

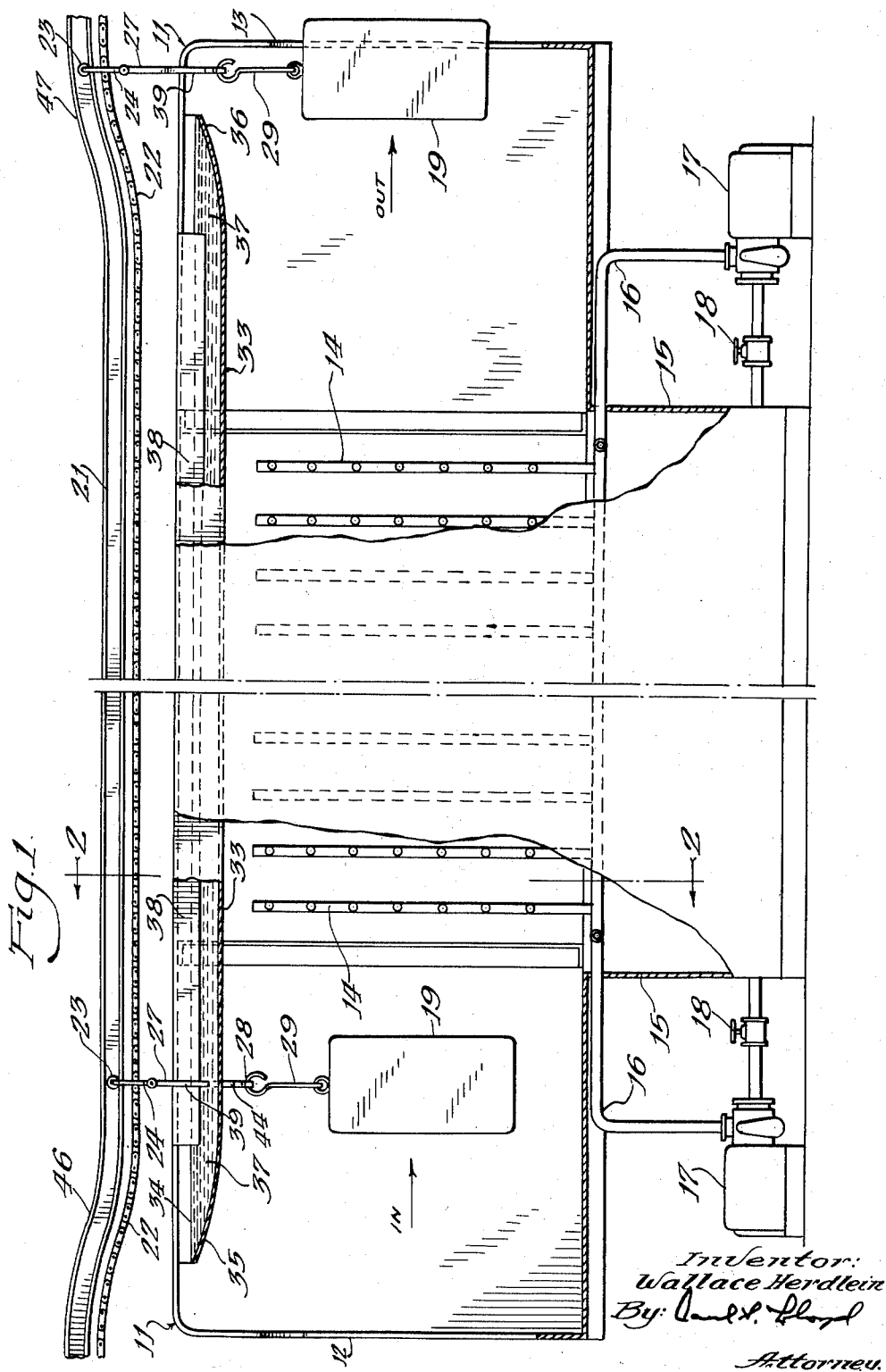
Dec. 25, 1951

W. HERDLEIN
METAL CLEANING AND PICKLING MACHINE AND
CONVEYER SYSTEM THEREFOR

2,579,575

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2 SHEETS—SHEET 1



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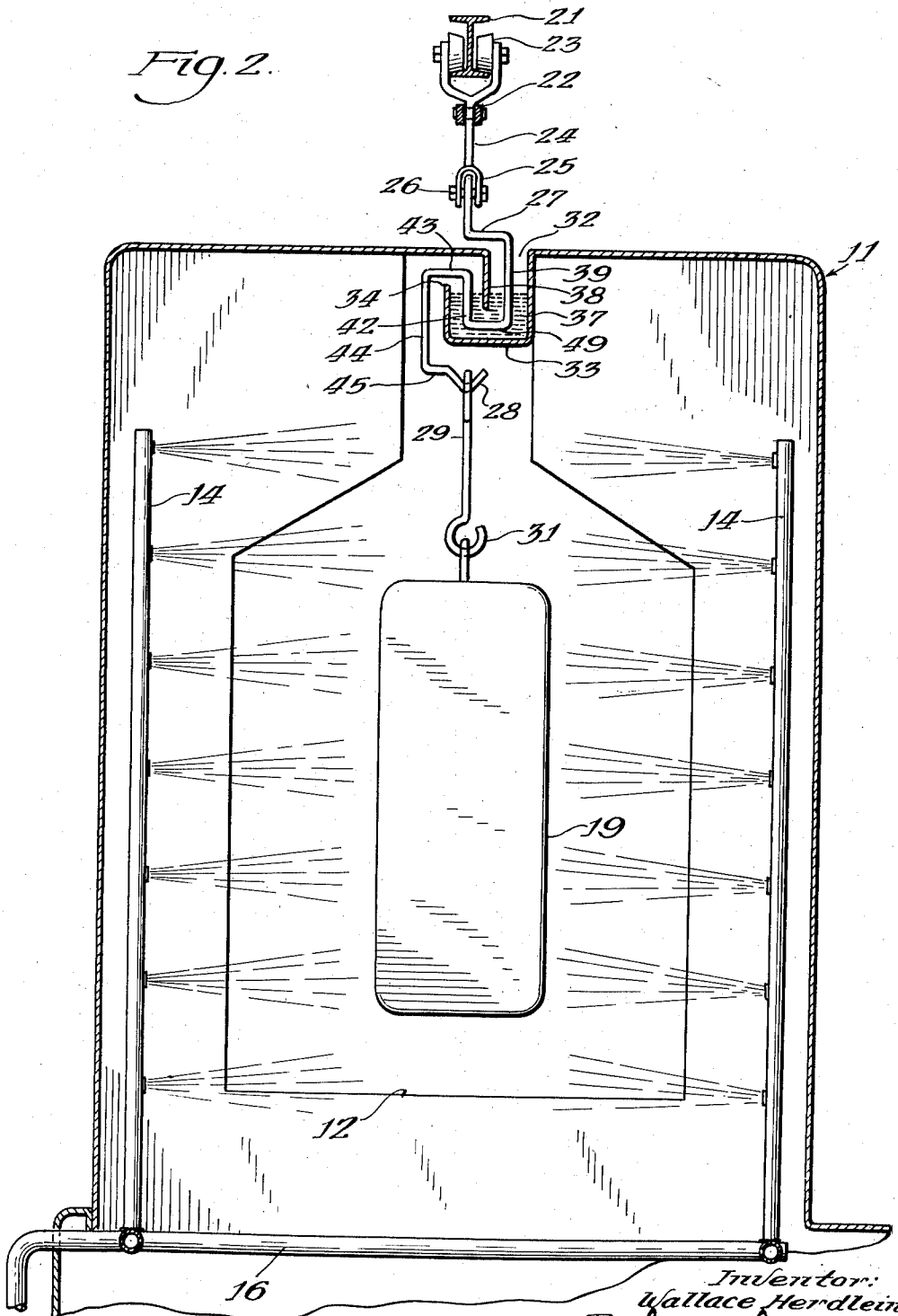
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2 SHEETS—SHEET 2

Fig. 2.



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METAL CLEANING AND PICKLING MACHINE
AND CONVEYER SYSTEM THEREFOR

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7 Claims. (Cl. 134—114)

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This invention relates to metal-cleaning and pickling machines or apparatus in which acids and other chemicals are used in the cleaning and treating operations, some thereof being usually applied by spraying.

Due to the corrosive or other damaging action of the chemicals used the conveyors for transporting the metal articles to be treated through the machine are subject to rapid deterioration when they are mounted inside the enclosure of the machine or apparatus. On the other hand, if the conveyor mechanism is located for the most part on the outside of the enclosure the escape of gases and fumes from the treating materials through the conveyor opening results in the loss of active chemicals and creates objectionable atmospheric conditions.

It is the primary object of my invention to provide for locating the most of the conveyor apparatus outside the enclosure while preventing the escape of fumes and gases from the latter. This is accomplished by means of what I call an hydro-hermetic seal at the conveyor opening as will be later described.

Other objects and advantages of the invention will be apparent from the following description, taken in conjunction with the accompanying drawings, in which:

Fig. 1 is a fragmentary elevational and longitudinal sectional view of a pickling machine or apparatus in which my invention is embodied; and

Fig. 2 is a cross-sectional view thereof taken substantially on the section line 2—2 of Fig. 1.

In these drawings the general apparatus comprising the washing and pickling machine is not shown in detail since this apparatus forms no part of the present invention. It will be understood by those skilled in the art that various operations are performed at different stages in a long enclosure which customarily is doubled back upon itself so as to provide room for housing the various stages in which the metal articles are treated, rinsed and dried.

I have shown simply, and in fragmentary form, a housing 11 having openings 12 and 13 at the entrance and exit ends thereof, respectively, with a spraying apparatus, generally indicated at 14, in the interior thereof. The housing may be supported on a suitable substructure 15 and the spraying apparatus is supplied from pipes 16 leading from suitable pumping apparatus 17, the flow being controlled by the customary valves, such as those shown at 18. The material used for spraying or as a bath, at least that at cer-

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tain of the stages, is acid which gives off strong fumes or gases which have a damaging effect upon the ordinary metallic portions of the apparatus and tend to pollute the atmosphere in which the apparatus is located if they are allowed to escape.

For conveying the metallic articles to be treated, two of which, identified by the reference numeral 19, are shown in the drawings, a conveyor mechanism is provided, the principal parts of which are located above the enclosure 11. Such mechanism comprises a fixed supporting member 21 which may be in the form of an I-beam, a chain 22 and trolleys 23 connected to said chain and riding on the rail or support 21. Each of said trolleys has a depending member 24 provided with a bifurcated end 25 in which there is secured, as by a bolt 26, an article-supporting member 27 which has a hook 28 at its lower end upon which may be supported a link 29 provided with a hook 31 at its lower extremity upon which the article, which may be a metal tray or other fabricated product, is supported.

In the top of the enclosure 11 there is an opening or slot 32 through which the conveyor member 27 extends. Integral with or connected to the material of the top enclosure wall at one side of the slot I provide a trough 33 having a free edge or side wall and being suitably formed at its ends, as indicated at 35 and 36, to cause it to hold a body of water or other liquid, identified by the reference numeral 37. Suitable means (not shown) may be provided for supplying water to this trough and for removing it therefrom, and, if desired, a continuous flow of the water could of course be arranged for.

The trough 33 may, if desired, be constructed as a separate removable element and bolted or otherwise attached to the wall of the enclosure 11 so that the trough may be removed for ready cleaning, repair or replacement.

The part of the top wall of the enclosure at the side of the slot 32 opposite that at which the trough 33 is supported has a downwardly turned flange 38 extending into the body of water 37 when the trough 33 is filled, thereby providing a liquid seal, which I have termed an hydro-hermetic seal, closing the slot 32 against escape of fumes and gases.

The member 27 has an offset portion 39 which extends downwardly into the liquid and is then turned laterally, as indicated at 49, upwardly, as indicated at 42, laterally, as indicated at 43, and downwardly, as indicated at 44, thus providing a

U-shaped component extending around the flange 38. Said member is again bent laterally at 45 beneath the trough 33 and the hook 23 is formed in said last-mentioned lateral portion of said supporting member.

The rail 21 is dipped at the entrance end of the machine, as indicated at 46, to cause the conveyor trolley and the member 27 to move downwardly at this point, thereby causing the U-shaped portion of the member 27 to dip into the liquid in the trough 33. Conversely, said rail has a rise 47 therein at the exit end of the machine to cause said U-shaped portion of the member 27 to rise out of the liquid and clear the trough at the exit end of the apparatus.

While I have shown the apparatus only in general outline it will be understood that in practice the interior of the enclosure 11, the trough 33 and the conveyor member 27, or at least the part thereof which extends into the interior of the enclosure, may be covered with rubber or other suitable coating, or such elements may consist of suitable steel or other material which will withstand the action of the chemicals or of heat, in case the invention is employed in a furnace or other apparatus in which the articles are heat treated. In this connection it may be pointed out that it is contemplated that the construction of my invention may be utilized not only in metal cleaning and pickling machines but in any apparatus where because of fumes or heat it is desirable to seal a conveyor mechanism or other article-supporting elements away from the interior of the machine and to prevent escape of fumes, gases or heat therefrom.

The trough 33 may extend the entire length of the apparatus, thus sealing the conveyor opening or slot throughout its length. This greatly increases the processing efficiency at each stage. It prevents the loss of active chemical fumes, reduces ventilating requirements to a minimum and eliminates the necessity for a tremendous intake of air through an open conveyor slot.

The foregoing detailed description has been given for clearness of understanding only, and no unnecessary limitations should be understood therefrom, but the appended claims should be construed as broadly as permissible in view of the prior art.

I claim:

1. In a metal-cleaning and pickling machine, an enclosure through which the metal articles to be treated are passed and within which they are treated, a conveyor for transporting such articles through said enclosure, means outside the enclosure for supporting said conveyor, a wall of the enclosure having a lengthwise slot therein and said conveyor having an article-supporting member adapted to extend through said slot and formed with an offset intermediate portion, a trough adjacent said slot arranged to contain a liquid through which the offset portion of said conveyor member may pass, and means cooperating with said slot and trough whereby the liquid in the trough provides an hydro-hermetic seal to prevent escape of gases or fumes through said slot.

2. In a metal-cleaning and pickling machine, an enclosure through which the metal articles to be treated are passed and in which they are treated, a conveyor for transporting such articles through said enclosure, means outside the enclosure for supporting said conveyor, a wall of the enclosure having a lengthwise slot therein and said conveyor having an article-supporting mem-

ber adapted to extend through said slot and formed with an offset intermediate portion, and a trough formed in said wall on one side of said slot and arranged to contain a liquid through which the offset portion of said conveyor member may pass, the edge of said wall on the other side of said slot extending into such liquid and the liquid providing an hydro-hermetic seal to prevent escape of gases or fumes through said slot.

3. In a metal-cleaning and pickling machine, an enclosure through which the metal articles to be treated are passed and in which they are treated, a conveyor for transporting such articles through said enclosure, means outside the enclosure for supporting said conveyor, a wall of the enclosure having a lengthwise slot therein and said conveyor having an article-supporting member adapted to extend through said slot and formed with an offset intermediate portion, a trough adjacent said slot arranged to contain a liquid through which the offset portion of said conveyor member may pass, and means cooperating with said slot and trough whereby the liquid in the trough provides an hydro-hermetic seal to prevent escape of gases or fumes through said slot, said outside conveyor supporting means comprising a trolley having a dip therein at the entrance to the enclosure and a rise therein at the exit therefrom whereby said article-supporting member of the conveyor will be caused to dip into the liquid at such entrance and to rise therefrom at such exit.

4. In a metal-cleaning and pickling machine, an enclosure through which the metal articles to be treated are passed and in which they are treated, a conveyor for transporting such articles through said enclosure, means outside the enclosure for supporting said conveyor, a wall of the enclosure having a lengthwise slot therein and said conveyor having an article-supporting member adapted to extend through said slot and provided with an intermediate portion of gooseneck formation, a trough adjacent said slot arranged to contain a liquid through which the gooseneck portion of said conveyor member may pass, and means cooperating with said slot and trough whereby the liquid in the trough provides an hydro-hermetic seal to prevent escape of gases or fumes through said slot.

5. In a metal-cleaning and pickling machine, an enclosure through which the metal articles to be treated are passed and in which they are treated, a conveyor movably mounted above said enclosure for transporting such articles through the enclosure with most of the conveyor structure on the outside thereof, a wall of the enclosure having a lengthwise slot therein and said conveyor having article-supporting members suspended therefrom and adapted to extend through said slot, each said member having an offset portion, a trough adjacent said slot arranged to contain a liquid through which the offset portion of said article-supporting members may pass, and means cooperating with said slot and trough whereby the liquid in the trough provides an hydro-hermetic seal to prevent escape of gases or fumes through said slot.

6. In a metal-cleaning and pickling machine, an enclosure through which the metal articles to be treated are passed and in which they are treated, a conveyor movably mounted above said enclosure for transporting such articles through the enclosure with most of the conveyor structure on the outside thereof, a wall of the enclosure having a lengthwise slot therein and said

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conveyor having article-supporting members suspended therefrom and adapted to extend through said slot, and a trough adjacent said slot arranged to contain a liquid through which a portion of said article-supporting members may pass, such liquid providing an hydro-hermetic seal to prevent escape of gases or fumes through said slot, said trough being integral with the part of the wall on one side of the slot and the edge portion of the wall on the other side of the wall being turned downwardly and extending into the liquid when the trough is filled, the portion of the article-supporting members which passes through said liquid being of U-shape whereby it may clear said downwardly extending edge of said wall.

7. In a processing machine, an enclosure through which the articles to be treated are passed and in which they are treated, a conveyor movably mounted above said enclosure for transporting such articles through the enclosure with most of the conveyor structure on the outside

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thereof, a wall of the enclosure having a lengthwise slot therein and said conveyor having article-supporting members suspended therefrom and adapted to extend through said slot, each said member having an offset portion, a trough adjacent said slot arranged to contain a liquid through which the offset portion of said article-supporting members may pass, and means cooperating with said slot and trough whereby the liquid in the trough provides an hydro-hermetic seal to prevent escape of gases or fumes through said slot.

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