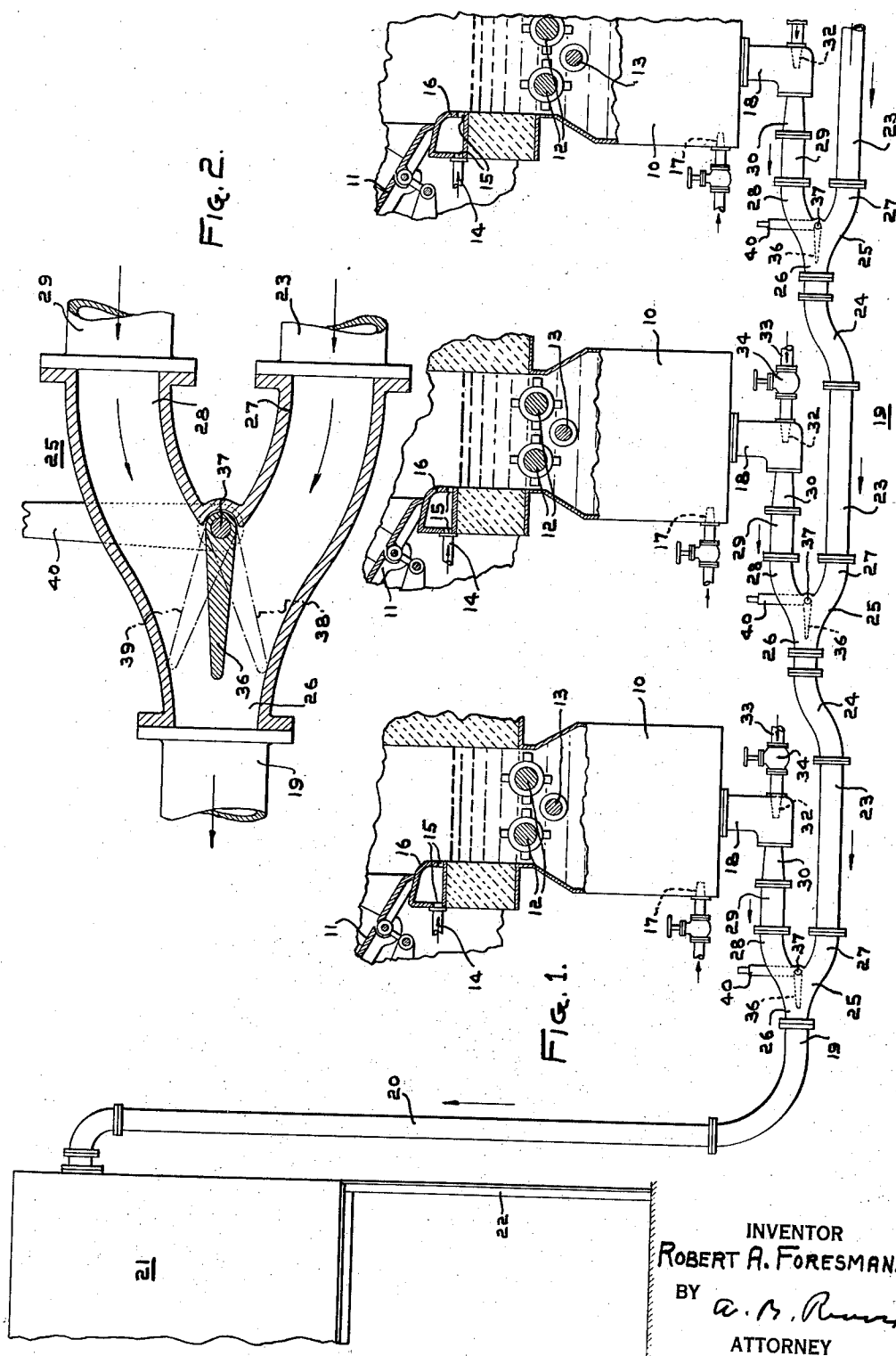


Aug. 12, 1941.

R. A. FORESMAN
MATERIAL HANDLING SYSTEM

2,252,501

Filed Jan. 16, 1940



INVENTOR
ROBERT A. FORESMAN.
BY *a. b. R...*
ATTORNEY

UNITED STATES PATENT OFFICE

2,252,501

MATERIAL HANDLING SYSTEM

Robert A. Foresman, Prospect Park, Pa., assignor
to Westinghouse Electric & Manufacturing
Company, East Pittsburgh, Pa., a corporation
of Pennsylvania

Application January 16, 1940, Serial No. 314,130

6 Claims. (Cl. 302-14)

This invention relates to material handling apparatus, for example, a slag sluicing system, and has for an object the provision of a common sluicing system for a plurality of material storage pits.

A further object of the invention is the provision of a sluicing system for a plurality of ash or slag pits, and so constructed and arranged as to provide a closed system for each pit as it is flushed.

Yet another object of the invention is the provision in a sluicing system, of a plurality of Y members, each Y member containing a flapper valve which is adapted to be positioned automatically by the flow of material therepast.

A further object of the invention is the provision of an ash or slag sluicing system so designed and arranged as to provide for minimum wear and abrasion of the conduits thereof.

These and other objects are effected by the invention as will be apparent from the following description and claims taken in connection with the accompanying drawing forming a part of this application, in which:

Fig. 1 is a schematic view illustrating an application of the invention to a series of ash pits; and,

Fig. 2 is an enlarged sectional view of one of the Y members shown in Fig. 1.

Referring now to the drawing more in detail, there is shown, in Fig. 1, a plurality of ash storage pits 10 adapted to receive ash and other refuse from the discharge ends of a plurality of stokers 11 associated therewith. Preferably, means, such as the rolls 12 and 13, are provided for reducing to suitable size any large pieces of ash or other refuse. Water is supplied to the ash pits in any desired manner, as by means of the conduits 14 and the openings 15 in the hollow wall members 16, for mixing with the ash, such a mixture of water and ash providing for maximum ease of handling and disposal of said ash. If desired, additional means, such as the jets 17, may be provided for creating a mixture of ash and water and for aiding in the discharge of the ash from the pits.

Each of the pits 10 is provided with an ash and water discharge outlet 18 communicating with a common discharge conduit 19. In the embodiment herein illustrated, the conduit 19 is provided with a vertical extension 20 whereby ash and water may be discharged into a raised storage hopper 21 supported by a frame 22. Water may be drained from the ash in the hopper 21 and

the ash discharged directly into vehicles (not shown) for transportation.

The main conduit 19 is comprised by a plurality of sections 23, 24 and 25, the latter sections being in the form of Y members, each comprised by a stem 26 and branches 27 and 28. Each branch 27 is connected to the adjacent section 23 and each branch 28 is connected by the sections 29 and 30 with the discharge outlet 18 of one of the series of pits.

Ejector mechanism 32 is associated with each discharge outlet 18 and is supplied with fluid through the conduit 33, said supply being controlled by the valve 34. Preferably, each section 30 is in the form of a diffuser, and as such cooperates with the ejector mechanism 32 in removing the mixture of ash and water from the pit 10 and its discharge connection 18.

Each Y member 25 is provided with a flapper valve 36 pivotally mounted therein, as at 37, and adapted to be positioned between a first limit, shown in dot and dash lines at 38 in Fig. 2, and a second limit, shown in dot and dash lines at 39. Under certain operating conditions, it is desirable to provide means, such as the handle 40, for manually adjusting the position of the valve 36. Under such conditions, assuming that the middle one of the three ash pits 10 is to be emptied, the valve 36 associated with the left-hand ash pit would be adjusted to the upper position 39 and the valve 36 associated with the central pit to be flushed would be in the lower position 38. With this valve arrangement and the jet valve 34 for the central pit opened, the ash and water from said pit will be carried along the conduits 30, 29, 28, 26, 24 and 23 to the vertical section 20 and thence to the storage hopper 21. It will be apparent that, with the intermediate valve 36 in its lower position 38, backing up of ash and fluid in the main conduit 19 in a direction away from the outlet thereof is prevented.

Under other operating conditions, it may be desirable to have entirely automatic operation of all of the valves 36, in which case the handles 40 thereof may be omitted. Under such conditions, the flapper valves 36 will be positioned automatically by the flow of ash and water therepast.

In order to provide as streamlined a construction as possible, with the object of avoiding undue wear and abrasion of the conduits, such as would take place at relatively sharp turns, the branches of each Y are symmetrically disposed relative to the stem and the main sections 23

of the conduit 19 are disposed with their longitudinal centerlines approximately aligned with the centers of the branches 27 of the Y members. In this manner, relatively sharp turns in the direction of the flow of material are avoided.

In order to provide constant velocity at all points in the flow path of the mixture through the main conduit, each Y member and its valve are so designed that the open passage at the valve, when the latter is at either limit of its movement, has a cross-sectional area substantially equal to the corresponding area at any other point along the conduit or in either branch of the Y members.

While I have shown the invention in but one form, it will be obvious to those skilled in the art that it is not so limited, but is susceptible of various changes and modifications without departing from the spirit thereof, and I desire, therefore, that only such limitations shall be placed thereupon as are specifically set forth in the appended claims.

What I claim is:

1. A material handling system for a series of storage pits containing a mixture of material and water, comprising a discharge connection for each of said pits, a sectional main discharge conduit including a plurality of Y members each having its stem and one branch constituting a section of said main conduit, means providing communication between the other branch of each Y member and one of said discharge connections, ejector mechanism associated with each pit for moving the mixture from said pit to and along the main conduit, and a valve part pivotally mounted within each Y member and adapted to be automatically positioned, between first and second limits of movement, by the flow of said mixture therepast.

2. A structure as specified in claim 1, including means independent of the main conduit for supplying fluid to the ejector mechanism.

3. A structure as specified in claim 1, wherein the longitudinal centerline of the main conduit coincides approximately with the centerline of the said one branch of each Y member.

4. A structure as specified in claim 1, wherein the two branches of each Y member are symmetrically disposed relative to the stem thereof.

5. A structure as specified in claim 1, wherein the flow path of the material through the main conduit, including the Y members and their branches, is of substantially uniform cross-sectional area throughout its length.

6. In an ash sluicing system, a plurality of ash pits, an ash discharge connection for each of said pits, a main ash-carrying conduit comprised by sections and including a plurality of Y members each having its stem and one branch constituting a section of said main conduit, means providing communication between the other branch of each Y member and one of said ash discharge connections, ejector mechanism associated with each ash pit for moving ash from said pit to and along the main conduit, means independent of said main conduit for supplying fluid to said ejector mechanism, and a valve within each Y member and adjustable between first and second limits, said valve, when at said first limit, closing said one branch of the Y member and providing for passage of ash and ejector fluid through said other branch of the Y member to the main conduit, and when at said second limit, closing said other branch of the Y member and providing for flow of ash and ejector fluid therepast along said main conduit from a pit and ejector located upstream from said Y member.

ROBERT A. FORESMAN.