

(No Model.)

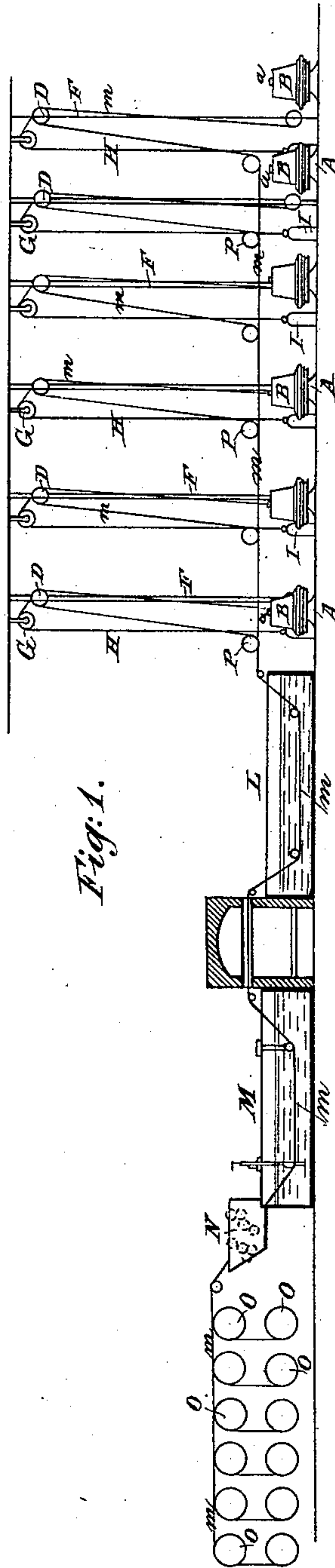
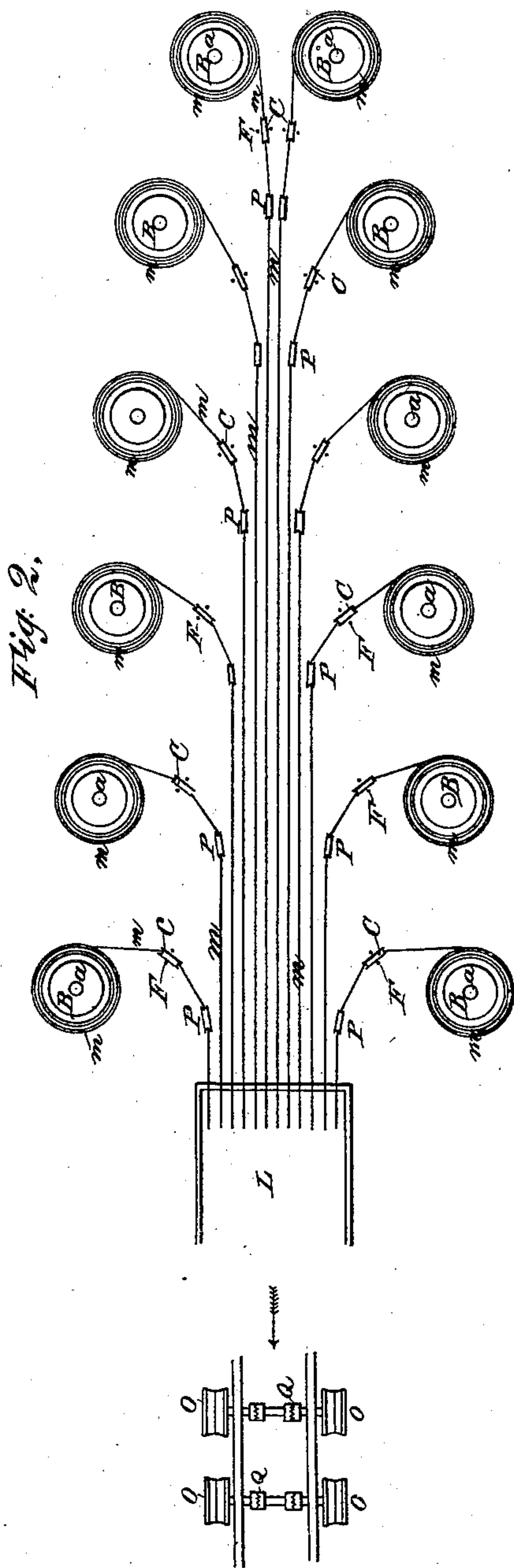
2 Sheets—Sheet 1.

H. ROBERTS.

APPARATUS FOR FEEDING WIRE TO METAL COATING BATHS.

No. 275,521.

Patented Apr. 10, 1883.



Witnesses:
A. H. Pittman
M. F. Boyle

Inventor:
Henry Roberts
By his Atty: J. A. Ostrom

(No Model.)

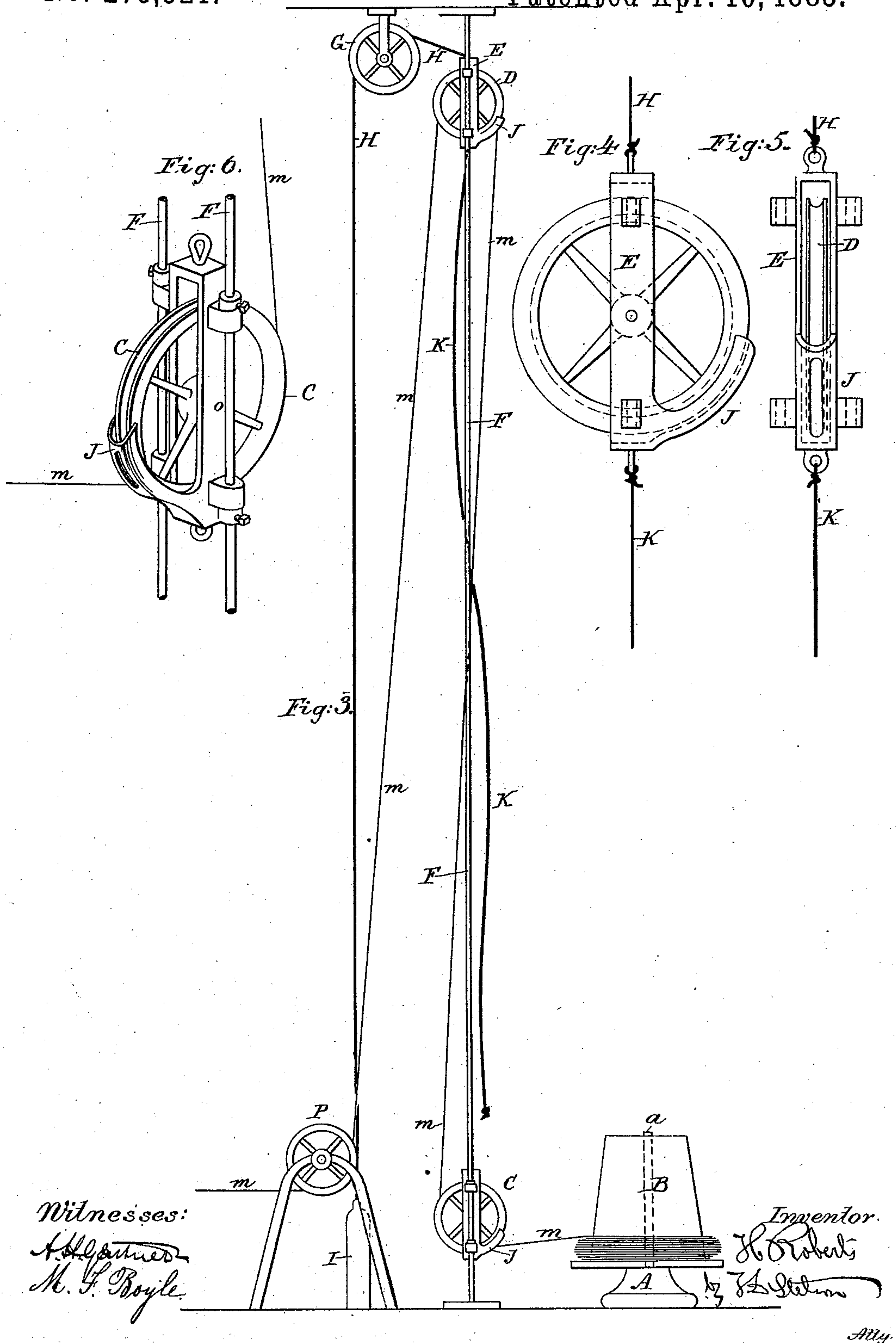
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UNITED STATES PATENT OFFICE.

HENRY ROBERTS, OF PITTSBURG, PENNSYLVANIA.

APPARATUS FOR FEEDING WIRE TO METAL-COATING BATHS.

SPECIFICATION forming part of Letters Patent No. 275,521, dated April 10, 1883.

Application filed November 28, 1882. (No model.)

To all whom it may concern:

Be it known that I, HENRY ROBERTS, of Pittsburg, in the county of Allegheny and State of Pennsylvania, have invented certain new and useful Improvements in Apparatus for Feeding Wire to Metal-Coating Baths, of which the following is a specification.

It is common in metal-coating wire to cause a number of wires to traverse through the bath of melted metal side by side a little distance apart. They are moved uniformly, being drawn through by uniform rotation of the drums or reels on which they are severally wound. They are fed in uniformly by the unrolling of the wires from the several coils, which are supported loosely on reels allowed to revolve freely, as required. In treating large quantities rapidly in this manner, especially some kinds of wire, there is liable to occur entanglements, which involve serious difficulties.

The object of the present invention is to allow time for the attendant to clear the wire from entanglement or obstruction in the delivery before it has broken itself or the machinery, and without interrupting the steady treatment of the same wire, or of any of the others being treated with it. With my apparatus I am enabled to draw the wire through the coating-baths more rapidly than heretofore, and thus to turn out much more work in a given time. I provide for a liberal quantity of slack in each wire between the let-off reel and the bath, and for holding this slack extended by tension induced through a pulley and weight. There is a separate pulley and weight for each wire, all drawing the several quantities of slack upward. The moment there is an obstruction in the delivery of any wire, and by reason of the continued movement of the wire through the bath, the quantity of slack begins to be taken up; the descent of the pulley and ascent of the weight attracts the attention of the watchful operator, who hastens to remove the difficulty. So soon as the entanglement is cleared the delivering-reel revolves rapidly and gives off again the proper quantity of slack to allow the weight to descend, and consequently to allow the pulley to rise to its regular position—thirty feet or more above the bath. I provide for arresting the rise of the pulley gradually as it approaches

its highest point. I equip the rising and sinking pulley and also a pulley under which the wire is guided from the delivery-reel with a slotted tongue, which insures that the wire shall be kept on the pulleys, and aids in straightening any crooks which might otherwise prove injurious.

The accompanying drawings form a part of this specification, and represent what I consider the best means of carrying out the invention.

Figure 1 is a general side elevation of my apparatus, certain portions being represented in section. Fig. 2 is a plan view of the feeding apparatus and take-up reels on a larger scale, parts being broken away. Fig. 3 is a side elevation of one of the feeding devices on a still larger scale. Figs. 4 and 5 represent the traveling pulley, Fig. 4 being a side elevation, and Fig. 5 an edge view of the same. Fig. 6 is a perspective view of the guiding-pulley, which receives the wire from the delivery-reel.

Similar letters of reference indicate like parts in all the figures.

I have applied the invention to the coating of wires with zinc, for which purpose it is eminently adapted, and I will so describe it; but it may be used with advantage in coating wires with tin and with various other metals. The details of the bath and of the preliminary biting with acid and the final wiping and cooling need not be minutely described.

A A, &c., are movable stands having upright pivots *a*, on which are loosely mounted reels B, one reel on each stand. The several coils of wire *m m*, &c., are carried on these reels, which I will term "delivery-reels," and when all is working smoothly these reels deliver their several wires uniformly—one wire to each reel. The apparatus for each wire is similar, and a description of one will suffice for all.

C is a grooved pulley, turning on fixed bearings.

D is a movable pulley, capable of rising and sinking in a path directly over C, being carried in a housing, E, which engages with and is guided by two vertical bars, F, arranged as shown.

G is a pulley supported in fixed bearings at

a sufficient elevation, and H is a rope or chain running over the same and attached by one end to the housing E, and by the other to a weight, I, the gravity of which latter is sufficient to hold up the pulley D against the considerable downward tension on the wire *m*, running over it. There is a slotted guide, J, attached to the housing or support for the lower pulley, C, and arranged to guide the wire reliably upon the pulley and to straighten any crooks as it approaches the same, and another slotted guide similarly marked, attached to the moving housing E and arranged to perform a similar function for the movable pulley D. The usual number of these sets of devices in ordinary practice is twelve for each bath of melted metal; but the number may be varied. They are arranged in sets, as shown, to allow the attendants to obtain ready access to each.

The take-up reels O are provided with clutches Q, or analogous means for rapid disengagement of any one reel when required. The several delivery-reels or let-off reels B are movable, as stated, and can yield by moving bodily or tumbling over when the wire is caught or tangled so that it cannot be delivered properly. In ordinary apparatus for this purpose these means are all that are provided for averting mischief when a wire gets foul. I can use them with the same efficiency as in the usual apparatus. I do make available these provisions in case any extraordinary emergency arises; but in all ordinary cases my pulley D, by yielding downward slowly, allows the wire to continue its motion through the acid and through the bath and through the wiping devices, and to continue to be wound upon the take-up reels at the opposite end of the apparatus, with all the convenience and expedition and with the perfection of the product due to such exact uniformity of treatment, notwithstanding the wires are frequently obstructed for short periods in their delivery from the reels B. Several seconds, usually about half a minute, is available to clean the obstruction before the pulley D will descend quite to the pulley C.

In order the better to attract attention, I paint the several weights I with a bright color, and with the respective number of the reel with which they are serving and expose them in a good light.

In the ordinary operation of the mechanism the pulleys D are at the top of their respective paths and the weights I are resting on the ground. The first foot of change of either is detected by the eye, and the attendant promptly pulls, shakes, or otherwise manipulates to clear the obstruction, seizing the rope K and holding it with sufficient force to retard the rise of the pulley when the obstruction is cleared. The attendant also, by a pressure of his foot or otherwise, checks the violence of the rotations of the reel B when it has been giving off wire rapidly in allowing the pulley D to rise.

In supplying a fresh coil of wire my invention is also eminently useful. The last end of the preceding coil is held firmly by the attendant and the pulley D allowed to slowly descend while the fresh coil is applied on the stand A *a*, and the proper end thereof is rapidly folded, hooked, and twisted to it. Then all is set free. The pulley D rises rapidly, checked near the top by holding more firmly on the rope K, and the reel B is retarded and all is ready to deliver properly with the other.

Fig. 2 shows the arrangement for allowing convenient access. The outermost wires of the series are carried on reels B, held on stands A, quite near the acid-tank L. The central wires of the series are extended along a considerable distance and the wires intermediate in arrangement in traversing through the acid-tank and through the succeeding portions of the apparatus are extended from proportionately farther distances. Each wire runs under its proper grooved pulley, P, sufficiently near the pulley C, corresponding thereto, so that the wire is properly guided as it comes from the elevated pulley D, whether the latter is up in its usual position or temporarily in various lower positions. Half the wires are received from reels B, ranged on one side of the central line, and half from reels similarly ranged on the other side of the center line.

There are usually skillful boy attendants—four boys for each set of twelve wires—two on each side; but this may be varied. The stands A may be shifted about somewhat, but should always be located for regular work at such distance from the center line and from each other as to allow convenient movement of boys and men between, when necessary, in attending to the operation.

M represents the vessel in which is the melted zinc, with its proper adjuncts for maintaining the heat and for holding the wires down therein; also for applying sal-ammoniac, &c.

N is the sand-pile or other wiping means.

I have shown the rollers set forth in my Patent dated May 17, 1881, No. 241,721.

The reel O takes up the wire, and, by thus inducing tension, causes it to move uniformly through the bath, and is provided with a clutch, Q, which allows the take-up to be stopped at will when required. There are as many of the reels O and clutches Q as there are wires to be treated, each capable of being started and stopped independently, when required. My invention allows all to be worked at a higher speed than usual, and with very much less time and trouble lost by stoppages and breakages.

I claim as my invention—

1. In a wire-feeding apparatus having a series of wires traversed simultaneously through the melted metal bath, a corresponding series of independent traveling pulleys, D, carrying each a wire, and means for holding each pulley against the wire, with an independent

yielding force, so as to allow the take-up of the wire to continue for a little time while the reel is stopped, as and for the purposes herein specified.

- 5 2. The series of reels B, fixed pulleys C and P, and movable pulleys D, with suitable actuating means for the latter, one for each wire, acting each independently of the other, in combination with each other and with the metal-
10 tank M, take-up reels O, and separate engaging and disengaging clutches Q, one for each

wire, all arranged for joint operation, substantially as herein specified.

In testimony whereof I have hereunto set my hand, at New York city, N. Y., this 15th day of 15
November, 1882, in the presence of two subscribing witnesses.

HENRY ROBERTS.

Witnesses:

A. E. FIRMIN,
A. H. GENTNER.