

(No Model.)

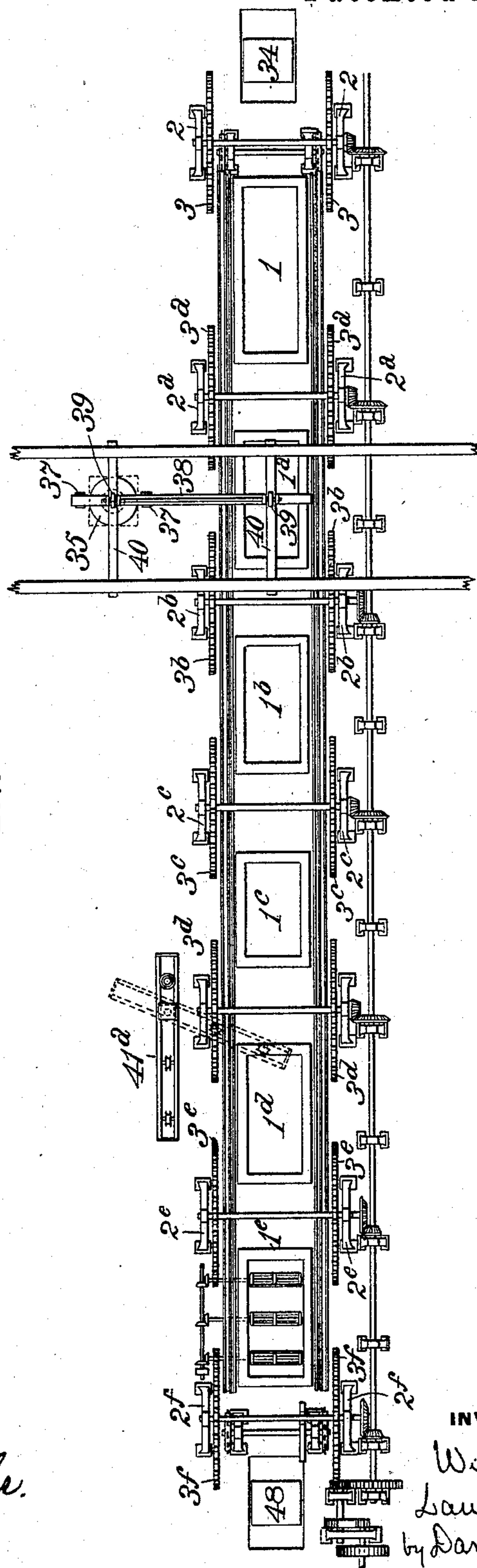
2 Sheets—Sheet 1.

W. L. HAYES & L. W. JERNBERG.
APPARATUS FOR TREATING WIRE, &c.

No. 578,819.

Patented Mar. 16, 1897.

FIG. 1.



(No Model.)

2 Sheets—Sheet 2.

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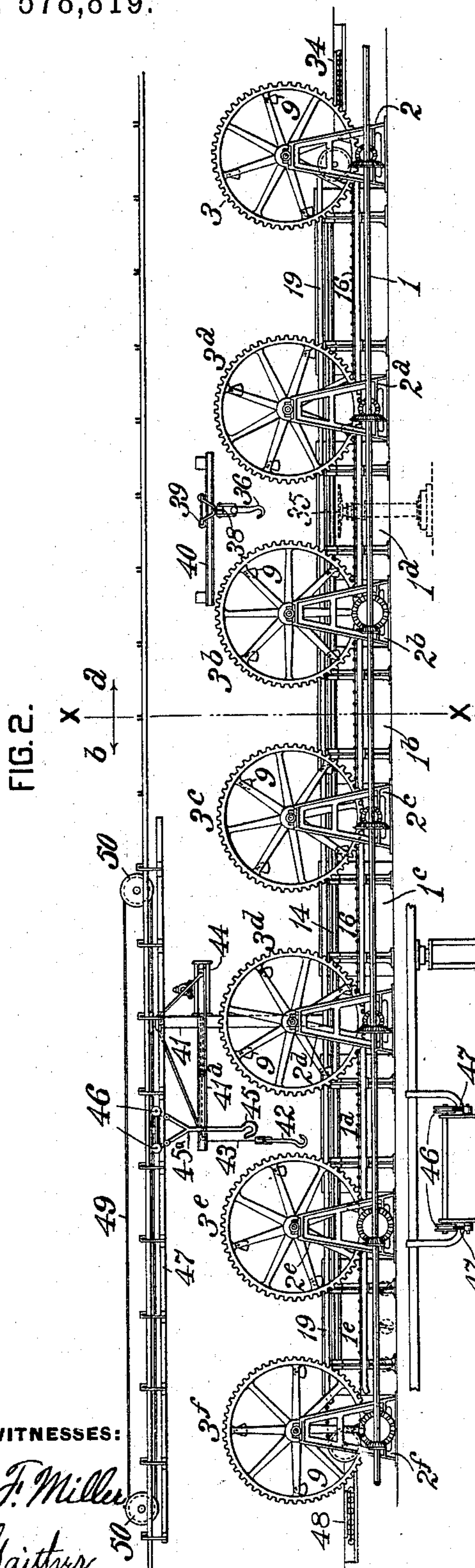
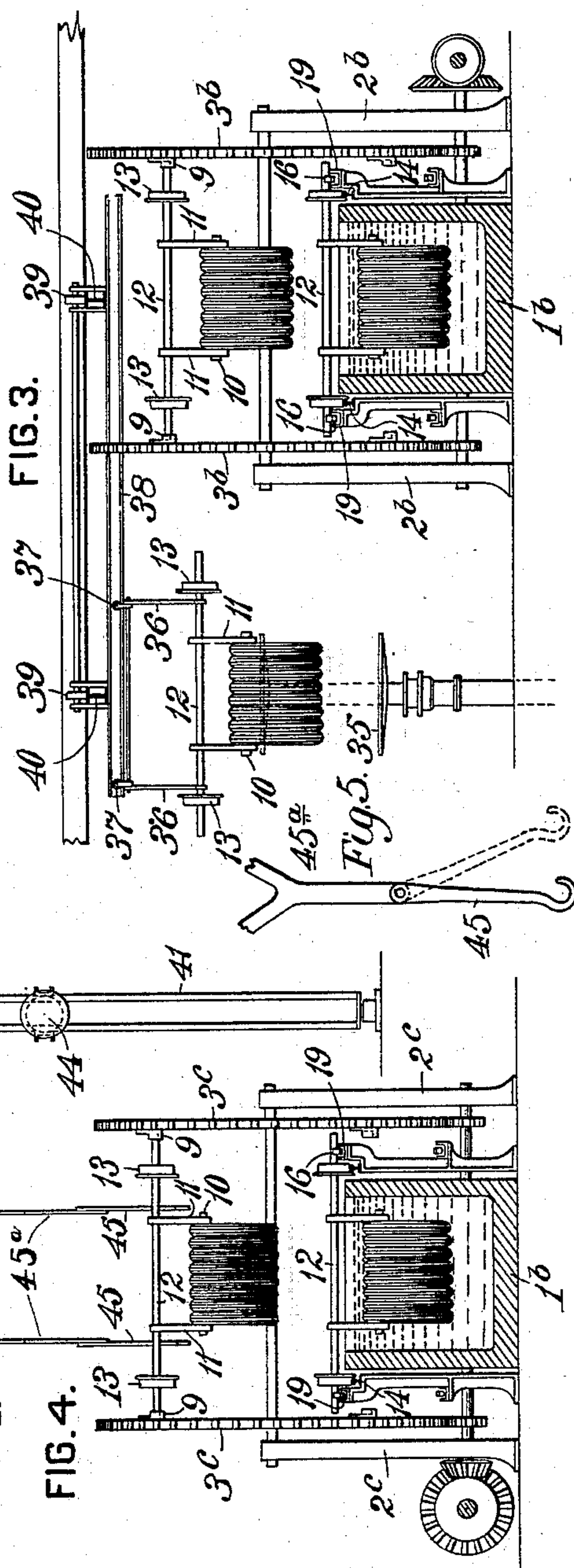


Fig. 2.



3.5.3

FIG. 4:

WITNESSES:

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UNITED STATES PATENT OFFICE.

WILL L. HAYES AND LAURENCE W. JERNBERG, OF CLEVELAND, OHIO;
SAID JERNBERG ASSIGNOR TO SAID HAYES.

APPARATUS FOR TREATING WIRE, &c.

SPECIFICATION forming part of Letters Patent No. 578,819, dated March 16, 1897.

Application filed April 29, 1896. Serial No. 589,541. (No model.)

To all whom it may concern:

Be it known that we, WILL L. HAYES and LAURENCE W. JERNBERG, citizens of the United States, residing at Cleveland, in the county of Cuyahoga and State of Ohio, have invented or discovered certain new and useful Improvements in Apparatus for Treating Wire, &c., of which improvements the following is a specification.

10 In Letters Patent No. 465,700, dated December 22, 1891, an apparatus is described and claimed for the purpose of placing articles, such as bundles of wire, in a treating-bath, moving the articles along such bath, transferring them to an adjoining bath, and so on throughout the entire series of baths. An apparatus for this purpose consists generally of the following baths: strong acid, 15 water, weak acid, water, hot water, and a coating-bath. It is generally preferred to begin the treatment of small-gage wire at the weak-acid bath, and for some purposes the wire should not be passed through the coating-bath. In the apparatus set forth in the 25 Letters Patent referred to provision is made for charging the bundles of wire only at the front end of the apparatus, and when once started the bundle must continue its onward movement through all of the baths.

30 The object of this invention is to provide the charging and removal of bundles of wire at any point or points intermediate of the ends.

35 In the accompanying drawings, forming a part of this specification, Figure 1 is a top plan view of the apparatus. Fig. 2 is a side elevation of the same. Figs. 3 and 4 are transverse sections on the plane of the line $x x$, looking in the direction of the arrows $a b$, respectively. Fig. 5 is a detailed view, on an enlarged scale, of one of the supporting-hooks of the carrying mechanism.

40 As described in the Letters Patent No. 465,700, a series of vats 1 1^a 1^b, &c., are arranged in a row, one behind the other, and standards 2 2^a 2^b, &c., provided with bearings at their upper ends, are arranged at the front and rear ends of the first and last vats and between the intermediate vats. In the

bearings on these standards are mounted the shafts of the lifters 3 3^a 3^b, &c., which may be constructed in either of the forms set forth in the Letters Patent, but are preferably made in the form of gear-wheels provided with pockets 9, pivotally mounted on the inner perimeters of the wheels and so constructed and hung as to always assume a vertical position. The gear-wheels or lifters are preferably driven by pinions on annular shafts, which are in turn driven by a main shaft extending along the line of vats.

The bundles of wire are arranged on a bar 10, which is supported by links 11, depending from the shaft 12 and placed on a table or platform 34, movable in between the pair of wheels forming the lifter at the front end of the apparatus, so that the ends of the shaft 12 will come into the path of movement of the pockets 9. As the pockets are carried around they engage the ends of the shaft and carry it and the bundles up and backwardly and place the support-wheels 13 of the shaft on the rails 14, arranged on top of or alongside of the vats whose ends project within the peripheries of the wheels forming the lifters at each end of the vats. The bundles are carried along the vats by endless chains 16, arranged in guide troughs or channels 19, and provided with upwardly-projecting dogs, which bear against the shafts 12, causing them to move along their rails and drag the bundles through the vats. The shaft 12 with its depending bundles is moved along the vats to the ends of the vats, from which it is lifted by the pockets of the lifter at the end of the vat.

An apparatus such as described generally consists of six vats containing, respectively, strong acid, water, weak acid, water, hot water, and a coating mixture, but heretofore no provision is made whereby wire may be introduced into or removed from the apparatus at intermediate points.

In order to effect the intermediate introduction of the bundles of wire, they are connected to a shaft 12, as hereinbefore described, and placed upon a table or platform 35, which is arranged at any desired point alongside

the apparatus and is preferably raised by a fluid-pressure cylinder and piston sufficiently far to permit the hooks 36 to engage the shaft 12. These hooks are suspended from wheels 5 37, mounted on a rail 38, extending from the platform 35 over the line of vats, as shown in Fig. 3. This rail is suspended from trolleys 39, mounted on rails 40, arranged parallel with the line of vats. As soon as the hooks 10 engage the shaft 12 the platform is lowered and the hooks carrying the shaft and bundles are moved along the rail 38 until in line with the vats. The rail 38 is then shifted laterally on its support until the ends of the shaft 15 12 is in the path of movement of the pockets 9 on one pair of lifters. As these pockets come around the shaft is lifted from the hooks and carried along by the pockets and placed on the rails of the next vat, the bundles entering said vat. In the construction shown 20 this intermediate charging mechanism is arranged to place a shaft 12 with its bundle of wires on the lifting mechanism immediately in front of the weak-acid bath, but may be located at any other desired point.

By reversing the hooks the mechanism might be employed for removing a shaft with its bundles from the lifters, the hooks being shifted into the line of downward movement 30 of the pockets, but it is preferred to employ the construction shown in Fig. 4 for that purpose, as in such construction provision is made for carrying the bundles along to the end of the treating apparatus or to another 35 portion of the plant. This removing mechanism, which in the present case is located in suitable relation to the pair of lifters employed for transferring the bundles of wire to the hot-water bath, consists of an axially-rotatable mast 41, having a horizontal projecting arm 41^a, from which hooks 42 are suspended in such manner as to permit of their 40 being raised and lowered. In the construction shown the hooks are suspended by a wire rope 43, passing over a guide-pulley on the arm 41^a and connected to the piston-rod of a fluid-pressure cylinder 44. When it is desired to remove a bundle of wires for the purpose of coating the wire with metal or for other 45 purposes, the crane is swung around until the hooks 42 will lie in the path of the bundle-carrying shafts on the lifter 3^d, so that as the shafts are moving down the hooks 42 will engage therewith, and as the lifter continues 50 its movement the pockets will drop away from the shaft, whereupon the crane can be swung around and the bundles deposited on a truck or the floor of the mill.

When it is desired to transfer the bundles 60 of wire to the receiving-table 48 without passing them through the vats 1^d and 1^e, a trolley 46, mounted on rails arranged above and in line with the treating apparatus, is moved along its rails until the hooks 45 can 65 be brought into engagement with a bundle-

carrying shaft, which will be left suspended on the hooks 45 as the lifter 3^d continues its movement. The trolley is shifted along its supporting-rails by an endless band 49, passing over pulleys, one of which is positively 70 driven in any suitable manner. In order to prevent the hooks 45 from engaging any of the bundle-carrying shafts on the lifters 3^e and 3^f as it is moved back to position over the lifter 3^d, the hooks are reversed, as shown 75 in Fig. 2, and are pivotally connected to arms 45^a, depending from the trolley 46, so as to pass freely over any shafts on the lifters 3^e and 3^f. If desired, the rails may be extended to any portion of the mill. 80

It will be readily understood that this mechanism can be employed for charging bundles into the apparatus, the hooks 42 on the crane being employed to transfer the shaft and its bundles from the hooks 45 to the 85 pockets on one of the lifters. By the use of these charging and removing mechanisms bundles of wire can be placed in and removed from the apparatus without in any way interfering with its normal operation. 90

We claim herein as our invention—

1. In an apparatus for treating wire, &c., the combination of a series of two or more vats, mechanism for receiving a bundle of wire at a point outside of the first vat and de- 95 positing it in the same, mechanism for shifting a bundle along the vats, mechanism for transferring the bundle from one vat to the next succeeding vat, mechanism for lifting a bundle from the last vat of the series and de- 100 positing it at a point outside of the vat, and mechanism for placing a bundle of wire in the apparatus at an intermediate point, substantially as set forth.

2. In an apparatus for treating wire, &c., 105 the combination of a series of two or more vats, mechanism for receiving a bundle of wire at a point outside of the first vat and depositing it in the same, mechanism for transferring the bundle from one vat to the next 110 succeeding vat, mechanisms for shifting the bundle along the vats, mechanism for lifting a bundle from the last vat of the series and depositing it at a point outside of the vat, and mechanism for removing a bundle from 115 the apparatus at an intermediate point, substantially as set forth.

3. In an apparatus for treating wire, &c., the combination of a series of two or more vats, mechanism for transferring a bundle of 120 wire from one vat to the next succeeding vat, a vertically-movable platform arranged at one side of the transferring mechanism and a carrying device movable in two directions, at right angles, and parallel to the direction of 125 movement of the transfer mechanism, substantially as set forth.

4. In an apparatus for treating wire, &c., the combination of a series of two or more vats, mechanism for transferring a bundle of 130

wire from one vat to the next succeeding vat,
an elevated carrying mechanism provided
with hooks, said carrying mechanism being
so arranged that its hooks may be shifted
5 into engagement with a bundle of wire while
supported by the transfer mechanism, sub-
stantially as set forth.

In testimony whereof we have hereunto set
our hands.

WILL L. HAYES,
LAURENCE W. JERNBERG.

Witnesses:

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W. C. MARTIN.