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Patented May 20, 1902.

G. C. SCOTT.
AMALGAMATING MACHINE.

(Application filed June 29, 1901.)

(No Model.)

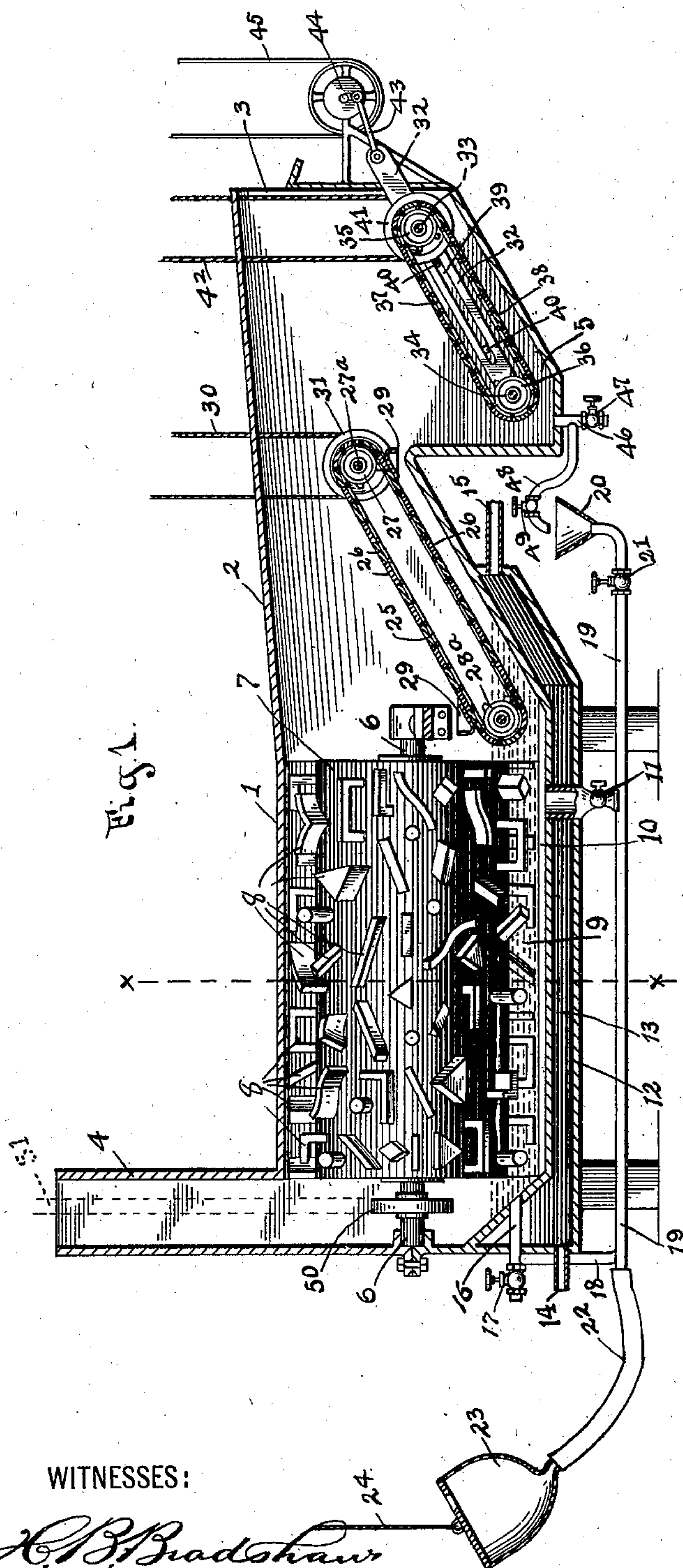


Fig. 1.

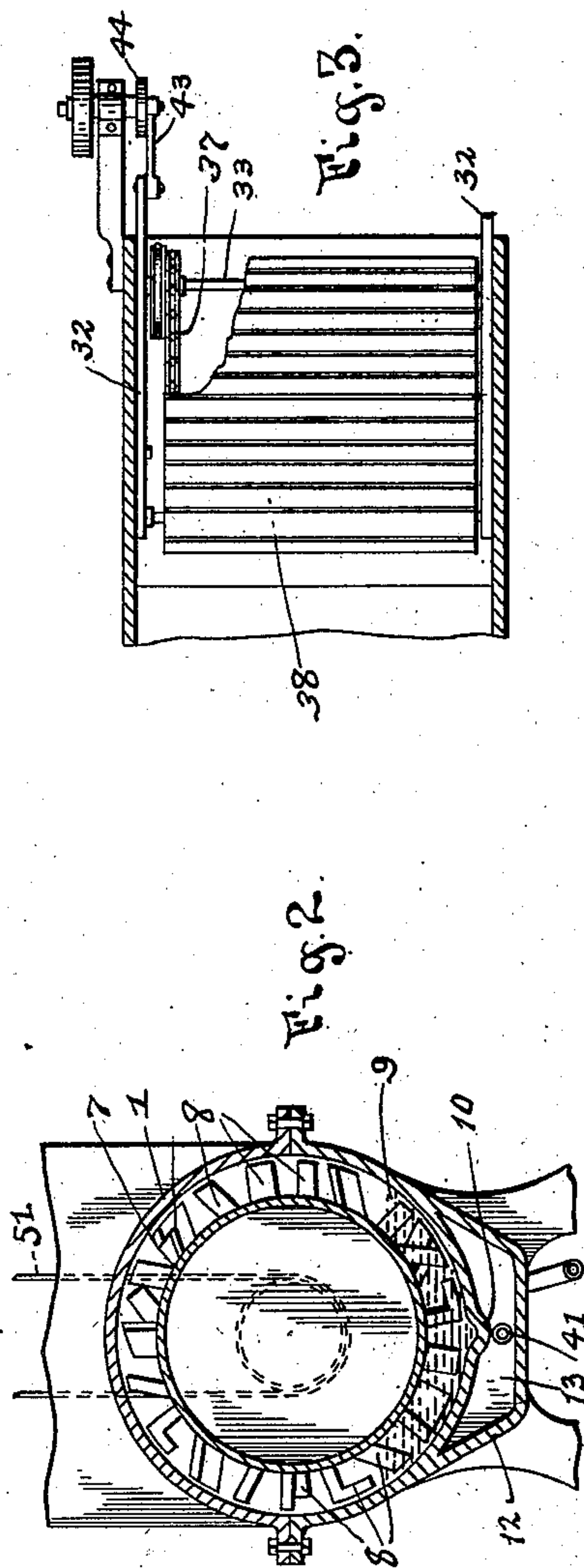


Fig. 2.

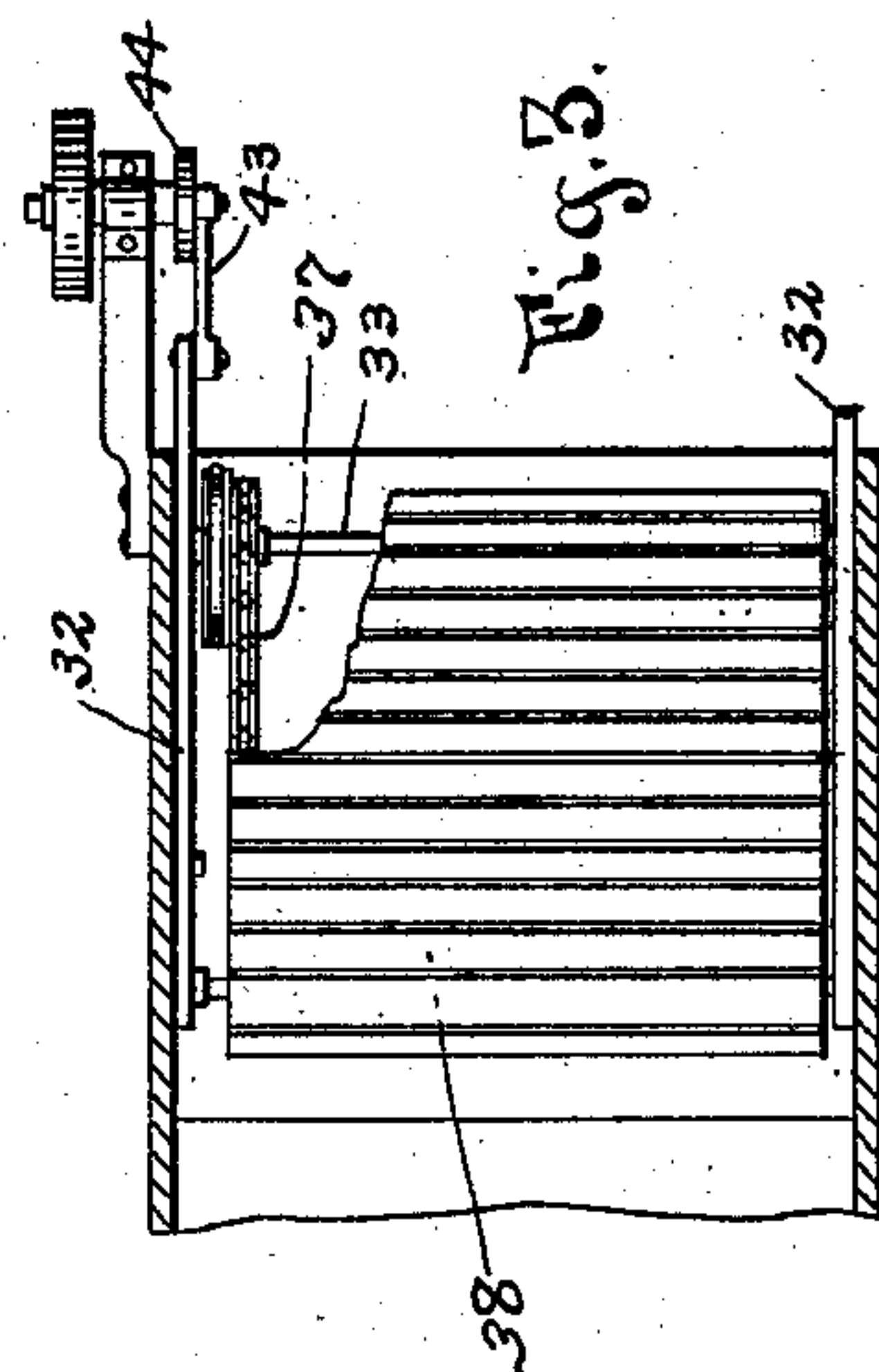


Fig. 3.

WITNESSES:

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AMALGAMATING-MACHINE.

SPECIFICATION forming part of Letters Patent No. 700,379, dated May 20, 1902.

Application filed June 29, 1901. Serial No. 66,462. (No model.)

To all whom it may concern:

Be it known that I, GERARD C. SCOTT, a citizen of the United States, residing at Columbus, in the county of Franklin and State of Ohio, have invented a certain new and useful Improvement in Amalgamating-Machines, of which the following is a specification.

My invention relates to amalgamating-machines of that class which are adapted for the separation of precious metals from ore; and the objects of my invention are to provide an improved machine of this class wherein amalgamating material is carried through and subjected to the action of a body of mercury and wherein the ore-pulp is submitted to the action of the mercurially-treated amalgamating material, to provide improved means for elevating and discharging the tailings, to provide improved means for feeding mercury into and withdrawing the same from the casing, to provide improved mechanism for collecting and removing the concentrates after the free gold has been extracted by the amalgamation process, and to produce other improvements the details of construction of which will be more fully pointed out hereinafter. These objects I accomplish in the manner illustrated in the accompanying drawings, in which—

Figure 1 is a central longitudinal section of my improved machine, showing the amalgamating-drum and its projections in elevation. Fig. 2 is a sectional view on line $x-x$ of Fig. 1, and Fig. 3 is a plan view of the outer elevating mechanism.

Similar numerals refer to similar parts throughout the several views.

In carrying out my invention I employ a suitably-formed casing 1, the latter being formed at one end with an elongation or discharge extension 2, which is preferably inclined upwardly and provided with an outlet-opening 3. At its inner or opposite end the casing 1 is provided with a vertical inlet 4. The outlet extension 3 has its under side provided in its outer portion with a downwardly-extending pocket or offset 5. Within the body of the cylinder 1 are rotatably mounted the projecting end spindles 6 of a horizontally-disposed drum 7, this drum being formed of copper or suitable amalgamating material and having on its periphery amalgamating

projections 8, the latter being of any desired regular or irregular arrangement or formation. As indicated by the dotted lines at 9, the lower portion of the body of the cylinder 1 is designed to contain a body of mercury of such height as to insure the running of the projections 8, as well as the periphery of the cylinder 7, in such mercury when the cylinder is rotated. In the bottom of the cylinder-body 1 is formed a longitudinal mercury pocket or channel 10, while near one end of said casing leads downward a valve-controlled outlet-tube 11. Beneath and about that portion of the casing 1 within which is contained the body of mercury 9 is provided a jacket 12, which serves to form a mercury-heating chamber 13, the latter having an inlet 14 and outlet 15 at opposite ends. Leading into the body of mercury through the end wall of the cylinder or casing 1 is a pipe 16, which may terminate in a valve-controlled outlet-nozzle 17. Leading downward from the pipe 16 is a branch pipe 18, which connects with a lower horizontal pipe 19, the latter having its outer termination beneath the rear portion of the casing extension 2, where it preferably terminates in a funnel-like head or mouth 20. At a suitable point in the pipe 19 I provide a controlling-valve 21. Connected with the inner end of the pipe 19 is one end of a flexible tube 22, which at its outer end connects with a suitably-shaped mercury vessel 23, which may be adjustably supported from any desired point by a supporting-cord 24 or otherwise.

Within the inner and upwardly-inclined portion of the casing extension 2 and near the lower side thereof I provide an upwardly-inclined elevating device which comprises endless chains 25, the links of which are connected by transverse amalgamating slats or plates 26, said chains running over upper and lower sprocket-wheels 27 and 28, carried on transverse shafts 27^a and 28^a. Upon the slats 25 are mounted at suitable points one or more transverse mercury-cups 29, and the sprocket-wheels 28 are so located as to cause the cups 29 to run through the body of mercury 9 when a traveling motion is imparted to the elevating mechanism. Motion may be transmitted to the shaft 27^a through the medium of a suitable endless rope or belt 30, which may run about a belt-wheel 31 on said

shaft. As indicated in the drawings, the upper end of the elevating device last described terminates at such point as to cause the contents of the cups 29 to be discharged into the pocket or offset 5 in the passage of said cups about the upper sprocket-wheels. Within this offset 5 and parallel and adjacent to the lower inclined side thereof I provide a second or outer elevating mechanism which is constructed as follows: Journaled in and between two parallel bars 32 are upper and lower or outer and inner transverse shafts 33 and 34, these shafts carrying upper and lower sprocket-wheels 35 and 36, which are connected by endless chains 37, the links of the latter being connected by transverse amalgamating strips or slats 38. The side bars 32, in which the shafts 33 and 34 are journaled, are provided, as indicated more clearly in Fig. 1, with longitudinally-slotted openings 39, the latter receiving and forming guideways for inwardly-projecting pins or rods 40, which are fixed on the inner sides of the outer portion of the extension 2. The upper or outer shaft 33 also carries a suitable belt-wheel 41, about which may run a comparatively loose belt or endless rope 42, the latter leading outward to a suitable source of power. One of the side bars 32 is provided with an outward extension, which passes through an opening in the outer end of the casing extension 2, this outward extension of said bar 32 having pivotally connected therewith one end of a driving-rod 43, the outer end of which is eccentrically connected with a suitably-journaled wheel 44, which is driven by a belt 45 from a suitable source of power.

In the inner end and bottom portion of the offset 5 of the casing extension 2 and below the inner and lower end of the last-described elevating device I provide a downwardly-extending outlet-pipe 46, the latter having a controlling-valve 47 and having, leading laterally from a point above said valve, an outwardly and thence upwardly and downwardly bent pipe-arm 48, which is also provided with a valve 49. This pipe-arm 48 terminates in such position as to discharge the contents thereof into the flaring mouth or funnel 20 of the pipe 19. Upon one of the end spindles 6 of the drum 7 is carried a suitable belt-wheel 50, about which may pass an operating-belt, the latter running outward through the inlet 4 to a suitable source of power, as indicated by the dotted lines at 51.

In operation the ore-pulp is forced into the casing through the inlet 4 under pressure, and in its passage through said casing and about the drum is subjected to the amalgamating action of the mercurially-treated drum and its projections 8, resulting from the rotation of said drum within the casing and of the passage of said projections through the mercury. Leaving the drum, the tailings pass outward through the outlet extension 2 and through the opening 3, said tailings being assisted in their outward movement by

contact with the moving apron formed by the slats or amalgamating-plates 26, where said tailings are again subjected to the amalgamating action of said slats or plates. It is obvious that in the traveling movement of said slats certain proportions of the mercury will be taken up by the cups 29 and discharged into the extension-offset 5. The heavier portions of the tailings, which pass over the inner elevating device, will fall downward and onto the slats 37 of the outer elevating device, through the traveling motion of which they will be again carried upward toward the discharge-outlet. It will be understood, however, that the concentrates or heavier particles of gold or other precious metal which have not been extracted or detached from the ore through the amalgamating process above described will drop downward from the outer elevator and be discharged through the outlet 46, where they may be collected in any suitable receptacle. This operation of collecting and discharging the concentrates from the outer elevator is facilitated through the fact that when motion is contributed to the wheel 44 it is obvious that a backward-and-forward shaking or reciprocating motion will be imparted to said outer elevator, the side bars 32, which form the elevator-frame, being permitted to slide on the pins or rods 40. By closing the valve 47 and opening the valves 49 and 21 it will be seen that the mercury which has been carried into the offset 5, above described, may be discharged into the pipe 19 and allowed to flow through said pipe and the flexible tube 22 into the mercury vessel or reservoir 23 when the latter has been dropped to a position below the line of the pipe 19. The mercury thus discharged into the reservoir or vessel 23 may be cleansed chemically or otherwise and again returned to the body of the cylinder 1 by closing the valve 21 and elevating the reservoir 23 until the latter is above the level of the pipe 16 and the body of mercury contained in the casing.

From the construction and operation described it will be seen that improved means are not only provided for the amalgamation of the ore, but that improved means are combined therewith for extracting, collecting, and discharging the concentrates remaining in the tailings prior to the discharge of the latter from the machine.

Having now fully described my invention, what I claim, and desire to secure by Letters Patent, is—

1. In an amalgamating-machine, the combination with a casing having an inlet-opening and outlet extension, said casing being adapted to contain a body of mercury and a rotating amalgamating-body within said casing adapted to run through said mercury, of an elevating device contained in said outlet extension, said elevating device comprising outer and inner wheels and a traveling apron connecting said wheels and means whereby

a shaking or vibratory movement is imparted to said elevator, and a movable amalgamating device interposed between said rotating body and elevating device, substantially as specified.

2. In an amalgamating-machine, the combination with a casing having an inlet-opening and outlet extension and adapted to contain a body of mercury, of a rotating amalgamating-body within said casing to run in said

mercury, an elevating device located in said outlet extension, means for operating said elevating device, and an interposed traveling amalgamating-surface having transverse mercury-cups, as and for the purpose specified.

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In presence of—

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