No. 694,112. Patented Feb. 25, 1902.

G. C. SCOTT.

AMALGAMATING MACHINE.

(Application filed June 21, 1901.)

(No Model.)

Fig. 1.

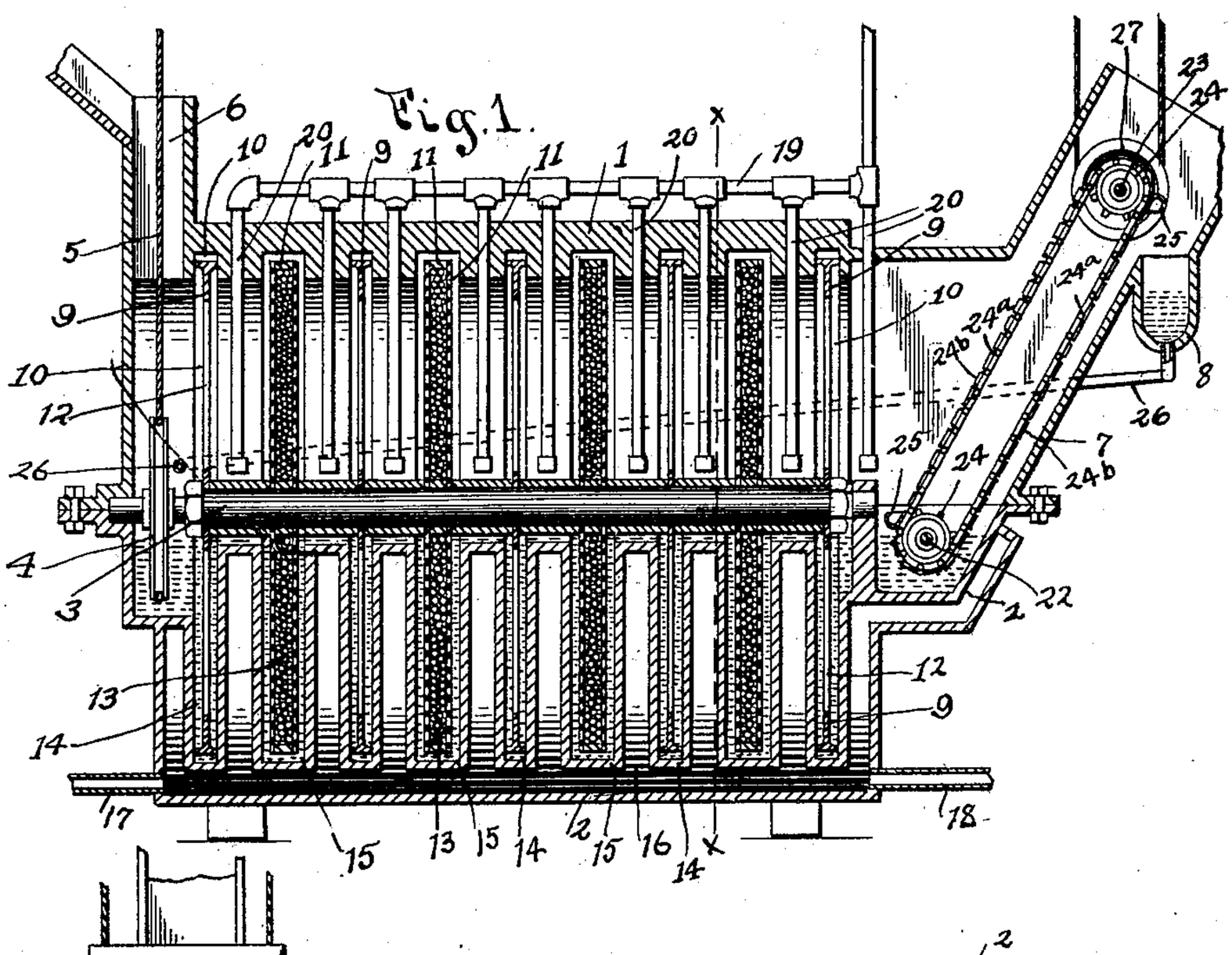

Fig. 2.

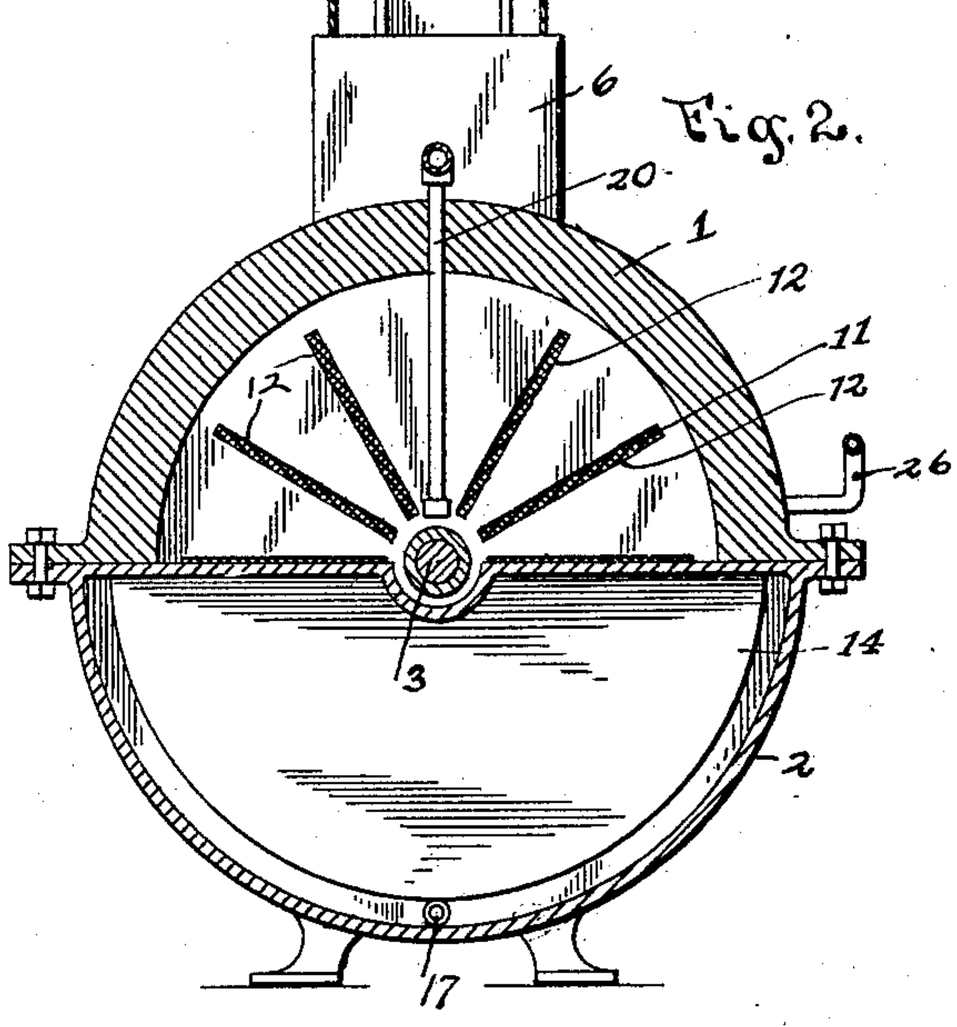

Fig. 3.

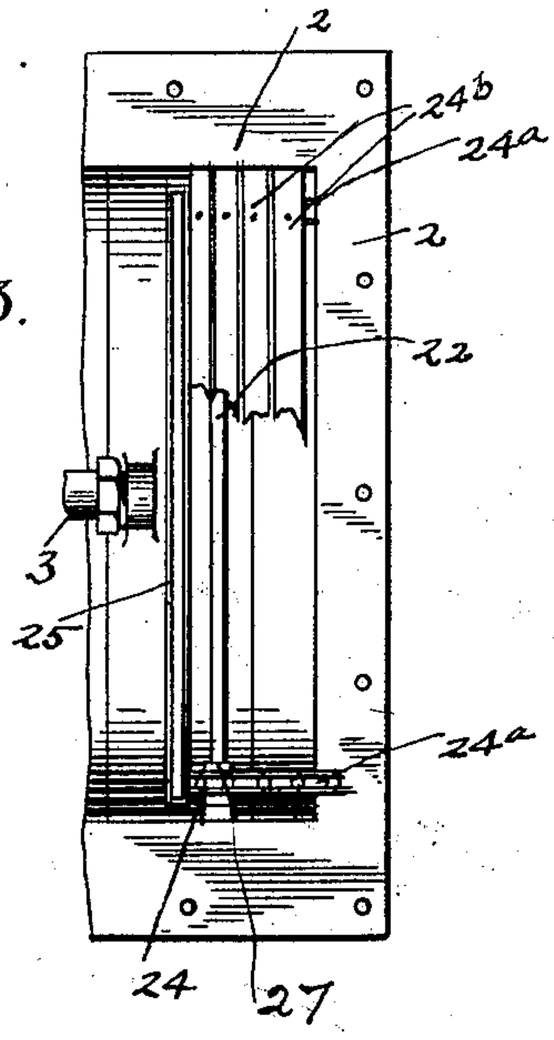

Fig. 4.

WITNESSES:

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AMALGAMATING-MACHINE.

SPECIFICATION forming part of Letters Patent No. 694,112, dated February 25, 1902.

Application filed June 21, 1901. Serial No. 65,397. (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 the improvement of amalgamating-machines; and the objects of my invention are to provide a machine of this class of improved and superior construction whereby the separation of precious metals from the ore-pulp is thoroughly and rapidly accomplished, to provide improved means for subjecting the amalgamating material to a mercurial bath or coating, and to produce certain improvements in details of construction and arrangement of parts, 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 vertical section of my improved amalgamator. Fig. 2 is a transverse section on line *x x* of Fig. 1. Fig. 3 is a plan view of the outer end portion of the lower casing-section; and Fig. 4 is a detail view in section of the lower portion of one of the water-supply-pipe arms, which I employ in the manner hereinafter described.

Similar numerals refer to similar parts throughout the several views.

In carrying out my invention I employ an external suitably-supported casing comprising united semicylindrical upper and lower sections 1 and 2. Journaled centrally and longitudinally within the casing thus formed is a shaft 3, on one end of which is carried a suitable belt or operating-wheel 4, the operating-belt 5 of which passes upward through a vertical ore-pulp inlet 6, formed at one end of the upper casing-section 1. Leading outward and thence upward from the external casing at the opposite end from that having the inlet 6 is a discharge-casing neck or end extension 7, the latter being formed in its upper portion and on its under side with a mercury catch-pocket 8. Mounted at desirable intervals on the shaft 3 are copper disks or amalgamating-plates 9, the outer strengthened edge portions of which are adapted to run in curved recesses or ways 10, formed on the inner surface of the casing-section. I also mount on the shaft 3, between the disks 9, disk-like casings 11, the parallel sides of which are formed of wire-netting or other suitable open-work. As indicated at 12 and shown more clearly in Fig. 2 of the drawings, the plates 9 are provided with slotted openings, which are preferably radially arranged, as shown. I provide the casings 11 with a filling 13, of copper, which may be of the granular nature shown in the drawings or may be in the form of comparatively loosely-packed strips, balls, or blocks of copper. Within the lower casing-section 2 I provide a parallel arrangement of substantially semicircular mercury wells or pockets 14 and 15, the wells 14 being adapted to receive the lower halves or portions of the amalgamator-disks 9 and the wells 15 adapted in like manner to receive and provide a way for the lower half of the disk-like casings 11. As indicated by the dotted lines in the lower half of the external casing, the wells 14 and 15 are adapted to be filled with mercury, while beneath and about said wells said casing is so formed as to provide a steam heating-chamber 16, the latter having an inlet 17 and outlet 18.

From a water-supply pipe 19, which leads above the upper casing-section 1, depend pipe-arms 20, the latter extending downward through said casing-section between the disks 9 and casings 11 to points adjacent to the central shaft 3, and, as indicated more clearly in Fig. 4 of the drawings, the lower end of each of these pipe-arms is provided with a plurality of comparatively small outlet-openings 21. Journaled transversely in the base of the discharge-neck 7 is a sprocket-wheel carrying shaft 22, while a similar shaft 23 is journaled parallel therewith in the upper end portions of said neck and above the mercury-pocket 8. Running over the sprocket-wheels 24 of these shafts are endless chain belts 24^a, the links of which are connected by transversely-arranged and parallel strips or plates 24^b, of copper. The traveling apron or belt thus formed is provided at desirable intervals with transverse cup-bodies 25, of which there may be one or more. As indicated in the drawings, the lower shaft 22 is so located with reference to the machine as to cause said cup or cups 25 in passing about the lower sprocket-wheel 24 to run through the body of mercury. From

the bottom of the mercury-receiving pocket 8 leads rearwardly a pipe 26, the remaining end of which enters the feed end of the outer casing of the machine and is adapted to discharge its contents into the mercury at that end of the machine. Upon the upper shaft 24 I mount a suitable operating-wheel 27.

In practice the ore-pulp from which the precious metals are to be separated is introduced into the machine through the inlet 6 under pressure and passing through the radial openings 12 of the plates 9 and through the comparatively loose amalgamating material contained in the casings 11 is carried to the opposite end of the machine and the tailings discharged through the neck 7. Rotary motion being contributed to the shaft 3, and consequently to the amalgamating-plates 9 and casings 11, it is obvious that during the passage of said pulp through the machine said amalgamating devices will be carried through the mercury contained in their respective wells 14 and 15, with the result that the ore is subjected in its passage through the machine to the amalgamating action of the mercurially-treated plates, casings, and casing contents.

By suitable means rotary motion is contributed to the shaft 23, with the result that a traveling motion is imparted to the chains 24^a, which carry the cups 25 and plates 24^b through the body of mercury contained in the base of the neck 7. The mercury which is thus elevated by said cups is deposited by the latter into the pocket or receptacle 8, owing to said cups being inverted in passing over the upper sprocket-wheel. From this pocket 8 the mercury which has thus been elevated may be returned through the pipe 26 to the opposite end of the machine-casing. In this manner a desirable circulation or movement of the mercury through the wells is obtained, and the mercury contained in the pocket 8 may be subjected to such chemical or other cleaning action as may be deemed desirable prior to its return to the body of the machine. It will also be seen that in carrying the amalgamating-plate 24^b through the mercury contained in the base of the neck 7 said plates are subjected to a mercury-bath, and therefore serve the double purpose of assisting in carrying the tailings up to the point of discharge and of continuing the process of amalgamation on the ore-pulp or tailings thereof which are brought into contact with said mercurially-treated plates.

By providing the water-pipe arms 20 and connecting the same with a supply of water under pressure the water-jets which are thus discharged through the pipe-openings 21 serve to impart a desirable agitation to the ore-pulp contained within the amalgamating-disks and assist in directing the same uniformly through said disks.

While the machine is shown herein as supported horizontally, it is obvious that the same might be supported at a desirable inclination, which would invoke the aid of gravity, and thereby facilitate the passage of the material therethrough.

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

1. In an amalgamator, the combination with a casing having an inlet-opening at one end and an outlet at the other, of a shaft journaled in said casing, of copper disks mounted on said shaft and provided with radially-arranged openings, said casing adapted to contain a body of mercury and said disks adapted to travel through the mercury contained in said casing and casings mounted on said shaft and alternating with said disks, substantially as specified.

2. In an amalgamator, the combination with a casing, said casing having an inlet-opening at one end and a discharge-opening at the other and the lower portion of said casing having formed therein parallel wells or mercury-pockets, of a shaft journaled centrally in the casing 1, amalgamating-plate disks having openings therein and mounted on said shaft, circular casings carried by said shaft and alternating with said disks, said casing adapted to contain a body of mercury and said casings and disks adapted to run through a body of mercury contained in said wells or pockets when the shaft is rotated, substantially as specified.

3. In an amalgamator, the combination with an external casing 1 having an inlet and outlet opening and mercury wells or pockets formed in the lower portion of said external casing adapted to contain mercury, of a central shaft journaled in the external casing and circular casings 11 mounted on said shaft and adapted when the latter is rotated to run in a body of mercury contained in said wells, each of said casings having a filling of amalgamating material, substantially as specified.

4. In an amalgamator, the combination with an external casing 1 having inlet and outlet openings and mercury-containing wells formed in the lower portion of said external casing, of a central shaft journaled in the casing, amalgamating-disks carried on said shaft and running in said wells and water-carrying pipes leading into the external casing and discharging between said disks, substantially as specified.

5. In an amalgamator, the combination with the external casing 1 having an inlet and outlet opening and having mercury-containing wells formed in its lower portion, of a central shaft journaled in said casing, amalgamating-disks 12 having openings therein and casings 11 having open-work sides, said disks and casings mounted on said shaft and said casings having fillings of amalgamating material and both casings and disks adapted to run in said mercury-containing wells, substantially as specified.

6. In an amalgamator, the combination with an external casing 1 having an inlet-opening

at one end and an upwardly-inclined discharge-neck at the other, said discharge-neck adapted to contain mercury and having a pocket depending from and communicating with its outer portion, of a shaft journaled in said external casing, amalgamating-bodies carried on said shaft, an elevating mechanism mounted to run in said discharge-neck and carrying mercury-cups, the lower portion of said elevator adapted to run in a body of mercury contained in the lower portion of the discharge-neck and in the lower portion of the external casing and a pipe connection between the mercury-pocket 8 and the opposite end of the external casing, substantially as specified.

7. In an amalgamator, the combination with an external casing 1 having an inlet-opening at one end and an upwardly-inclined discharge-neck at the other, said discharge-neck adapted to contain mercury and having a pocket depending from and communicating with its outer portion, of a shaft journaled in said external casing, amalgamating-bodies carried on said shaft, an elevating mechanism mounted to run in said discharge-neck and carrying mercury-cups and amalgamating-plates, said cups and amalgamator-plates adapted to run in a body of mercury contained in the lower portion of the discharge-neck and in the lower portion of the external casing and a pipe connection between the mercury-pocket 8 and the opposite end of the external casing, substantially as specified.

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In presence of—
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