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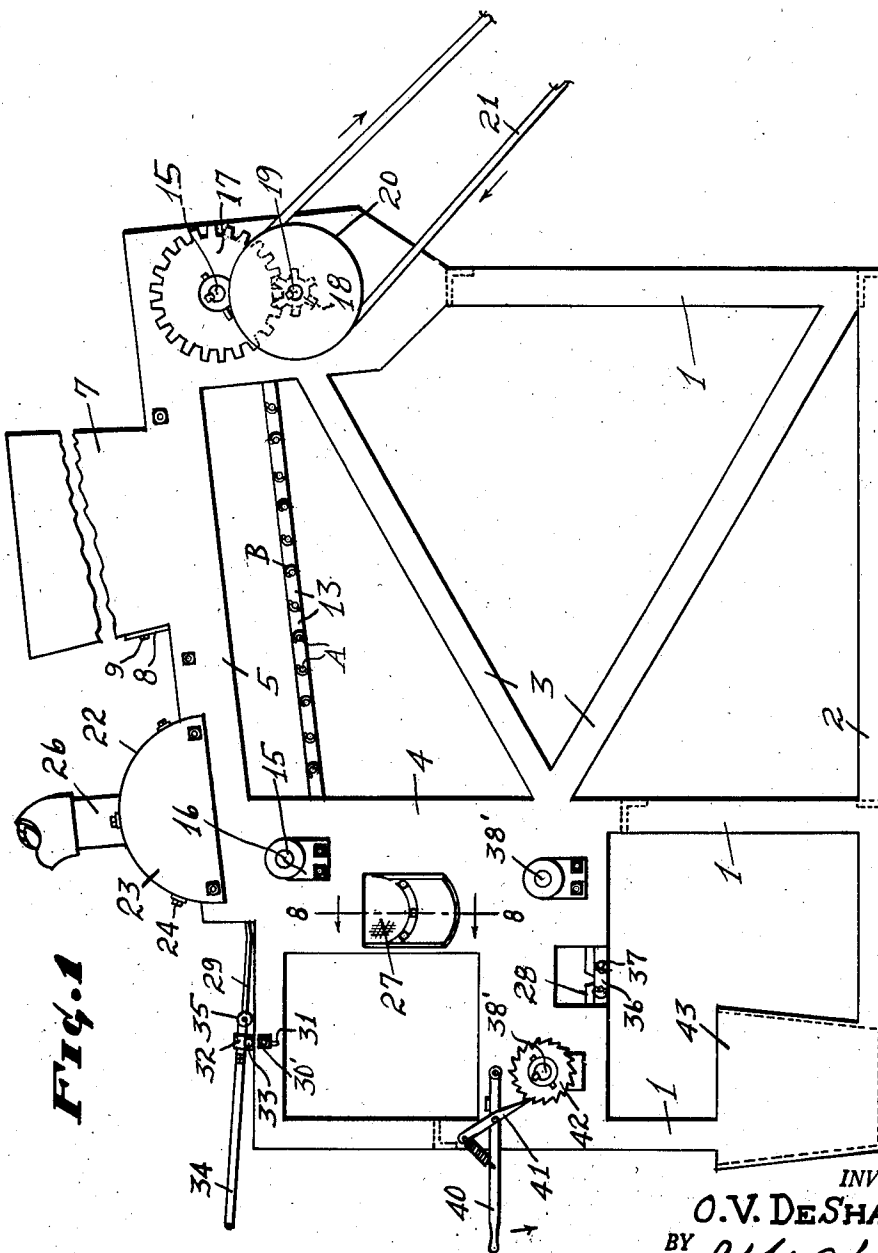
O. V. DE SHAZO

2,392,526

MACHINE FOR EXTRACTING LEAD FROM ITS ORES

Filed July 29, 1944

4 Sheets-Sheet 1



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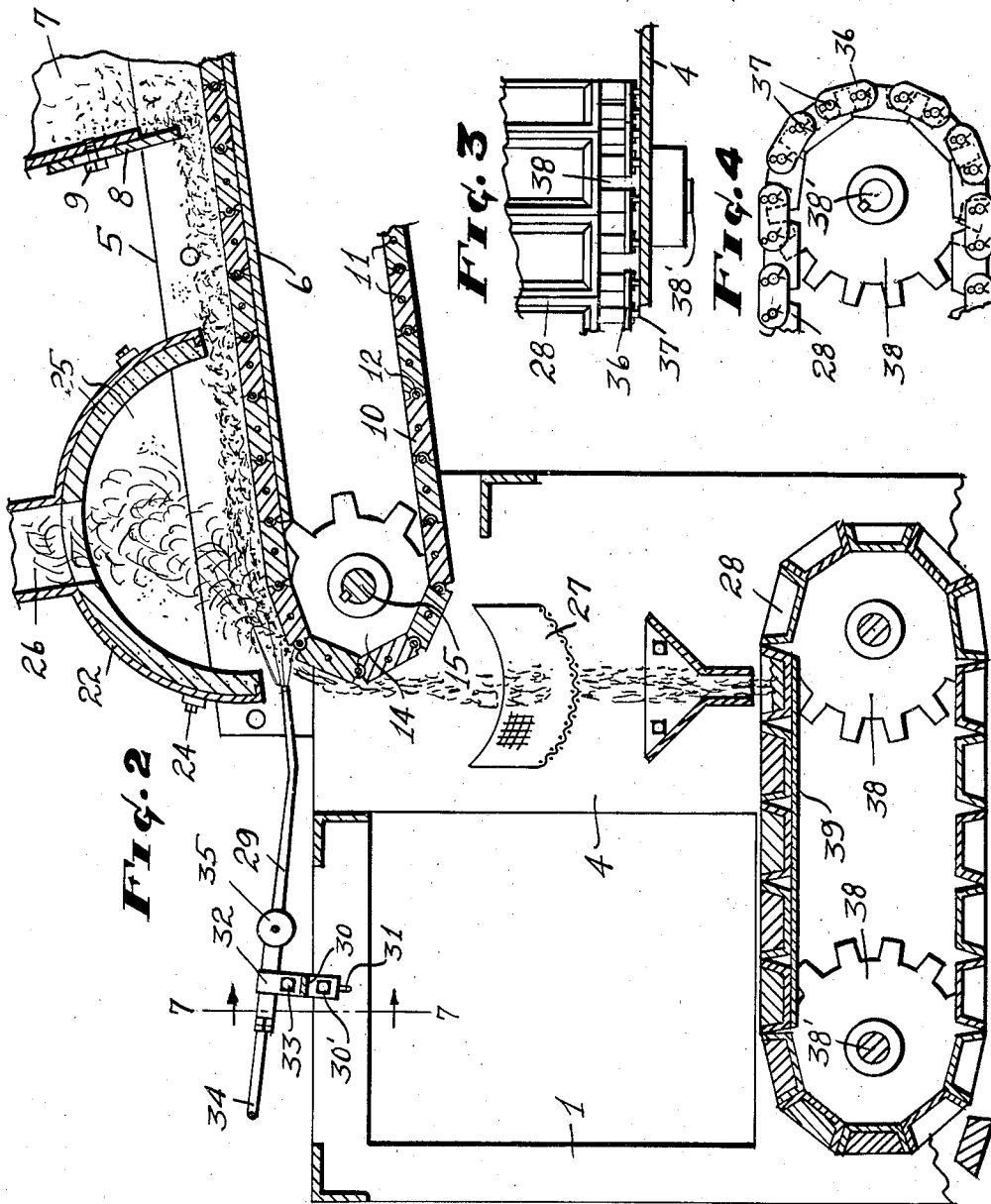
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MACHINE FOR EXTRACTING LEAD FROM ITS ORES

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4 Sheets-Sheet 2



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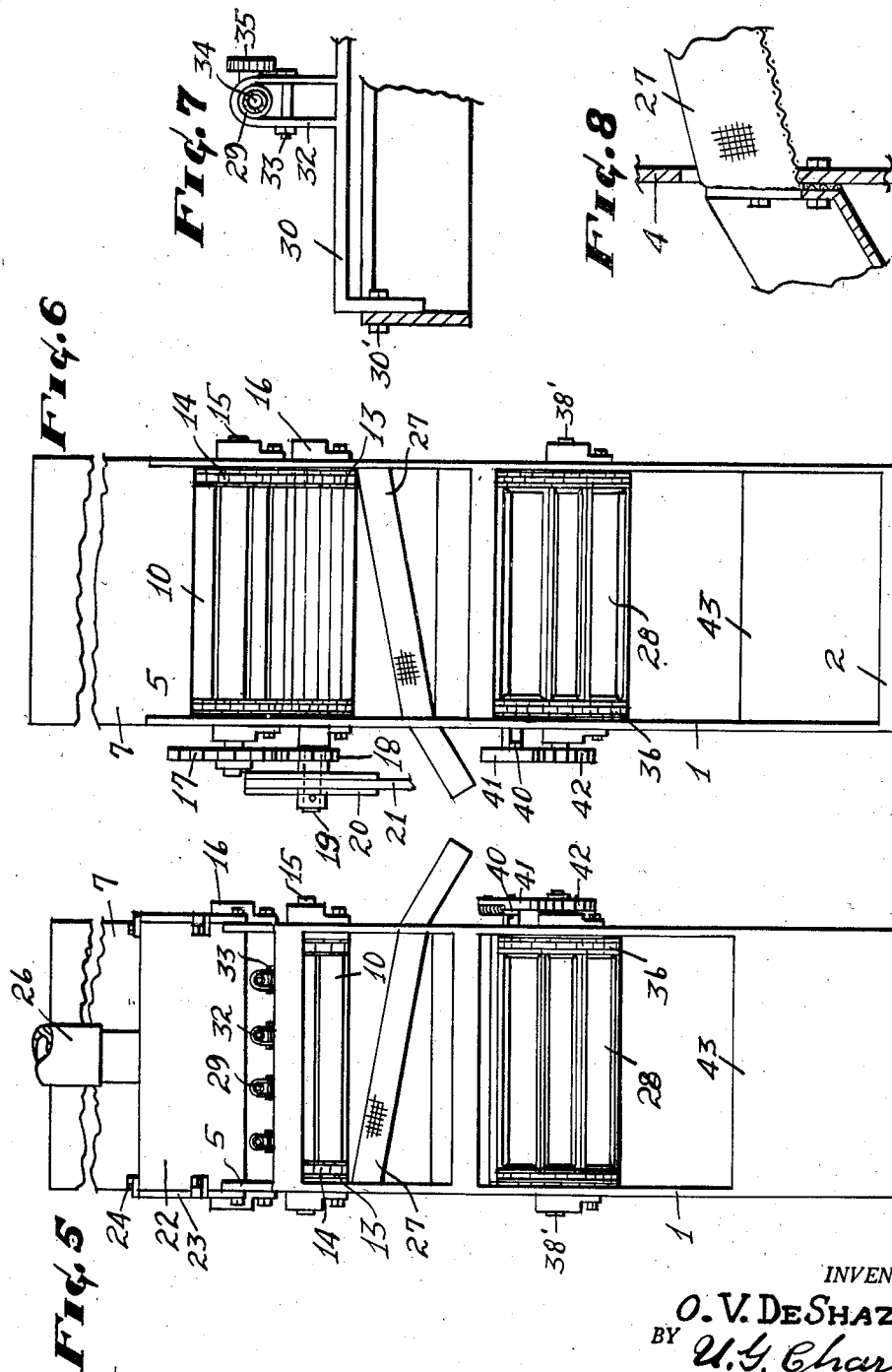
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MACHINE FOR EXTRACTING LEAD FROM ITS ORES

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4 Sheets-Sheet 3



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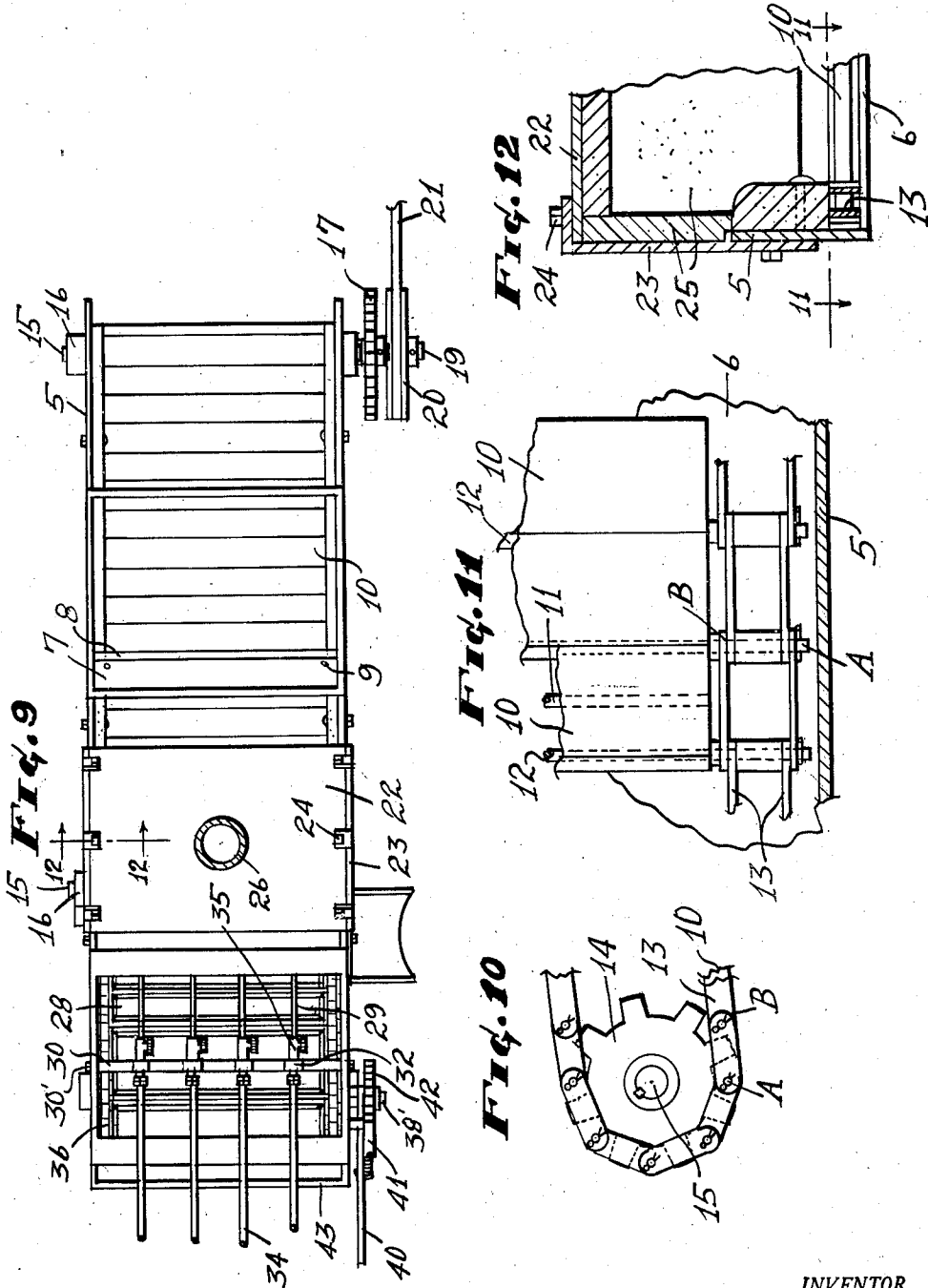
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MACHINE FOR EXTRACTING LEAD FROM ITS ORES

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4 Sheets-Sheet 4



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UNITED STATES PATENT OFFICE

2,392,526

MACHINE FOR EXTRACTING LEAD FROM ITS ORE

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Application July 29, 1944, Serial No. 547,235

1 Claim. (Cl. 266—21)

This invention relates to a machine for extracting lead from its ore and has for its principal object a machine for continuous smelting of ore that is reduced to a powder like comminution termed as lead sulphate, then being delivered to the machine for further treatment, the principle of which is, by the introduction of a high degree of heat produced from burning acetylene gas or the like as the ore is conveyed thereto by the machine.

A further object of this invention is to produce a machine that will automatically mold the lead into bars and dispose of the residue consisting of dust-like substance from which the lead has been removed by fusion, the dust being disposed of by a vacuum fan to remove the same from a retort chamber in which the lead sulphate is conveyed steadily and continuously while the machine is in operation.

A still further object of this invention is to produce a machine for extracting lead from ore that is inexpensive to construct, comparatively small, easily moved from place to place and set for further action.

These and other objects will hereafter be more fully explained, reference being had to the accompanying drawings forming a part of this specification, and wherein like characters will apply to like parts in the different views.

Referring to the drawings:

Fig. 1 is a side elevation of the machine.

Fig. 2 is an enlarged sectional view through the machine longitudinally, parts broken away for convenience of illustration.

Fig. 3 is a corner plan view of the belt conveyor and moulds for bars of lead.

Fig. 4 is an end view fragmentarily of Fig. 3.

Fig. 5 is a front end elevation of Fig. 1.

Fig. 6 is a rear elevation of Fig. 5.

Fig. 7 is an enlarged view of the torch holder having one torch in view, and taken on line 7—7 in Fig. 2.

Fig. 8 is a fragmentary sectional view of the screen and spout taken on line 8—8 in Fig. 1.

Fig. 9 is a plan view of the machine.

Fig. 10 is a side view of one of the chain belt sprockets and conveyor bars.

Fig. 11 is a plan view of a portion of the conveyor, taken on line 11—11 in Fig. 12.

Fig. 12 is a sectional view taken on line 12—12 in Fig. 9, said section also applying to sides of the trough rearward of the retort chamber.

As a more concise description of the invention, it will be seen that the structure consists of a frame comprising legs 1 mounted on a rectangu-

lar frame 2, said legs being stabilized by diagonal brace members 3 and plate 4. Positioned on the top of the frame is a trough consisting of sides 5, a bottom 6, and a hopper 7 at the longitudinal center of the trough, the sides of which and their respective sides of the hopper being integrally joined while their right angle sides are spaced upward from the bottom and has an adjustable plate 8 carried by bolts 9 to function as a gauge for the depth of the lead sulphate conveyed from the hopper to a retort chamber later described.

The conveyor for the trough preferably consists of fire clay bars 10 that are reinforced longitudinally with rods 11 and rods 12, the latter being adjacent the edges of the bars where they meet, last said rods extending outward as at A to engage the knuckle joints B of links 13 of a chain belt whereby the bars are rockably carried by the chain and being in close contact with each other, the edges of the bars being concavo-convex in cross section to coincide with each other whereby one of adjacent bars will carry the edge of the other bar and permit the same to rock as they pass around sprocket wheels 14 that are mounted at the ends of said conveyor trough through the medium of their respective shafts 15 that are journalled in suitable bearings 16 that are secured to the frame of the machine. The shaft at the rear end of the machine extends outward at one side thereof as shown in Figs. 6 and 9 and having secured thereon a gear 17 in mesh with a pinion 18 that is likewise journalled on the frame by a shaft 19 that extends outward and has a sheave 20 secured thereto that is power driven through the medium of a belt 21, the speed ratio being to drive the conveyor belt at a low rate of speed for the purpose later described.

Positioned at the other end of the frame and being removably secured to the sides of the trough is a retort chamber in working relation to the conveyor for lead sulphate, said retort chamber comprised of a metallic shell consisting of a semi-circular member 22, the length of which is equal to the width of the conveyor trough, the ends of said member being closed by heads 23 removably secured by cap screws 24 applied in spaced relation along the circular member as shown. The said metallic portion of the retort chamber is lined with fire clay 25 that coincides with the metallic form as fireproofing means therefor during fusion of lead sulphate conveyed therein. It will be seen that the terminal edges of the semi-circular body of the retort chamber is spaced upward from the conveyor to permit a predeter-

mined depth of the lead sulphate in the trough to pass thereunder but practically close the space while a free circulation of air into the chamber will occur at the other edge during an exhaust outward through pipe 26 that is centrally positioned in the arc of the shell and being conducted by an exhaust fan, or the like, said fan not being included in the drawings, whereby as the mass of lead sulphate is disintegrated, the dust therefrom will be exhausted while the lead in its molten state will flow freely through a screen 27 that is slantingly positioned and extending in length sufficient to cross the width of the conveyor and outward therefrom as screening means for sediment carried by the flowing lead on its path to a chain of moulds 28 that are moved step by step as the same are filled with the molten lead.

The fusion for the separation of lead from the ore, is through the medium of burners 29, a plurality of which is illustrated in Fig. 9, said burners being supported on the frame by a bar 30 having a portion at each end thereof bent at right angle to be engaged by bolts 30', said bolts extending through slots 31 whereby the burners may be raised and lowered and also rocked to slant the burners from a horizontal plane for a desired adjustment so that the streams of burning gas will penetrate the ore as the same is slowly conveyed theretoward. It will be seen that each burner is adjustably carried by its respective U-shaped clamp 32 secured to the bar in spaced relation therealong, the legs of which are tensioned by bolts 33 to secure or release the burners for adjustment toward and from the retort chamber where they enter the mouth thereof. It will also be seen that each said burner has its respective gas supply pipe 34 and valve 35 to control the flow of gas, the source of which is not shown in the drawings.

Referring again to the lead containing moulds, it will be seen that the moulds are rockably carried by chain belts 36 at the ends of the moulds where pins 37 integral with the moulds engage through links of the chain to rockably carry the moulds side by side and the said chains are in mesh with their respective sprocket wheels 38 that are journaled in the said side plates through the medium of their shafts 38', the moulds slidably engaging on a plate 39 that is carried by the frame and moved thereover step by step as filled with the molten lead, the movement of which is

by the rocking action of a lever 40 having a spring tensioned pawl 41 to engage a toothed wheel 42 that is secured to one of the sprocket wheel shafts and by reciprocating movement of the lever the moulds are moved a distance of their width to register with the stream of molten lead as it drains from the retort chamber, and at each movement a mould will gravitatedly discharge its bar of lead as shown in Fig. 2, said bars being received by a container 43 carried by the frame if so desired.

While I have shown and described specific forms for various elements of the invention such as the length and width of the machine and sides of the hopper being integral with the sides of the trough and an exact form for the retort chamber and other elements in the structure not mentioned, I do not desire to be restricted to such exclusively as the same may be modified without departure from the spirit of this invention as lie within the scope of the appending claim.

Having thus described my invention what I claim as new and desire to secure by Letters Patent is:

25 In a machine for extracting lead from its ore, a trough having side walls and a bottom, the side walls being lined inward with fire-proof material, a hopper for the trough near one end thereof, a retort chamber having an opening for its lower 30 extremity and adapted to overhang the other end of the trough, removable and replaceable fire-proof lining for the retort chamber, said retort chamber having a conductor pipe connected thereto at its upper extremity to convey dust-like 35 substance from the chamber, a plurality of acetylene burners directed toward and beneath the retort chamber as disintegrating means for ore as it approaches the opening of the retort chamber, and a conveyor in the trough bottom com- 40 prised of fire-proof cross bars as conductors for ore toward and beneath said retort chamber, a strainer positioned on an incline plane across and beneath the terminal end of the conveyor 45 beneath said retort chamber, conveyor chains and troughs juxta-positioned and secured to the chains, gear means to engage the chains and means to turn the gears manually step by step as the troughs are filled by the molten metal, and frame means to carry components of the 50 machine herein set forth.

ORVILLE V. DE SHAZO.