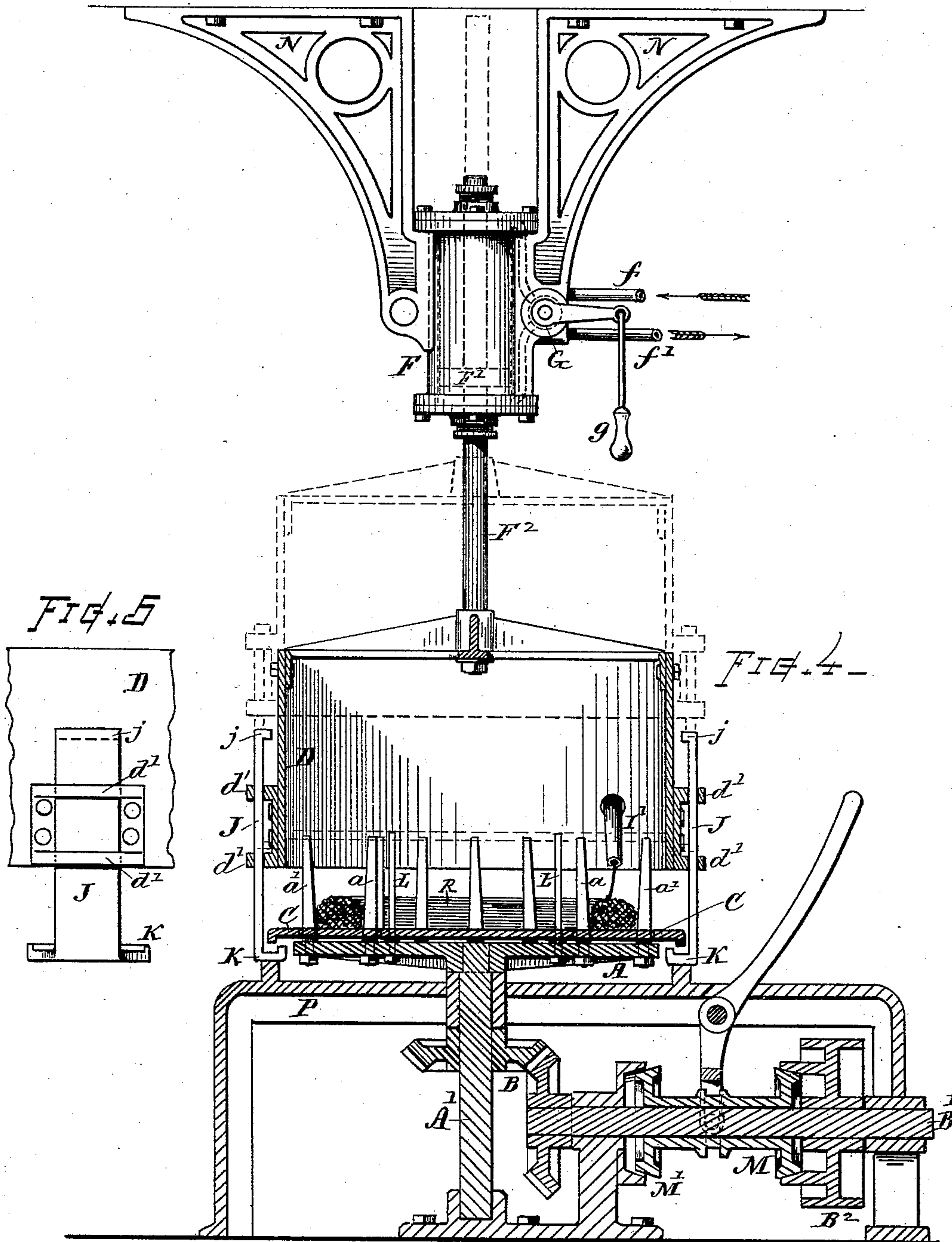
(No Model.)

3 Sheets—Sheet 3.

F. H. DANIELS.
APPARATUS FOR COILING WIRE RODS.

No. 444,550.

Patented Jan. 13, 1891.



WITNESSES
W. H. Barton
Ella P. Blenus

INVENTOR
Fred H. Daniels
By *Chas. H. Burleigh* Atty.

UNITED STATES PATENT OFFICE.

FRED H. DANIELS, OF WORCESTER, MASSACHUSETTS.

APPARATUS FOR COILING WIRE RODS.

SPECIFICATION forming part of Letters Patent No. 444,550, dated January 13, 1891.

Application filed November 19, 1886. Serial No. 219,379. (No model.) Patented in England March 26, 1887, No. 4,550; in France November 29, 1887, No. 187,277; in Sweden November 29, 1887, No. 1,812; in Belgium November 30, 1887, No. 79,740, and in Germany November 30, 1887, No. 44,693.

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 Coiling Wire Rods, (for which Letters Patent have been granted to me in the several countries here named, dated and numbered as follows, viz: in England March 26, 1887, No. 4,550; in France November 29, 1887, No. 187,277; in Belgium November 30, 1887, No. 79,740; in Germany November 30, 1887, No. 44,693; in Sweden November 29, 1887, No. 1,812,) 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 a coiling apparatus adapted for receiving and automatically coiling wire rods from a rolling mill in a rapid, safe, and satisfactory manner, and for conveniently discharging the same from the reel; second, to provide in a rod-coiling apparatus a movable guard and a movable coil-supporting platform, upon which the rod is delivered in coils, both of which are arranged to be operated to facilitate the discharge of the coils from the reel; third, to provide means or hydraulic elevating mechanism connected to actuate both the guard and the platform simultaneously or by the same operating power; fourth, to provide means for together operating the guard and coil-lifting platform, adapted for giving a greater or less extent of movement to the guard than to the platform; fifth, to provide facilities for elevating the coil-receiving platform by mechanism which is independent from the reel-operating shaft, and which engages with the platform at the sides, or at a position eccentric to the axis; sixth, to afford facilities for conducting the rod through the side of the guard, or a guide for delivering it and laying it between the reel-fingers within the guard with facilities for automatically shifting said guide to and

from the reel with the movement of the guard-shield.

In the drawings, Figure 1 is a vertical sectional view of the latter end of a rolling-mill train and a reel or rod-coiling apparatus illustrating the nature of my invention. Fig. 2 is a plan view of the same. Fig. 3 is a sectional plan view at a level below the reel-plate. Fig. 4 is a vertical sectional view of my improved apparatus, modified in that the elevating or guard-operating mechanism is disposed overhead instead of below the reel, and Fig. 5 shows a side view of the extensible connections between the guard and platform.

In the drawings, A denotes the reel, which in the present instance consists of a plate supported on an upright shaft A', which is mounted in suitable bearings and revolved by means of gears B or other driving mechanism. Said plate is provided with two circular rows of upright pins or fingers *aa'*, between which the wire rod is received. Above the reel-plate A is arranged the movable platform, disk, or spider-frame C for receiving the rod as delivered from the rolling mill and for supporting and discharging the coils. Said frame or platform is of somewhat larger diameter than the reel head or plate A, which supports the fingers. Said platform C is provided with openings *c*, through which the fingers *a a'* project, and it is adapted to be raised and depressed, as hereinafter described.

D indicates a guard or shield, preferably of sheet metal, cylindrical in form, with a diameter sufficient to surround the upper part of the reel and of a height sufficient to extend when in its lowest position some distance above the ends of the fingers. This guard is arranged to slide up and down on suitable guide-rods E, to which it is connected by supporting-ears *d*, or in other equivalent manner. The purpose of this shield or guard is to prevent the possibility of loops of rod accidentally getting loose from between the fingers, and being swung round by the rapidly-revolving reel and injuring the attendants. If

preferred, the guard D may be made conoidal instead of cylindrical, or with tapering instead of straight sides.

F indicates the elevating mechanism or cylinders in which are arranged operating-pistons F' , with suitable piston-rods F^2 , connected for raising and lowering the guard D, together with the platform C. In Fig. 1 I have illustrated a pair of the cylinders and pistons arranged below the reel mechanism, while in Fig. 4 I have illustrated the apparatus with a single cylinder F, and piston F' is arranged overhead. The cylinders F and pistons are preferably operated by hydraulic pressure, water being supplied and discharged through the pipes ff' , although steam or pneumatic pressure could be employed if desired, or if in any case found more convenient.

G indicates the valve for controlling the action of the pistons, said valve being operated by a conveniently-disposed handle g .

H indicates the finishing-rolls of the rolling-mill or rod-reducing train, from which rolls the rod is conducted to the reel by a suitable guide-pipe I. The rod is passed into the reel through an opening in the side of the guard D and is deposited upon the platform C between the two rows of fingers $a a'$, where it is coiled by the rotation of the reel, the reel being revolved at a speed substantially corresponding to that at which the rod is delivered from the rolling train.

The end of the guide I' , which delivers the rod within the guard D, is arranged to be raised and depressed automatically with the movement of the guard D to and from the reel, so that the end of said guide I' will be raised above the ends of the fingers $a a'$ at the same time and by the same means as the guard D is elevated.

Connecting-bars J are arranged at the sides of the guard D, which sustain said guard and the platform C in proper relation to each other, and lifters or lugs K are arranged in connection therewith, which lifters engage or take hold beneath the sides of the platform C, when the lifting mechanism is actuated for lifting the guard, and thereby at the same time effect the raising of the platform C to bring it to a position flush with or above the ends of the fingers $a a'$, to facilitate the discharge of the coil. The lifting mechanism is normally independent of and separate from the platform C, so that when the lifters K are in depressed position said platform is free to revolve with the rotary movement of the reel-head.

Guide-pins L are preferably arranged in connection with the discharging-platform C and reel-head A to prevent independent rotation between said parts, thus leaving the spaces c around the fingers free. If desired, some of the fingers a could be made to serve the purpose of the guide-pins; but I prefer to

use a separate pin or pins for this purpose, as they are less subject to derangement, for the reason that the fingers receive the heat and strain occasioned by the rod being coiled against them, which is not the case with the separate guide-pins.

The reel-head plate A and coil receiving and discharging platform C are preferably fitted together with a conical boss or projection m and a correspondingly-shaped cavity m' , which projection and cavity intermesh with each other, when the platform is dropped to its position adjacent to said plate and which serve to center and sustain the platform and reel-plate concentric with each other while revolving.

The side connections J are in Fig. 1 shown as being rigidly attached to the ears d , so that the guard and platform are elevated with substantially the same extent of movement; but, when desired, said connections may be made extensible, so that the guard will have a greater or less extent of movement relative to the movement of the platform, when the elevating mechanism is brought into action. Such a construction I have illustrated in Fig. 4, wherein the connections J are arranged to slide through ears or guides d' , fixed on the side of the guard-cylinder D, which cylinder can consequently move upward without the lifting of the platform until the lugs j at the top of the connecting-bars J strike the ear-pieces d' , when the further movement of the guard effects corresponding movement of the platform. The engaging lugs or lifters K are preferably made with a broad bearing, or of sufficient width to prevent the platform from tilting thereon when elevated. If desired, three lifters may be employed, disposed in triangular relation to the circle of the platform, the connection of each being substantially the same as that illustrated.

In Fig. 1 the guard and discharging-platform are indicated in elevated position in full lines and in depressed position by dotted lines, and in Fig. 5 said parts are shown in depressed position by full lines and their elevated position indicated by dotted lines.

Rotary action is imparted to the reel by means of the gears B and a suitable driving-shaft B' , motion being transmitted to said shaft in any suitable manner, as by a belt on the driving-pulley B^2 . A suitable clutch M is provided for stopping and starting the reel, as required.

The lifters K are preferably employed as a brake for stopping the rotary motion of the reel, the frictional contact of said lifters with the rim or side of the platform being utilized to overcome the momentum of the revolving parts after the driving-clutch is thrown off and while the platform is being raised. If desired, however, to stop the rotary movement before the platform is lifted other suitable brake mechanism may be used, as, for

instance, the counteracting friction-clutch M'. (See Fig. 4.)

In the modification shown in Fig. 4 the elevating mechanism consists of the single hydraulic cylinder suspended overhead by suitable brackets N. In this case the piston-rod is extended through the cylinder and serves as a guide for the movement of the guard D. Consequently the guide-rods E, in connection with the reel-frame P, may be omitted.

In the operation of my improved apparatus the guard D and platform C are lowered to a position indicated in Fig. 4 and by dotted lines in Fig. 1, and the reel is put into rotative operation to receive the rod. The rod is then conducted as it comes from the rolling-mill H through the guide-pipe I, and is directed by the end of the guide I' within the guard, so as to run between the rows of fingers *a a'*, and be thus deposited or laid in coils upon the platform C by the rotation of the reel. When the coil of rod R is complete, the reel is stopped by shifting the clutch M and opening the valve G, thereby letting the hydraulic pressure onto the piston or pistons F', which effects the elevation of the guard, together with the platform C, to the positions indicated in Fig. 1 and by dotted lines in Fig. 4, thus bringing the coil above the tops of the fingers *a a'*, where it can be grappled or hooked off laterally by the attendant, and at the same time bringing the guard D to a position sufficiently high above the level of the platform to permit the convenient removal of the coil through the annular space between the lower end of the guard and the top level of the platform.

In a previous application I have shown and described a reel having a supporter or discharging platform lifted by means of a central shaft passing through the reel-shaft, which latter is hollow. In my present invention the platform is raised by means of lifting devices, which engage therewith at the sides or at positions eccentric to the axis of the reel and platform, thus obviating the necessity of making the reel-shaft hollow.

Another important feature of my present invention is the connection of the guard and discharging-platform so as to be both operated by the same mechanism.

Two or more reel mechanisms operating in the manner described may be employed for taking care of the product of a single rolling-train, suitable switching-guides, arranged in any well-known manner, being introduced into the mechanism for alternately directing the rods to one reel or the other as they come from the rolls.

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

1. The combination of a reel having a movable platform upon which the rod is deposited in coils, a movable guard surrounding the

upper part of the reel, and mechanism, substantially as described, having connections adapted to engage with and move said platform and guard, substantially as and for the purpose set forth.

2. The combination of a reel having a movable platform upon which the rod is deposited in coils, a movable guard surrounding the upper part of the reel, mechanism, substantially as described, for moving said guard, and extensible connections that engage with and raise said platform with the movement of the guard, substantially as set forth.

3. The combination of a reel having a movable platform upon which the rod is deposited in coils, a movable guard surrounding the upper part of the reel and supporting the guide-pipe through which the rod is delivered onto the platform, a cylinder and operating piston for raising said guard and guide-pipe, and connections adapted to engage with and lift said platform simultaneously with the upward movement of the guard, for the purpose set forth.

4. The combination of a reel having a movable platform upon which the rod is deposited in coils, a movable guard surrounding the upper part of said reel, a guide-pipe supported by said guard, through which the rod is conducted onto said platform, an operating piston for raising and depressing said guard, and extensible connections adapted to engage with and operate said platform by and during a portion of the movement of the guard, substantially as set forth.

5. In a rod-coiling apparatus, the combination of a coil-elevating platform, upon which the rod is delivered and coiled, and mechanism for actuating said platform, substantially as described, having lifters that engage the sides of said platform for raising and depressing it.

6. In an apparatus for coiling wire rods, the combination of a reel mounted and revoluble on an upright axis, a platform onto which the rods are deposited in coils, elevating mechanism normally independent and separable from said platform adapted for engaging the sides thereof and raising said platform above the top of the reel, substantially as and for the purpose set forth.

7. The combination, with a reel or rod coiling mechanism having a platform upon which the rod is coiled and movable for elevating the coil above the reel, of a lifter adapted to serve as a brake for overcoming the rotative movement of the mechanism while raising said platform, substantially as set forth.

8. The combination, with a rolling-mill and a rod-coiling reel mounted on a revoluble upright axis, of an adjustable guard and a guide-pipe for delivering the rod to said reel through an opening in said guard, and connected in a manner to be raised and depressed with the movement of the guard.

9. The combination, with a rod-rolling mill
and a revoluble rod-coiling device or reel
mounted on an upright axis and provided
with a non-revoluble guard surrounding the
5 upper portion of said reel and movable in
the direction of the axis thereof, of a guide
extending within the interior of the guard
for directing or laying the rod upon the reel,
and connected to said guard to be carried to

and from the reel automatically with the ro
movement of the guard.

Witness my hand this 13th day of Novem-
ber, A. D. 1886.

FRED H. DANIELS.

Witnesses:

CHAS. H. BURLEIGH,
ELLA P. BLENUS.