No. 689,695. Patented Dec. 24, 1901.

I. H. SPRIGGS.

AMALGAMATOR AND CONCENTRATOR.

(Application filed Feb. 14, 1901.)

(No Model.)

Fig. 1.

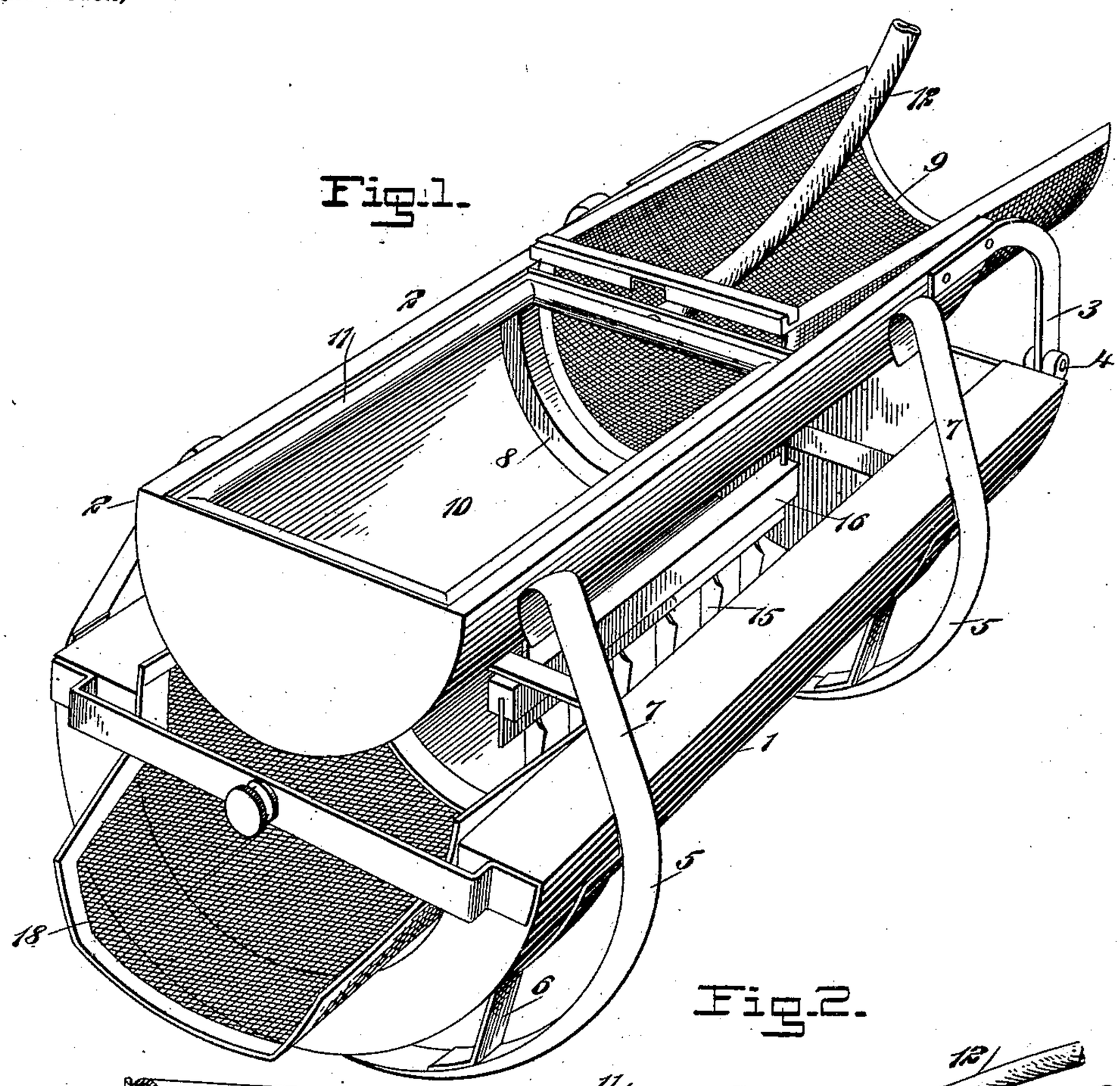
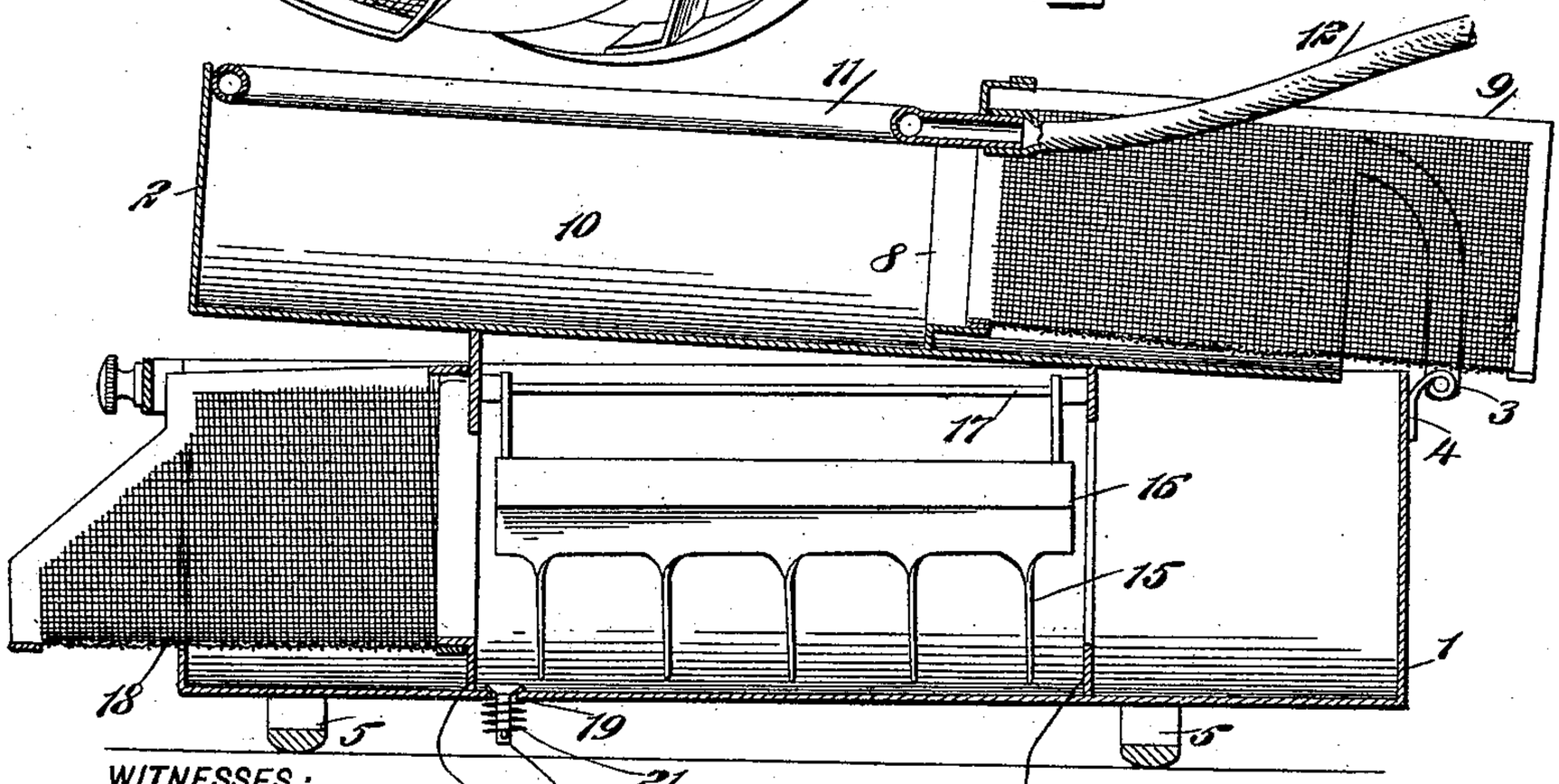


Fig. 2.



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AMALGAMATOR AND CONCENTRATOR.

SPECIFICATION forming part of Letters Patent No. 689,695, dated December 24, 1901.

Application filed February 14, 1901. Serial No. 47,247. (No model.)

To all whom it may concern:

Be it known that I, IRWIN HERBERT SPRIGGS, a citizen of the United States, and a resident of Eureka, in the county of Juab and State of Utah, have invented a new and Improved Amalgamator and Concentrator, of which the following is a full, clear, and exact description.

This invention relates to improvements in concentrators and amalgamators for precious metals; and the object is to provide a machine of this character particularly adapted for recovering the values from loose ground, clay, or gravel, and from other dirt and sand containing gold.

I will describe an amalgamator and concentrator embodying my invention and then point out the novel features in the appended claims.

Reference is to be had to the accompanying drawings, forming a part of this specification, in which similar characters of reference indicate corresponding parts in both the figures.

Figure 1 is a perspective view of an apparatus embodying my invention, and Fig. 2 is a sectional side elevation of the same.

The apparatus comprises a main tray 1 and a feed-tray 2, supported thereon. The feed-tray 2 at its outlet end has downwardly-curved arms 3, which have pivotal connection with lugs 4, secured to the end of the tray 1. Therefore this feed-tray 2 may be swung upward and downward relatively to the lower or main tray. When in its operative position, however, this feed-tray 2 extends longitudinally over the tray 1 and at a slight downward inclination toward its discharge end. The two trays are mounted on rockers 5, which are attached to the lower tray 1 by means of plates 6, and these rockers will preferably be of resilient metal, so that by their spring they will aid somewhat in the rocking of the apparatus during its operation. The upper ends of the rockers are extended upward, as at 7, to engage against the sides of the feed-tray 2, holding it firmly in position and preventing any lateral movement thereof.

It will be noted that each tray is semicylindrical and that the upper tray is provided at its center portion with a riffle 8, and below this riffle is a semicylindrical screen 9, which is separated somewhat from the bottom of the tray 2, as clearly indicated in Fig. 2, and it also extends beyond the end of said tray 2 and also beyond the end of the tray 1. The tray 2, however, is somewhat shorter than the tray 1, so as to leave a space for discharging into one end of said tray 1.

Extended around the upper edge of a portion 10 of the tray 2, which may be termed the "hopper" or "receiver," is a perforated pipe 11 for discharging water onto the material placed in said hopper-section. Water may be supplied to the perforated pipe 11 by any suitable means. I have here shown it as in connection with a hose or flexible pipe 12, which may lead from any desired source of supply.

The tray 1 is provided with riffles 13 and 14, and between these riffles is a swinging agitator consisting of fingers 15, depending from a bar 16, mounted to swing on a rod 17, and at the outlet end of the tray 1 is a semicylindrical sieve 18, placed above the tray, which has its end extended beyond the end of said tray. In the bottom of the section of the tray 1 containing the agitator is an opening 19, designed for the discharge of concentrates. This opening is controlled by a plug-valve 20, held in its closed position by means of a spring 21 and adapted to be opened automatically by the rocking motion of the apparatus, as will be hereinafter described.

In operation the clay, sand, or other material containing values is to be placed in the section or hopper 10. It may be here stated that when the values are contained in clay alone it will be found expedient to mix a certain proportion of gravel therewith, which during the rocking motion of the apparatus will help to grind and separate the particles. After turning on the water-spray the apparatus is to be rocked by any suitable means, and the mixed clay, water, and values will pass over the riffle 8, where the heavier particles—that is, the gold—will settle upon the sieve 9 and pass through the same into the first section of the tray 1. The coarse material or tailings or a greater portion thereof will pass off over the end of said screen 9. The material in the tray 1, which is arranged at a slight downward angle toward its discharge end, will pass into the chamber con-

taining the agitator 15. If desired, quicksilver may be placed in this section of the device in order to take up or amalgamate with the gold. In such case the wall of this section of the tray should preferably be of copper. When amalgamation is not desired, or when quicksilver is not used, the concentrates will settle at the bottom and move toward the opening 19, and every time the apparatus reaches its substantially vertical position the valve 20, by engaging with a suitable trip, such as a piece of wood or the like, placed under the same will be raised upward, allowing the concentrates to pass out through said opening and accumulate in a pile underneath the apparatus, from where they may be readily removed without at any time stopping the machine. The clay, sand, or the like held in suspension by the water will pass over the sieve 18, and any gold or other values that may be contained therein will sink to the bottom of the sieve and discharge into the end of the tray 1.

It is to be understood that the agitating device may be placed in any other part of the apparatus or it may be wholly omitted, if desired.

By the peculiar rolling or rocking motion of the apparatus it will not only handle successfully all earth that may be worked by any other machine, but its success in saving values in clay is very marked, the only material difference being that clay will not come through as rapidly as loose earth. The peculiar concentrating action of the machine completely grinds the particles of clay, making it a solution from which the values rapidly sink, and, further, rusty gold will be so polished as to permit the free action of the quicksilver upon it.

Having thus described my invention, I claim as new and desire to secure by Letters Patent—

1. An ore amalgamator and concentrator, comprising two semicylindrical trays one arranged above the other, rockers of resilient metal attached to the lower tray, the said rockers having upwardly-extended portions to engage the sides of the upper tray, and means for supplying water to the feed end of the upper tray, substantially as specified.

2. An ore amalgamator and concentrator, comprising two semicylindrical trays one arranged wholly over the other and mounted to rock, a riffle in the upper tray, a semicylindrical sieve extended from said riffle beyond the outlet end of the tray and adapted to discharge material into the lower tray, and a perforated water-pipe extended around the hopper or feed section of said upper tray, substantially as specified.

3. An ore amalgamator and concentrator, comprising two semicylindrical trays arranged one wholly over the other, rockers on which said trays are mounted, a pivotal connection between the two trays at one end, a sieve at the outlet end of the upper tray, and a sieve arranged above and extended beyond the outlet end of the lower tray, substantially as specified.

4. An ore amalgamator and concentrator, comprising two semicylindrical trays arranged one above the other, rockers on which said trays are supported, means for supplying water to the upper tray, an agitator in the lower tray operated by the rocking movement of the trays and an automatically-operated valve for an outlet in the lower tray, substantially as specified.

In testimony whereof I have signed my name to this specification in the presence of two subscribing witnesses.

IRWIN HERBERT SPRIGGS.

Witnesses:

ANGUS J. URQUHART,

P. STILLMAN.