(No Model.) 2 Sheets—Sheet 1.

# H. ROBERTS.

## APPARATUS FOR FEEDING WIRE.

No. 268,288. Patented Nov. 28, 1882.

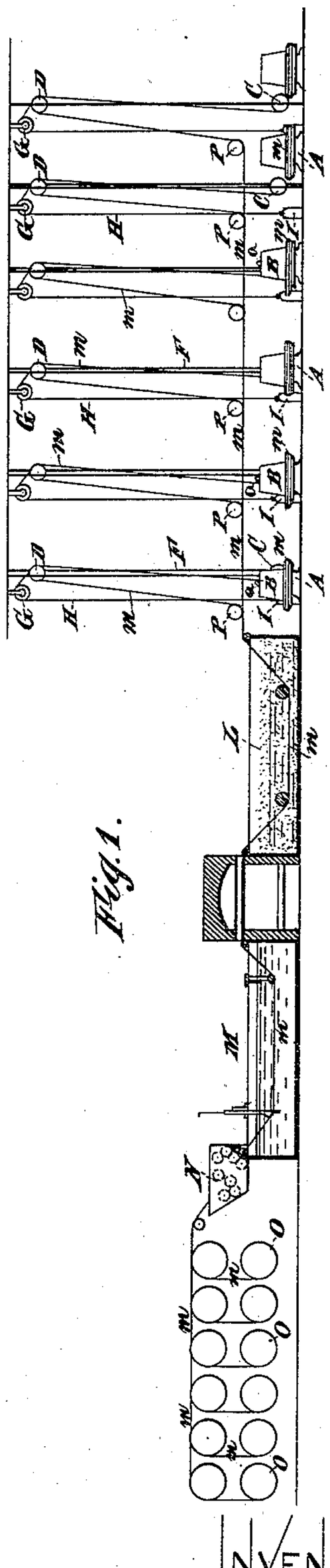

Fig. 1.

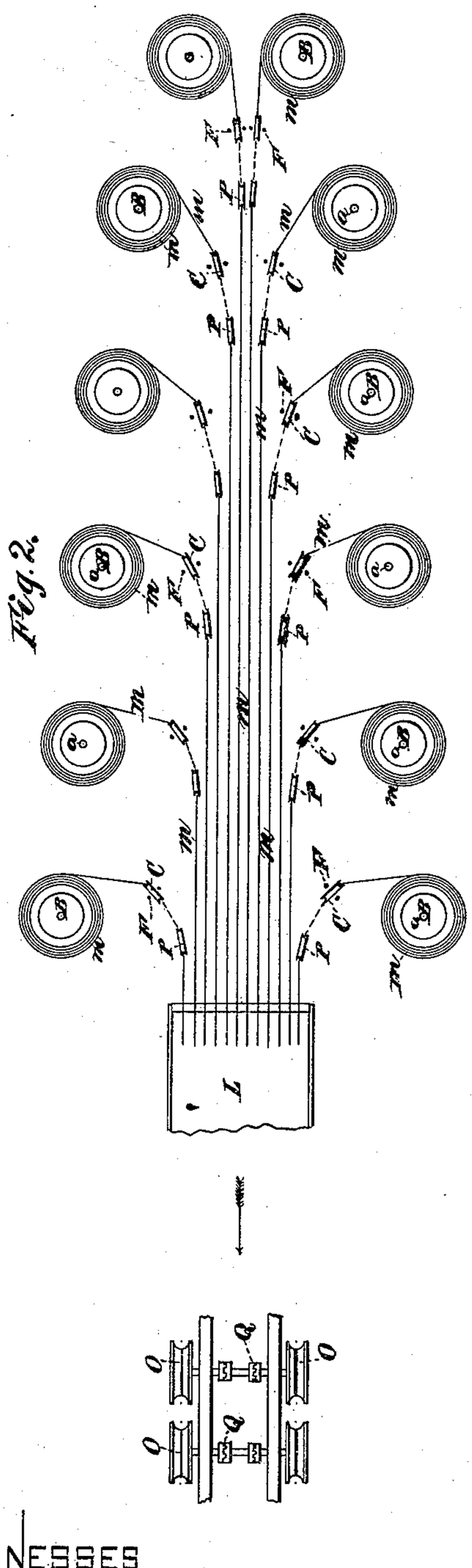

Fig. 2.

WITNESSES

Charles C. Stetson.

Wm C Dey

INVENTOR

Henry Roberts

by his attorney W. Stetson

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# H. ROBERTS.

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Fig. 6.

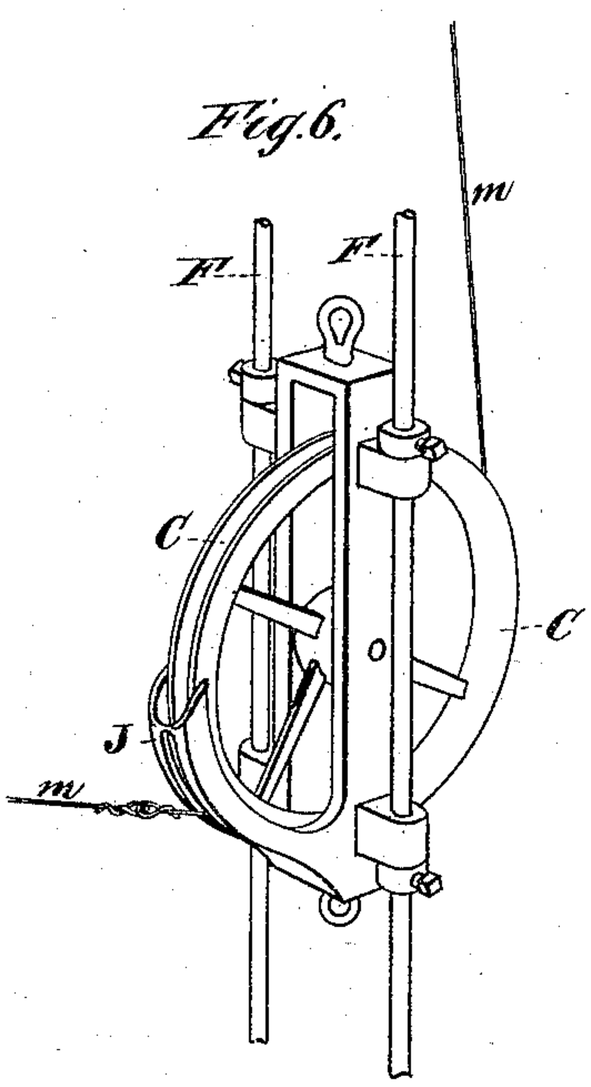



Fig. 3.

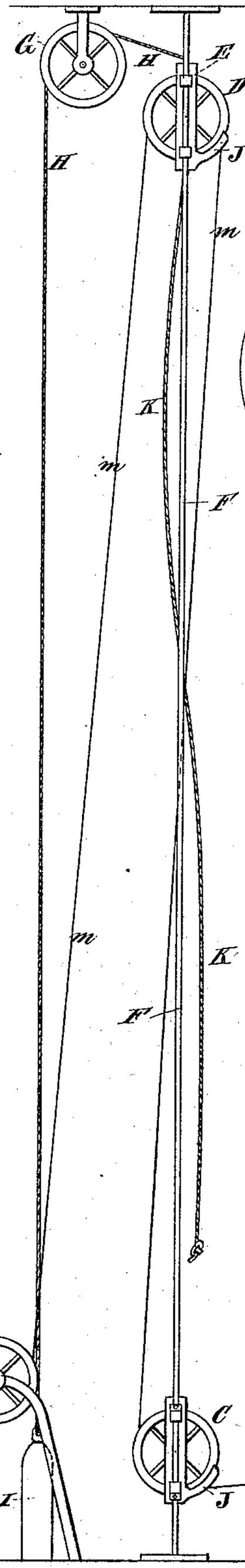



Fig. 4.

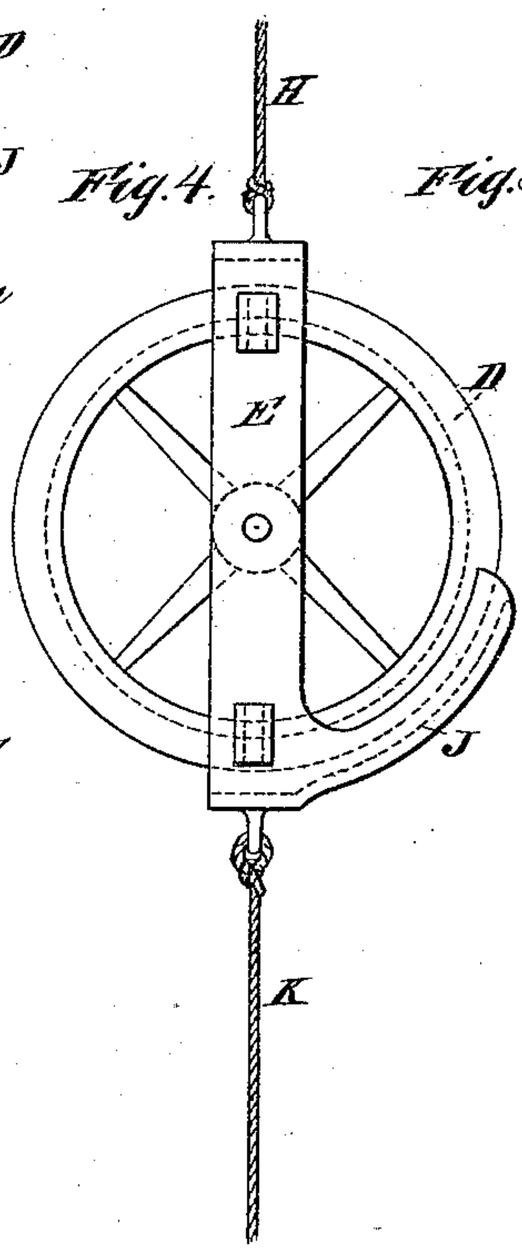
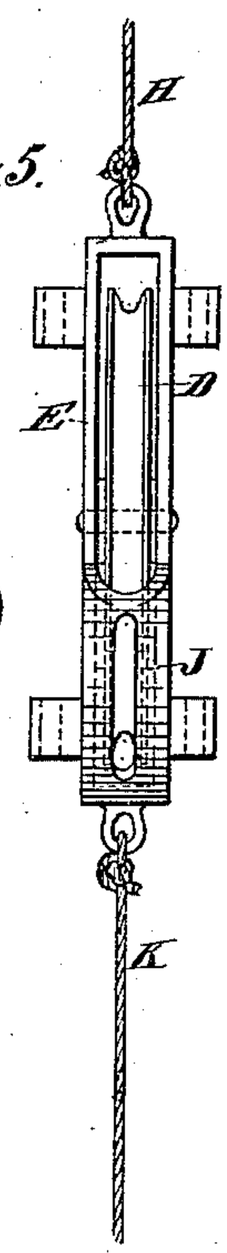



Fig. 5.




WITNESSES.

Charles C. Stetson

Wm. C. Dey

INVENTOR

Henry Roberts

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T. A. Stetson

# UNITED STATES PATENT OFFICE.

HENRY ROBERTS, OF PITTSBURG, PENNSYLVANIA.

## APPARATUS FOR FEEDING WIRE.

SPECIFICATION forming part of Letters Patent No. 268,288, dated November 28, 1882.

Application filed April 25, 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, of which the following is a specification.

It is common in metal-coating wire to cause a number of wires—usually twelve—to traverse the bath 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 are 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 much more rapidly than heretofore, and thus turn out 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 the quantity of slack begins to be taken up, the descent of the pulley and ascent of the weight attract 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 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 let-off 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 and its immediate attachments, 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 important, and I will so describe it; but I believe 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 coiling 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 an axis supported in 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 suf-

ficient to hold up the pulley G 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 having the slot extending up and down, as shown, so as to guide the wire reliably upon the pulley and to straighten any lateral 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 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 seriously obstructed for short periods in their delivery from the reels B. Several seconds—usually about half a minute—are available to clear the obstruction before the pulley 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 properly 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 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 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.

Each 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 an increased speed, and with very much less time and trouble lost by stoppages and breakages as compared with the ordinary mechanism. The wires are led to their several pulleys C at an angle with the planes of the pulleys, so that each tends to run off its pulley on one side. This angle is liable to be considerably varied by accidental changes in the positions of the movable stands A, on which the reels B are allowed to turn, but the angle should always be considerable. The slotted guides J compel the wires to enter the pulleys C properly, and by reason of the slight friction induced against the sides of the slots J compel such a tension on the wire and such a par-

tial bending of the wire as obliterate all previous bends in the wire and cause it to pass the pulley C with a uniform tendency to bend in one direction, which, being subsequently overcome by the treatment, makes each wire practically straight.

My slotted guide J on the lower pulley, C, may be sometimes of use in preventing the rope K from being jammed between the wire *m* and the pulley C, when the descent of the pulley D throws the rope K down in irregular coils.

The combination of the reels B, fixed pulleys C and P, and movable pulleys D, with suitable actuating means for the latter, one for each wire, I propose to make the subject of a separate application for patent, and it is therefore not claimed in this application.

I claim as my invention—

1. In combination with a metal bath, M, and take-up mechanism O, a series of wire-delivering reels, B B, and corresponding guide-pulleys C and movable pulleys D, one set for each wire, each with its slotted guide J, arranged to serve as and for the purpose herein specified.

2. In a wire-feeding apparatus, the delivering-drums B, pulleys C P, guides J, and guide-bars F, in combination with each other and with the traversing pulley D, rope H, pulley G, and weight I, all substantially as herein specified.

3. In a wire-feeding apparatus, the movable pulleys D, and ropes H, with means for inducing tension on the latter, in combination with the pulleys C P, reels B, and metal bath M, and with a check-rope, K, for each movable pulley, as herein specified.

In testimony whereof I have hereunto set my hand, at Pittsburg, this 17th day of April, 1882, in the presence of two subscribing witnesses.

HENRY ROBERTS.

Witnesses:

FRED CRICH,

HERMAN W. VILLIE.