Sept. 20, 1927. 1,643,186

H. A. STAPLES ET AL

MACHINE FOR PICKLING COILS OF WIRE OR RODS

Filed July 22, 1925 3 Sheets-Sheet 1

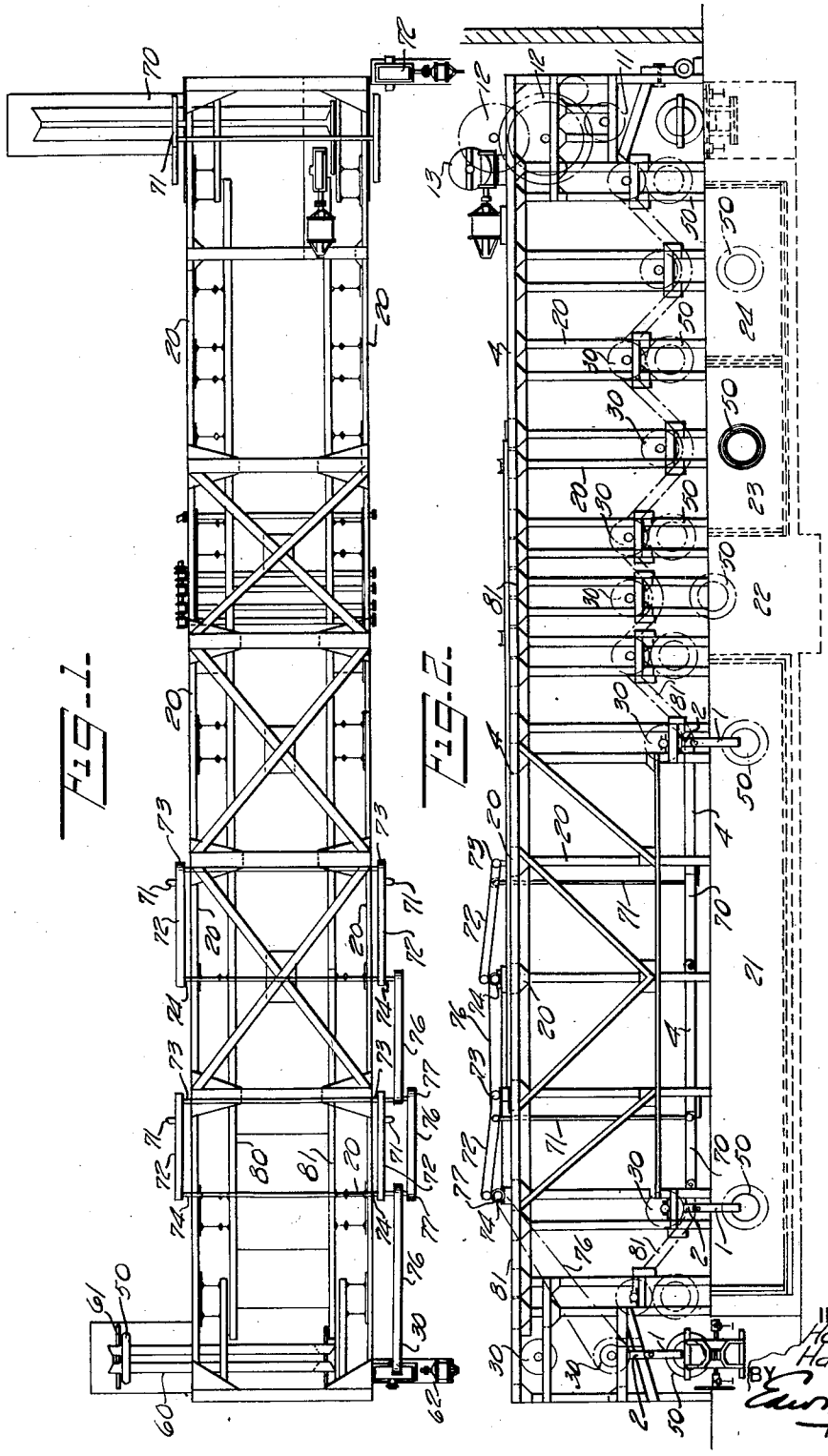


FIG. 1.

FIG. 2.

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FIG. 3.

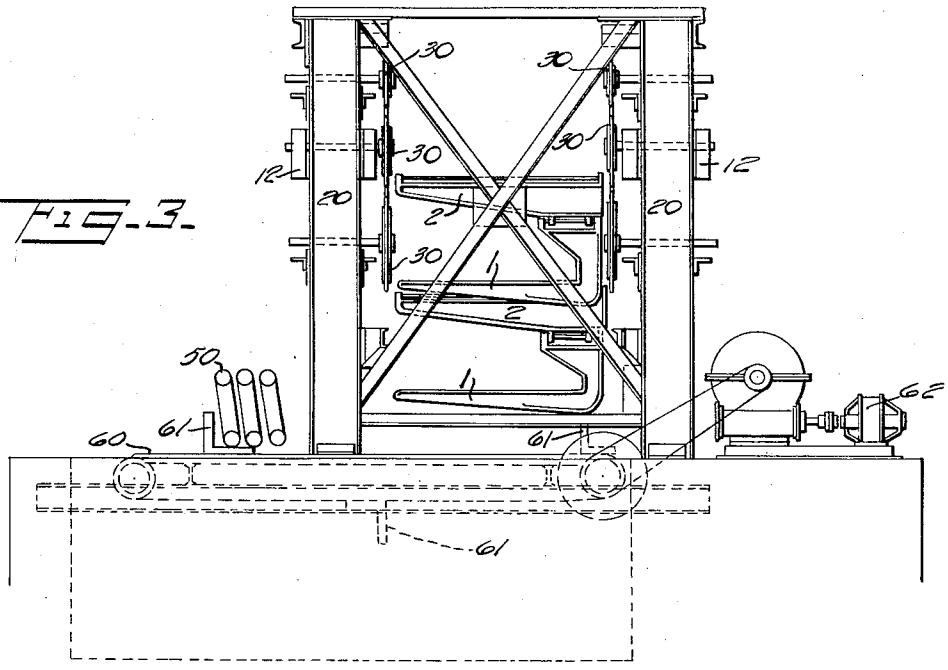
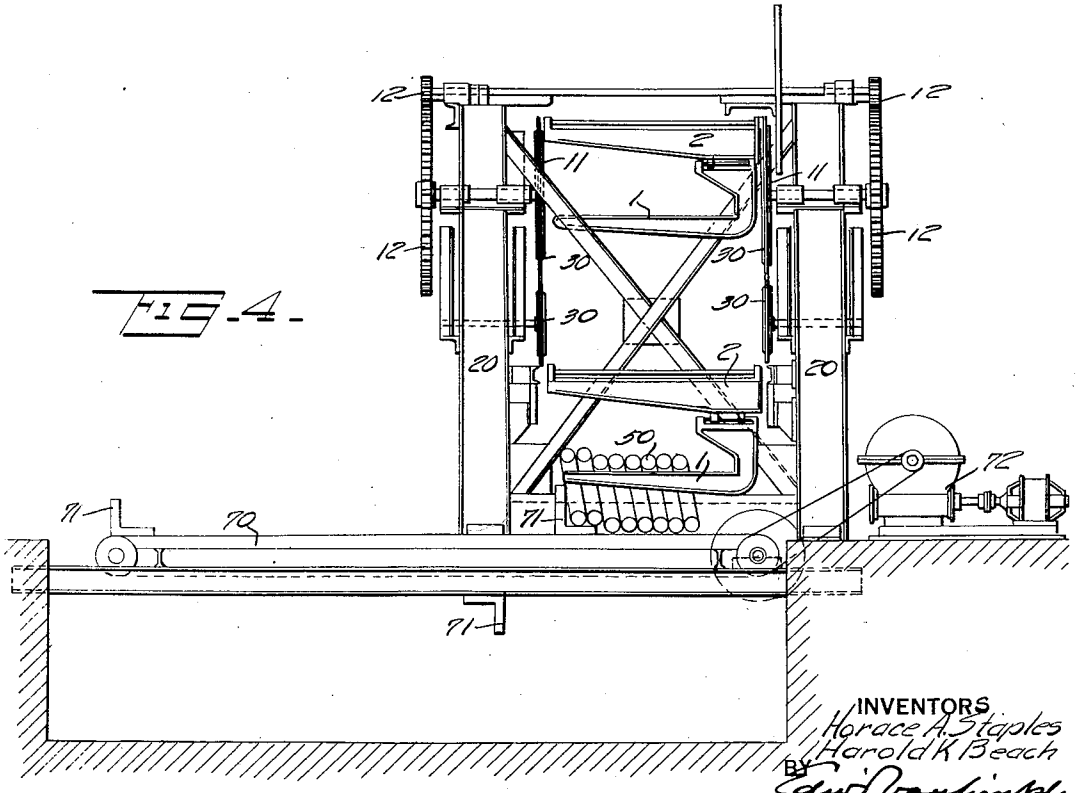


FIG. 4.



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FIG. 5.

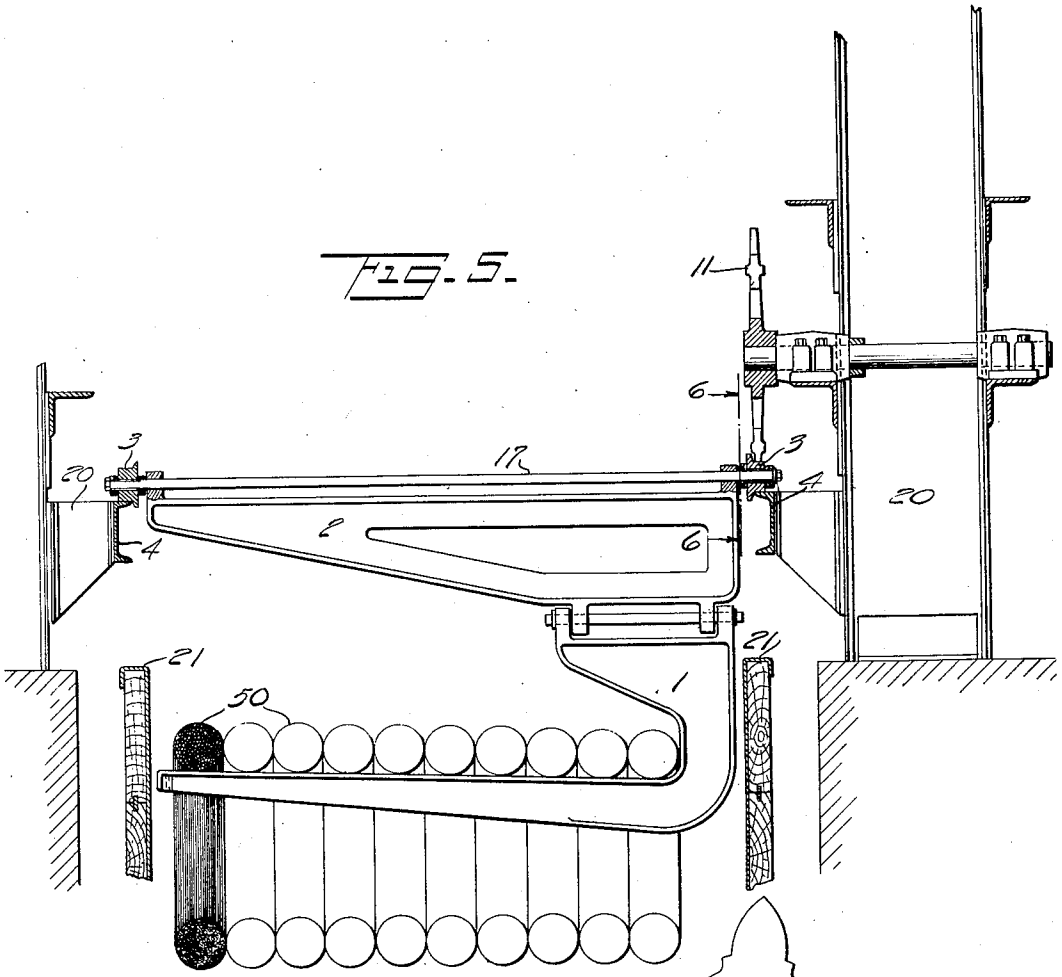
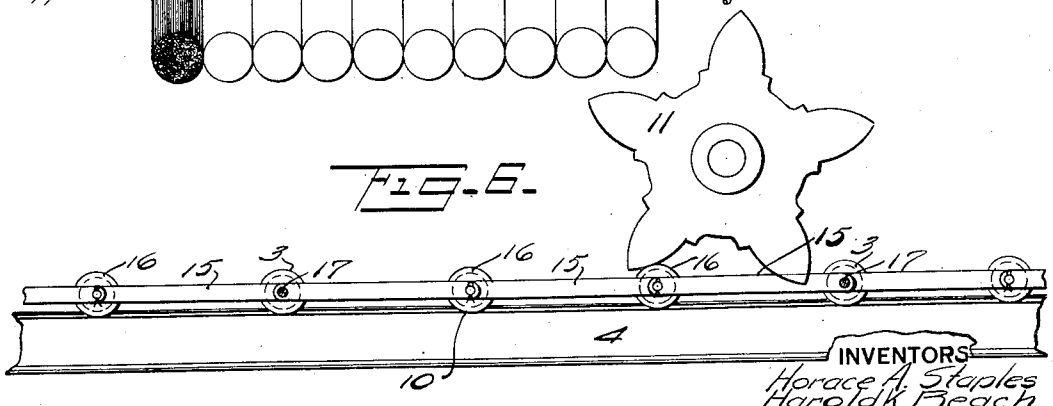


FIG. 6.



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UNITED STATES PATENT OFFICE.

HORACE A. STAPLES, OF PLAINFIELD, AND HAROLD K. BEACH, OF ROSELLE, NEW JERSEY, ASSIGNORS TO AMERICAN COPPER PRODUCTS CORPORATION, OF NEW YORK, N. Y., A CORPORATION OF DELAWARE.

MACHINE FOR PICKLING COILS OF WIRE OR RODS.

Application filed July 22, 1925. Serial No. 45,289.

Our invention relates to machines used for pickling of wire or rods in which the coils are conveyed through successive acid and water baths and has for its object the production of a simple machine that will be efficient in its work and reduce the labor of handling incident to the process.

The machine consists of a plurality of swinging horizontal bars mounted transversely with one unobstructed end and suspended from the other end to the conveyor. Batches of coils are loaded on these horizontal bars hanging downwardly and pass through the acid and water baths. During the progress through the baths the mechanism may be given a vertical vibratory motion at various points in the passage of the coils through the acid bath, thereby shaking out air and scale from the coils, thus facilitating the pickling and assuring a more uniform product.

The foregoing and other features of our invention will now be described in connection with the accompanying drawings forming part of this specification in which we have represented our mechanism in its preferred form after which we shall point out in the claims those features which we believe to be new and of our joint invention.

Referring to the drawings,

Figure 1 is a plan view of our machine.

Figure 2 is a side elevation thereof.

Figure 3 is an end view of the machine looking from the left or the loading end.

Figure 4 is a view of the delivery end, looking from the left.

Figure 5 is an enlarged view of the supporting member and the associated conveyor apparatus.

Figure 6 is a section 6—6, Figure 5, showing a fragmentary view of the conveyor chain.

In the carrying out of our invention we provide a plurality of horizontal supporting members 1 pivotally suspended from one end to a member 2 mounted on a shaft 17 provided with rollers 3 adapted to ride on a rail or a track 4. The rollers 3 are connected to any suitable conveyor chain 10 and driven by sprockets 11 through a chain of gears 12 by a driving mechanism 13. The conveyor is suitably supported by a structural frame 20, and passes over a plurality of vats 21, 22, 23, 24 and so guided by rails 4 and direction idlers 30 that the coils of wire 50 are passed through the solutions that may be placed in the vats. These vats may contain successive baths of dilute acid, water or drawing soap as may be desirable in the carrying out of any process of pickling.

At the loading end of the conveyor the coils of wire may be delivered from the coiling machine over the end of an apron conveyor, not shown, so that the coil drops in a vertical position ready to be tied together. The coil is then rolled over on to the delivery conveyor 60 shown in Figure 3 which operates at right angles to the main conveyor carrying the horizontal bars with the unobstructed ends where it rests against an adjustable upright 61.

After a predetermined number of coils are thus assembled in vertical position on the delivery conveyor, the conveyor is set in motion, it being driven by the motor 62, the plurality of coils are moved along into the machine proper where one of the horizontal supporting members 1 is ready to receive the group of coils, it being in line with the axis of the delivery conveyor and adapted to enter through the center of the coils. It will be readily understood that in place of this conveyor we may use a car or other means for advancing a plurality of coils thus assembled to their position on the main conveyor, the only requisite to this invention being that the coils thus assembled must be arranged at right angles to the conveyor with their centers in line with the horizontal bars with the unobstructed end. As soon as the coils are in place on the supporting member 1 the conveyor 10 starts to move, lifting the coils of wire off the delivery conveyor or car and carries the coils on their path through the successive baths.

This action of loading is repeated, and may be continuous or intermittent depending on whether it is desirable to load and unload from the same end or opposite ends of the machine. If the plant is designed so that it is preferable to load and unload from the same end of the machine, the coils

pass through the baths and are returned back overhead to the point of beginning where the loading conveyor or car must be run in the reverse direction to unload as will be readily understood.

In the preferred modification shown we have illustrated a similar conveyor at the unloading or delivery end. This is a conveyor similar to the loading conveyor comprising an endless conveyor 70 provided with adjustable rests 71 against which the coils may stand when being unloaded. Any simple conveyor may serve for the purpose, the one illustrated being driven by the mechanism 72 or we may elect to use a car or wagon for the purpose.

The main conveyor carrying the horizontal supporting members 1 comprises two conveyor chains 10 which in the form shown consists of links 15 pivoted together and provided at these joints with rollers 16. These rollers ride on tracks or rails 4 and the path changed by means of direction idlers 30. The path of the supporting members 1 is easily followed in and out of the various tanks or vats by referring to Figure 2. Spaced conveniently are connecting bars 17 which are provided with rollers 3 similar to 16. On these bars are pivotally supported members 2 from which the supporting bars 1 are hinged, these bars 1 being suspended from one side only and therefore have one unobstructed end ready at all times to receive the coils of wire, as will be readily understood by referring to detail, Figure 5.

In order to make the pickling more rapid and uniform it may be necessary to vertically vibrate the coils while they are passing through the acid in vat 21. In order to accomplish this we provide sections of the rail or track 70 pivoted at one end to the rail or track 4 the opposite end being connected by supporting rod 71 to a frame 72 which is pivoted to the structural frame 20 at 73 the free end of the frame 72 adapted to ride on a cam 74 which causes the oscillating motion desired, as will be readily understood by referring to Figures 1 and 2. These cams are rotated by any source of power, or may be connected by belts 76 to pulleys 77 driven by one of the idlers 30.

In the usual carrying out of our pickling process, acid bath is in tank 21, washing water 22, clean water 23, and drawing soap in 24 but we may use any other combinations known to those skilled in the art. Although we intend to wash the coils after pickling by immersion in water, this cleansing water may be applied by an overhead spray which can be arranged over the tank in any convenient manner as may be desirable.

We wish it distinctly understood that our machine for pickling coils of wire or rods herein described and illustrated is in the form in which we desire to construct it and that changes or variations may be made as may be convenient or desirable without departing from the salient features of our invention and we therefore intend the following claims to cover such modifications as naturally fall within the lines of invention.

We claim:

1. A pickling apparatus comprising spaced apart upwardly opening fluid tanks, an endless conveyor supported and operated above the tanks and provided with a plurality of swinging horizontal transverse members each suspended from the conveyor by one end and adapted to support vertically a plurality of coils of wire.

2. The device of claim 1 with the addition of means in line with the horizontal transverse members for receiving a plurality of coils of wire in a vertical position with their central openings in line with the horizontal members and means for advancing the groups thus assembled to be engaged by the horizontal member.

3. The device of claim 1 with the addition of means in line with the horizontal transverse members for receiving the coils of wire suspended from the horizontal members and means for withdrawing the plurality of coils off the free end of the supporting member.

4. A pickling apparatus comprising pickling vats, a traveling conveyor supported and operated above the vats and provided with a plurality of pivotally mounted horizontally transverse suspended members each pendent from one end to the conveyor and adapted to carry a plurality of coils of wire into and out of the vats.

5. The device of claim 4 with the addition of means in line with the horizontal members for receiving a plurality of coils of wire in a vertical position with their central openings in line with the free end of the transverse horizontal member and means for advancing the groups thus assembled to be engaged by the horizontal members.

6. The device of claim 4 with the addition of means in line with the horizontal members for receiving the coils of wire suspended on each horizontal member and means for withdrawing the plurality of coils off the free end of the supporting member.

7. A pickling apparatus comprising spaced apart upwardly opening fluid tanks, an endless conveyor provided with a plurality of pivotally mounted horizontally transverse suspended members each pendent from one end to the conveyor and having its lower run movable across and into the tanks, means to vertically oscillate the conveyor while passing through the tanks.

8. A pickling apparatus comprising spaced apart upwardly opening fluid tanks, an endless conveyor supported and operated above the tanks and provided with a plural-

ity of pivotally mounted horizontal transverse members each suspended from one end to the conveyor.

9. A pickling apparatus comprising pickling vats, a traveling conveyor supported and operated above the vats, a plurality of horizontal members extending transversely the path of the conveyor and each suspended transverse from one end to the conveyor.

10. A pickling apparatus comprising pickling vats, a traveling conveyor supported and operated above the vats, a plurality of transverse horizontal members secured to the conveyor so that they will swing in the path of the conveyor but not transversely, said horizontal members being pendent from one end, the other end being unobstructed.

In testimony whereof we affix our signatures.

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HAROLD K. BEACH.