

Aug. 23, 1955

J. H. WILLIAMS

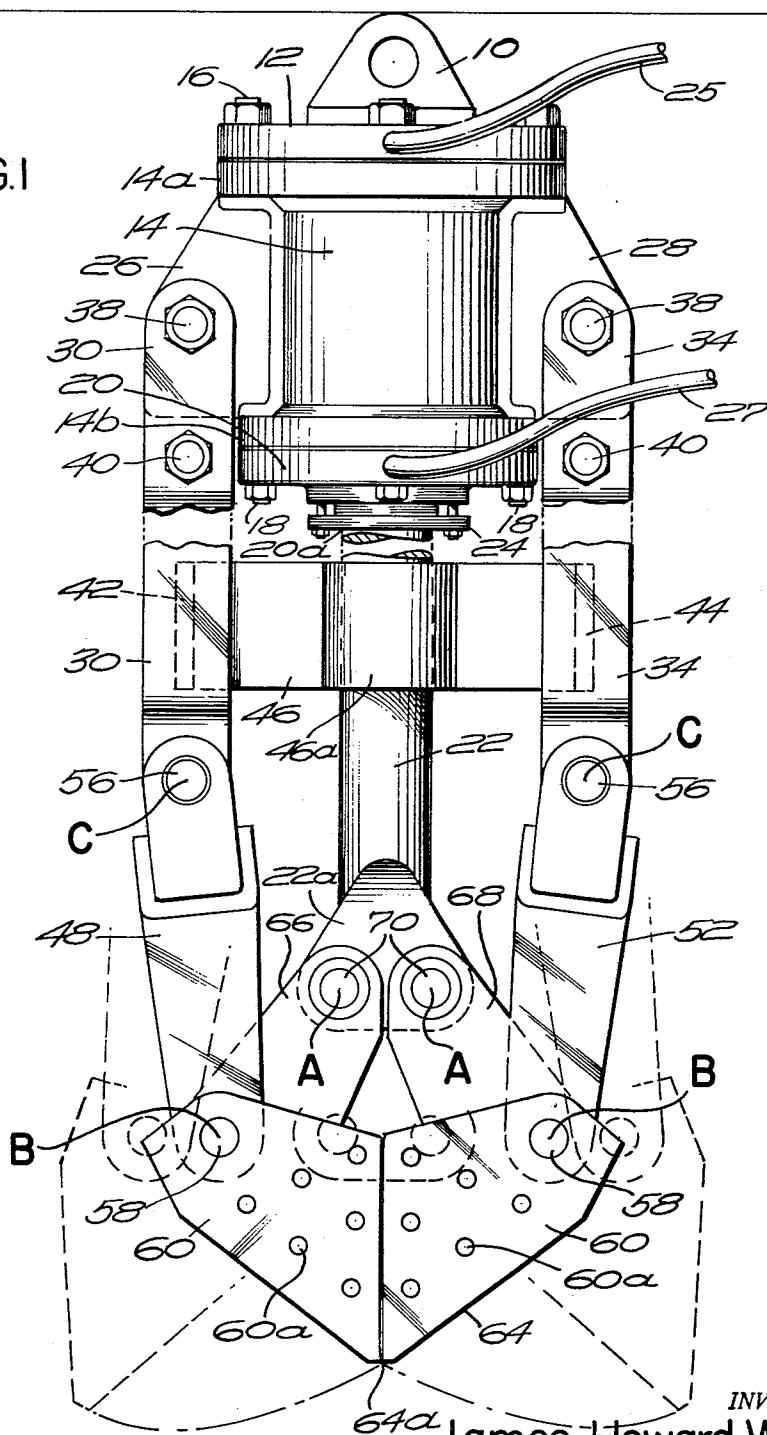
2,715,787

DROSSING BUCKET

Filed Oct. 16, 1951

4 Sheets-Sheet 1

FIG. 1



INVENTOR.

James Howard Williams

BY

Harry Dexter Peck

ATTORNEY

Aug. 23, 1955

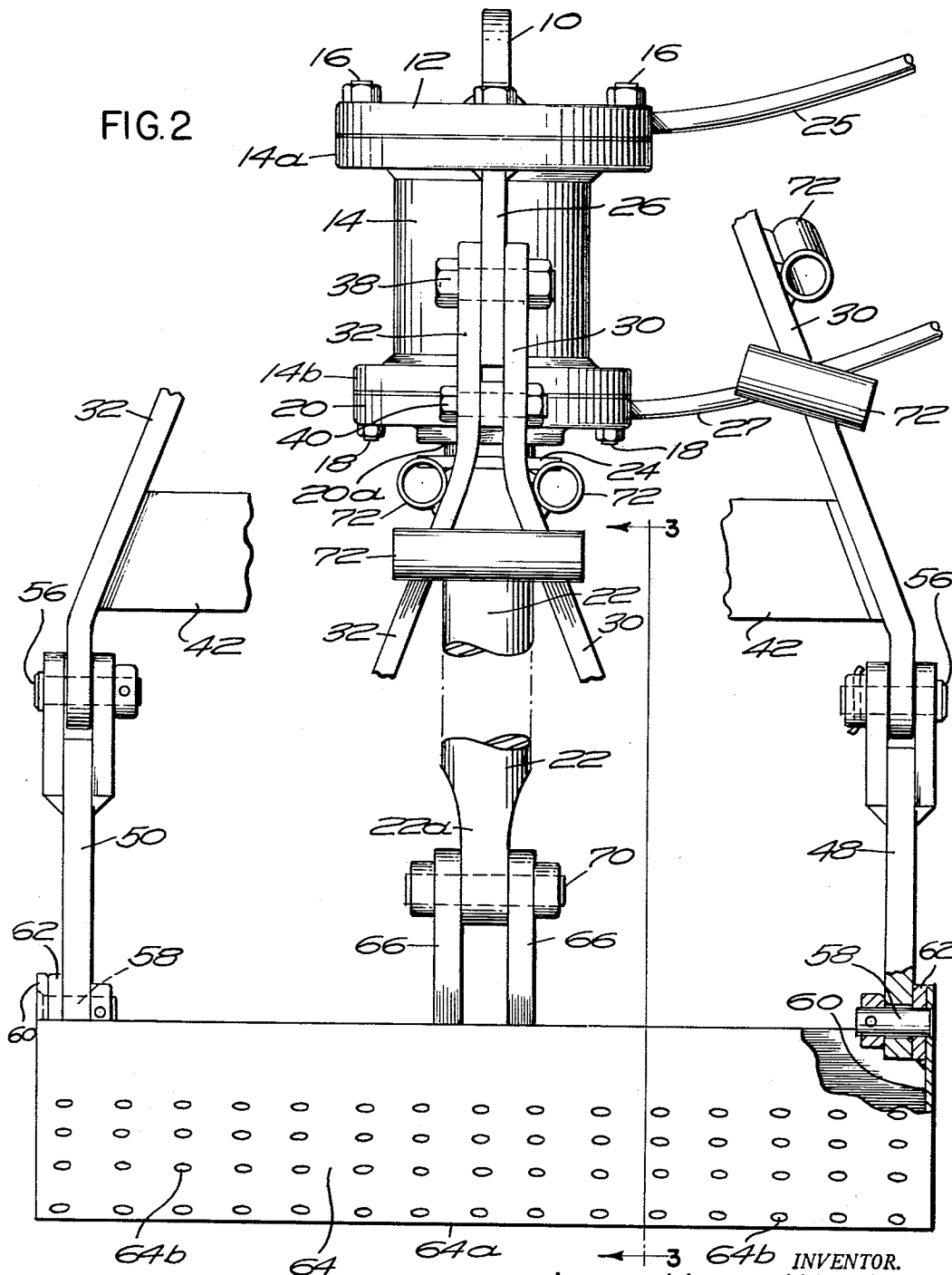
J. H. WILLIAMS

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INVENTOR.
James Howard Williams
BY
Harry Hunter Beck
ATTORNEY

Aug. 23, 1955

J. H. WILLIAMS

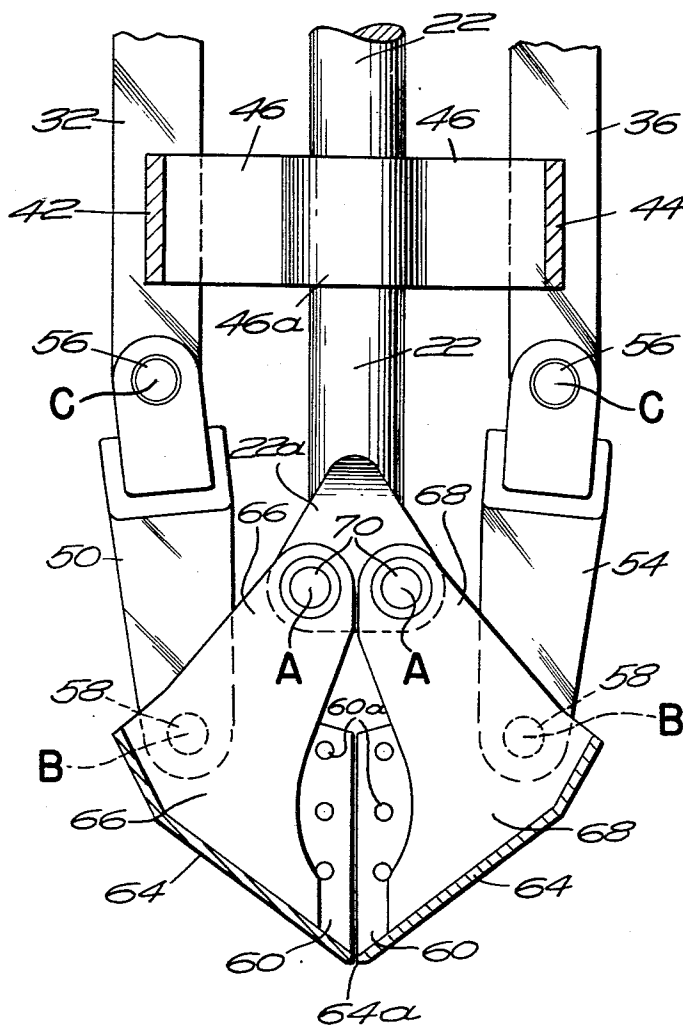
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FIG. 3



INVENTOR.
James Howard Williams
BY
Harry Dexter Peck
ATTORNEY

Aug. 23, 1955

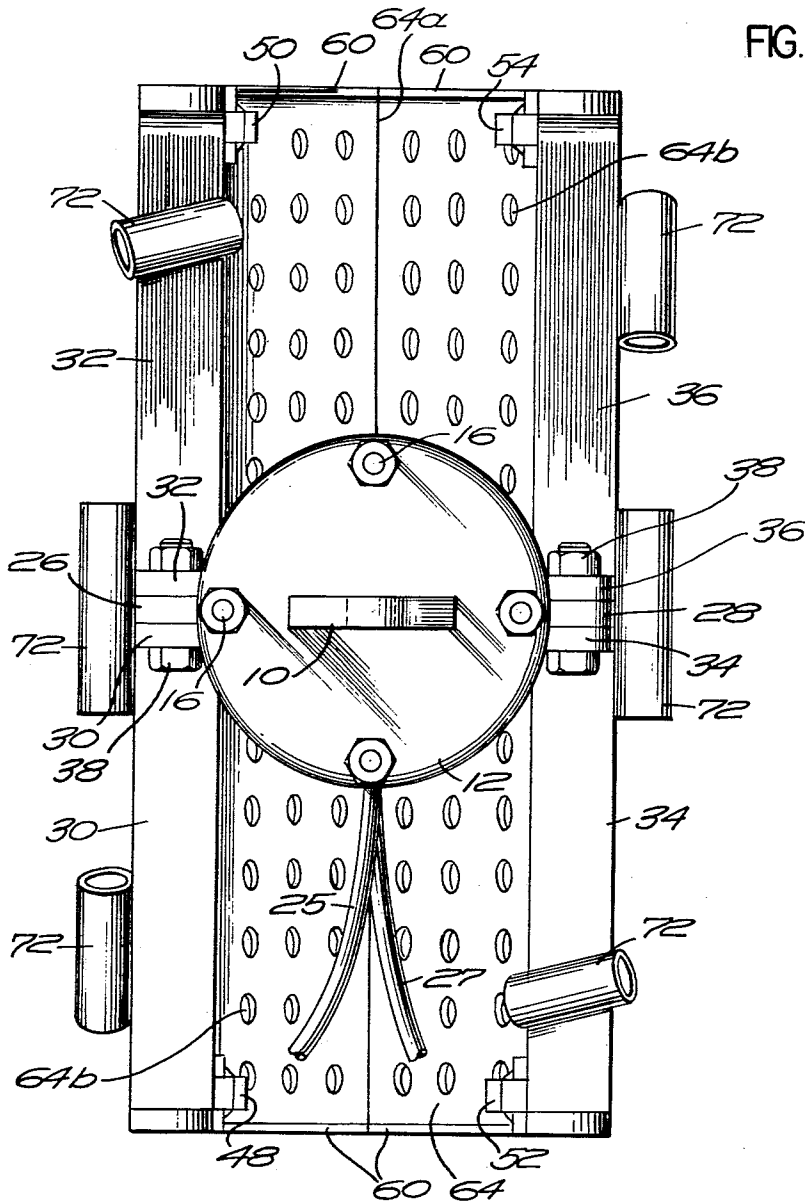
J. H. WILLIAMS

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DROSSING BUCKET

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4 Sheets-Sheet 4



INVENTOR.
James Howard Williams
BY
Harry Dexter Beck
ATTORNEY

1

2,715,787

DROSSING BUCKET

James Howard Williams, Lincoln, R. I., assignor to Grinnell Corporation, Providence, R. I., a corporation of Delaware

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2 Claims. (Cl. 37-188)

This invention relates to improvements in a drossing bucket. More particularly it has to do with means for removing dross from the bottom of a galvanizing kettle. Dross is a sediment which results from the galvanizing process. It accumulates at the bottom of the kettle and must be removed periodically. Hitherto it has been customary to do this by hand the operator using a long handled shovel or scoop which may be partially supported. However this method involves considerable shut-down of the kettle because of the length of time it requires to remove the dross. Moreover it involves real danger to the workmen.

An object of the present invention is to provide a bucket apparatus operated by a self-contained fluid pressure mechanism which is so positioned on the device that it cannot come in contact with the dross to be removed or with the hot galvanizing material above it in the kettle.

Another object of the invention is to provide in a dross bucket of the above described type, means for guiding the travel of the force transmitting member which connects the fluid pressure mechanism with the dross gathering parts of the device, thus permitting the use of a relatively long force transmitting member without the danger of its binding where it enters the fluid pressure cylinder.

The best mode in which it has been contemplated applying the principles of my improvements is shown in the accompanying drawings, but these are primarily illustrative because it is intended that the patent shall cover by suitable expression in the appended claims whatever features of patentable novelty reside in the invention disclosed.

In the drawings:

Fig. 1 is an elevation of a dross bucket apparatus embodying my improvements;

Fig. 2 is a broken elevation of the bucket apparatus as seen 90° from the position shown in Fig. 1, a small portion being shown in cross section;

Fig. 3 is an elevation partly in section taken as on line 3-3 of Fig. 2; and,

Fig. 4 is a plan view of the dross bucket taken as on line 4-4 of Fig. 1.

Referring now more particularly to the drawings the improved bucket apparatus has a suspension eye 10 or equivalent means for attaching the device to a crane boom or other support. This suspension eye is welded to a top closure plate 12, for a cylinder 14, provided with two flanged ends 14a and 14b. A series of studs 16 secure the top plate 12 to the upper flange of the cylinder 14, and another series of studs 18 serve to fasten another closure plate 20 to the lower flange of the cylinder 14.

A piston rod 22 passes through a suitable hole 20a centrally located in the lower plate 20 and has its upper end fastened to a piston (not shown) within the cylinder 14. This hole 20a is provided with a packing gland 24 to prevent leakage of pressure around the piston rod 22. Fluid pressure is introduced into the cylinder above

2

the piston through a hose 25 causing the piston to move downward, and an upward motion of the piston is achieved by introducing fluid pressure into the cylinder below the piston through a hose 27. Fluid pressure is of course exhausted from one hose as it is introduced through the other hose.

Two brackets 26 and 28 are welded to the outside of the cylinder 14 on opposite sides thereof, and extend outward therefrom beyond the flange 14b at the lower end of the cylinder. Four fixed depending frame arms 30, 32, 34 and 36 are secured to these brackets by bolts 38.

In the preferred form of my invention shown in the drawings two of the fixed depending frame arms 30 and 32 are secured to the bracket 26, one on either side thereof and the other two frame arms 34 and 36 are similarly secured to bracket 28. As these fixed frame arms extend downward from their respective brackets they are bent outward as shown in Fig. 2. Similarly these fixed frame arms are bent again into a vertical plane at their lower ends. Bolts 40 serve to prevent the upper vertical portions of the fixed frame arms from spreading under the weight of the load carrying parts which will be presently described.

A cross member 42 fastens the fixed frame arms 30 and 32 together near their lower ends and similarly another cross member 44 fastens together the remaining fixed frame arms 34 and 36 giving the depending parts of the device rigidity.

A guide member 46 interposed between the cross member 42 and 44 and welded thereto is suitably shaped at its center position to form a guide bearing 46a for the piston rod 22 and prevent lateral motion of said piston rod which would cause it to bind in the hole 20a. The use of such a guide bearing makes it possible to have the apparatus of any desired length, so that the fluid pressure mechanism can thus be kept from coming in contact with the material to be moved or with the galvanizing bath.

The load carrying parts of my improved device are partially supported by four movable supporting members 48, 50, 52 and 54 the bifurcated upper ends of which are pivotally secured to the fixed frame arms 30, 32, 34 and 36 respectively by bolts 56 and the lower ends of which are likewise pivotally secured by bolts 58 to the said load carrying parts at side plates 60 thereof. As shown in Fig. 2 each of these side plates 60 has a reinforcing plate 62 welded to it to reinforce the bolt 58 secured to the side plate 60.

In general these load carrying parts comprise two complementary jaw units pivoted in such a manner to the formed lower end 22a of the piston rod 22 that vertical travel of this piston rod causes the jaw units to spread apart or close depending on the direction of the piston rod travel.

More particularly each of these complementary jaw units has a bottom plate 64 at the ends of which the aforementioned side plates 60 are secured, preferably by welding. These side plates are so shaped that when the jaw units are in the closed position each of the side plates of one jaw unit joins the corresponding side plate of the other jaw unit to form a closed side wall across both ends of the load carrying parts.

In this closed position the inner edges of the two bottom plates 64 also join to close the entire bottom of the load carrying parts; and to facilitate the closing movement of the two jaw units through the dross the said inner edges of the bottom plates are suitably tapered to form knife-like edges at 64a.

Force to effect the opening and closing movement of the complementary jaw units is derived from the fluid pressure piston-cylinder mechanism in the upper part

3

of the device. This force is transmitted to the jaw units by the piston rod 22 which is appropriately flattened at its lower end 22a. A portion of this formed lower end fits between a pair of upstanding center plates 66 arranged parallel to the side plates 60 and welded to the bottom plate 64 of one jaw unit, and another portion fits between a second pair of center plates 68 secured in the same manner to the other jaw unit. Bolts 70 passing through these center plates and the portions of the plate 22a which fit between them serve to pivotally connect each of the jaw units to the piston rod 22.

In Fig. 1 of the drawings the solid lines show the jaw units in their closed positions. Fluid pressure has been introduced below the piston forcing it up and affecting an upward travel of the piston rod 22. The jaw units being pivotally connected to the end of the piston rod at A, this upward movement causes the jaw units to turn about their pivot points B where the supporting members 48, 50, 52 and 54 are fastened to the side plates 60, and the jaw units are swung closed.

However, a jaw unit does not merely turn about the pivot point B where its supporting members are secured to its side plates because the distance is fixed between this point B and the point A where the center plates are secured to the piston rod, and the upward movement of the piston rod being in a straight line it follows that the point B must swing inward from the position it assumes when the jaw is open.

To permit these points B to swing the upper ends of the supporting members 48, 50, 52 and 54 are pivotally connected at C to the fixed frame arms 30, 32, 34 and 36 respectively as has been mentioned.

Referring again to Fig. 1 of the drawings, the dotted lines show the jaw units in their open positions. Fluid pressure has been introduced above the piston forcing it down. This time the piston rod 22 pushing down on the center plates 66 and 68 at A causes the jaw units to turn about their pivots B to open the jaw units.

Holes 60a and 64b are provided in the side plates 60 and bottom plate 64 respectively to allow the galvanizing liquid above the dross to run out when the jaws have been closed at the bottom of the tank and the device has been raised above the surface of this liquid preparatory to being swung away from the kettle to dump this dross. Short lengths of pipe 72 are welded to the fixed frame arms 30, 32, 34 and 36 at various points to receive the ends of rods (not shown) which the workmen use to

4

twist and rock the device before the jaws are closed thus making sure that the cutting edges penetrate into the layer of dross at the bottom of the kettle.

I claim:

1. A drossing bucket comprising a cylinder, four depending frame members having their upper ends secured to said cylinder, a supporting arm pivoted to the lower end of each said frame member, complementary jaws pivoted to the lower ends of said supporting arms, a piston rod fixed to a piston within said cylinder extending vertically downward among said frame members and pivotally connected at its lower end to said complementary jaws, a cross member secured between two of said frame members near the lower ends thereof, an additional cross member correspondingly secured between the remaining two frame members, and bearing means secured between said cross members, said bearing means having a central portion which fits around said piston rod and prevents lateral movement thereof, and said bearing means cooperating with said cross members to give the frame members rigidity.

2. A drossing bucket comprising a frame having a plurality of substantially vertically disposed members, fluid pressure responsive means to which the upper end of each said frame member is rigidly secured, supporting arms hinged to the lower ends of said frame members, a substantially vertically movable force transmitting rod arranged centrally within said frame and actuated by said pressure responsive means, cross members rigidly joining certain of said frame members near the lower ends thereof, means rigidly interconnecting said cross members and including a central bearing axially spaced from said fluid pressure responsive means to guide the movement of said rod and give said frame rigidity, and complementary jaws hinged on the lower ends of said supporting arms and hinged on the lower end of said rod for opening and closing movement of the jaws in response to said movement of the rod.

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