

(No Model.)

E. M. RICH.
ORE CONCENTRATOR.

No. 604,920.

Patented May 31, 1898.

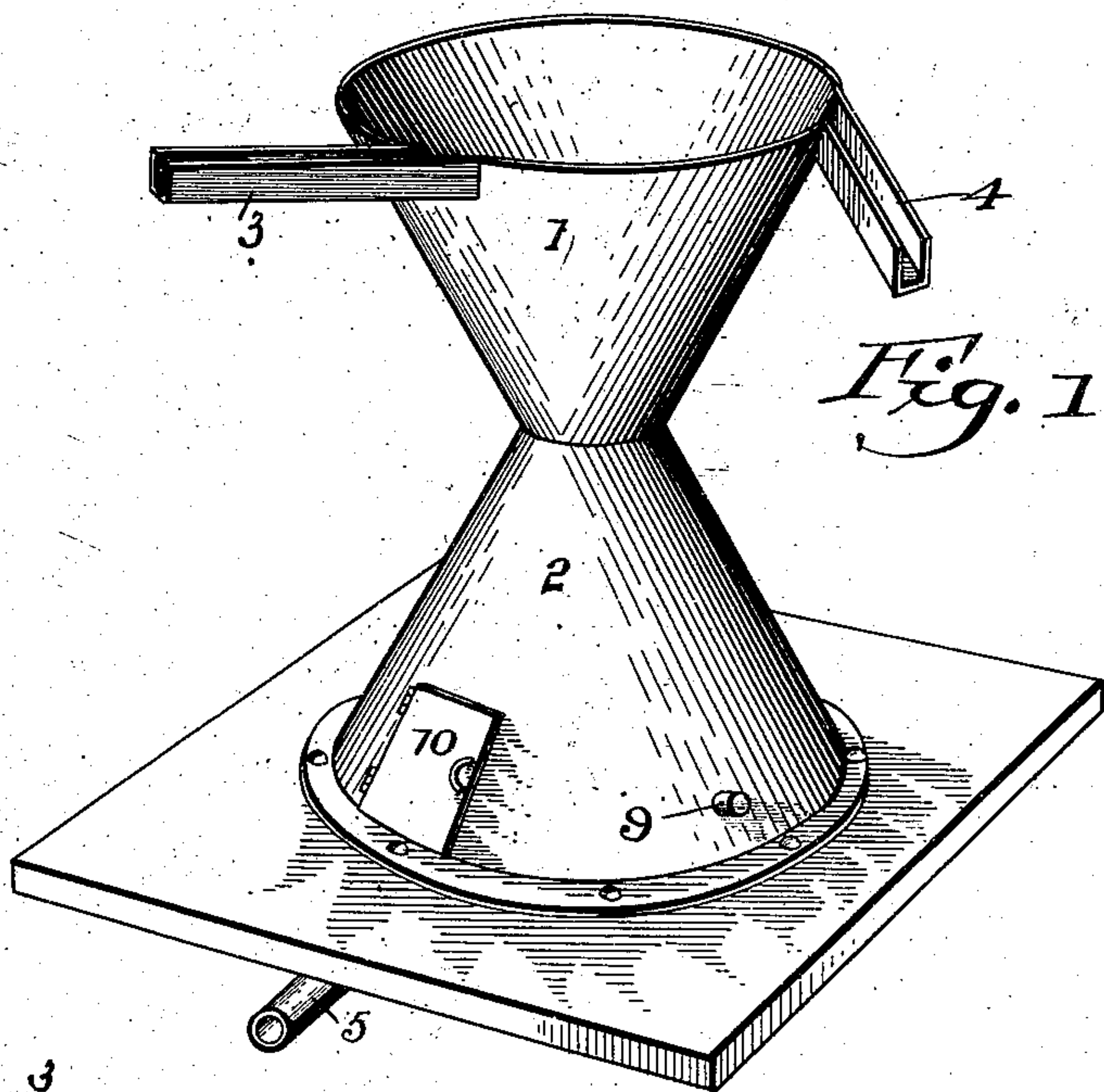


Fig. 1.

Fig. 4.

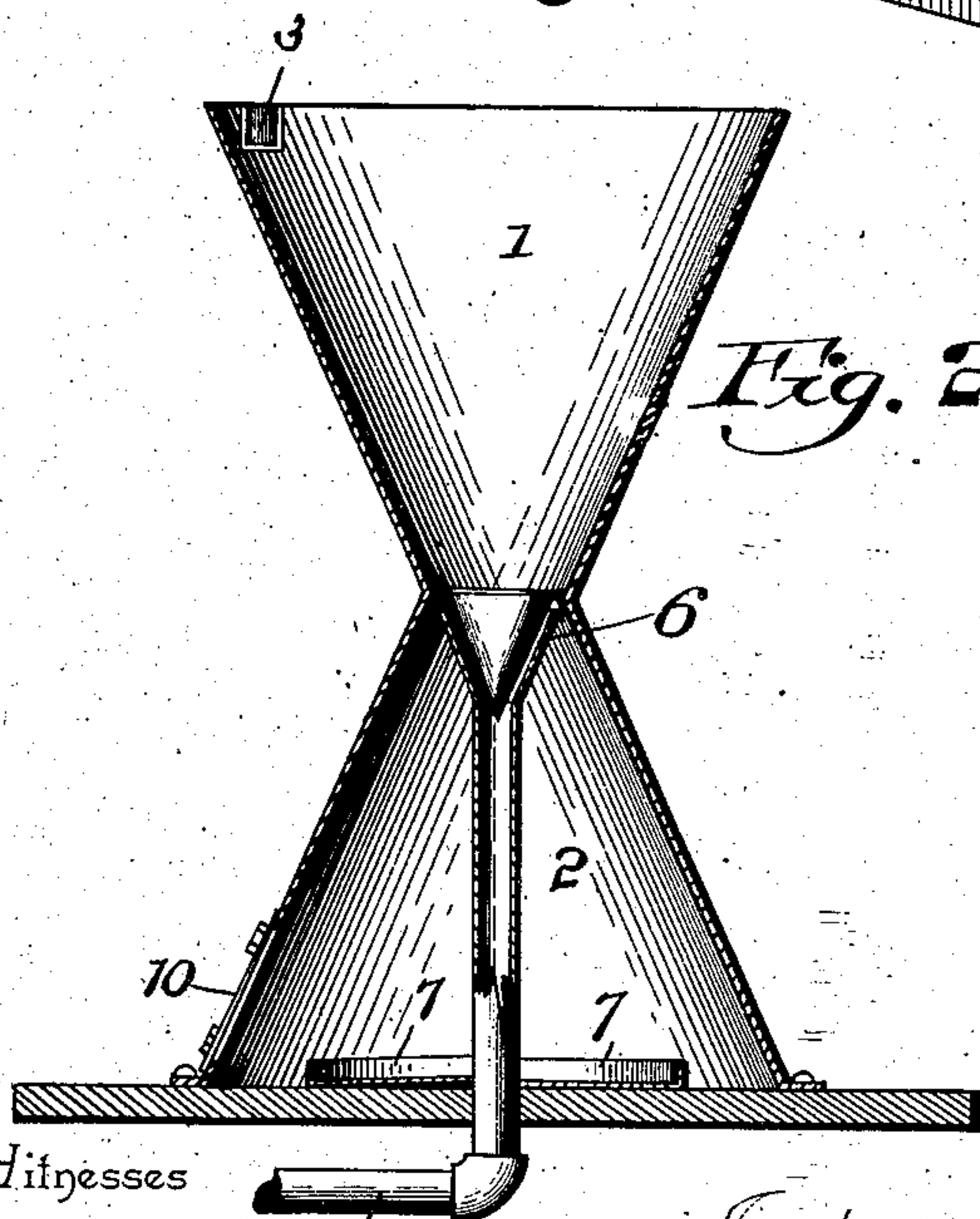
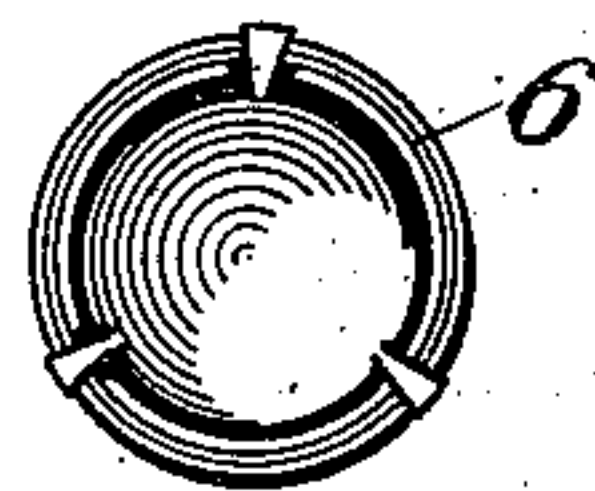
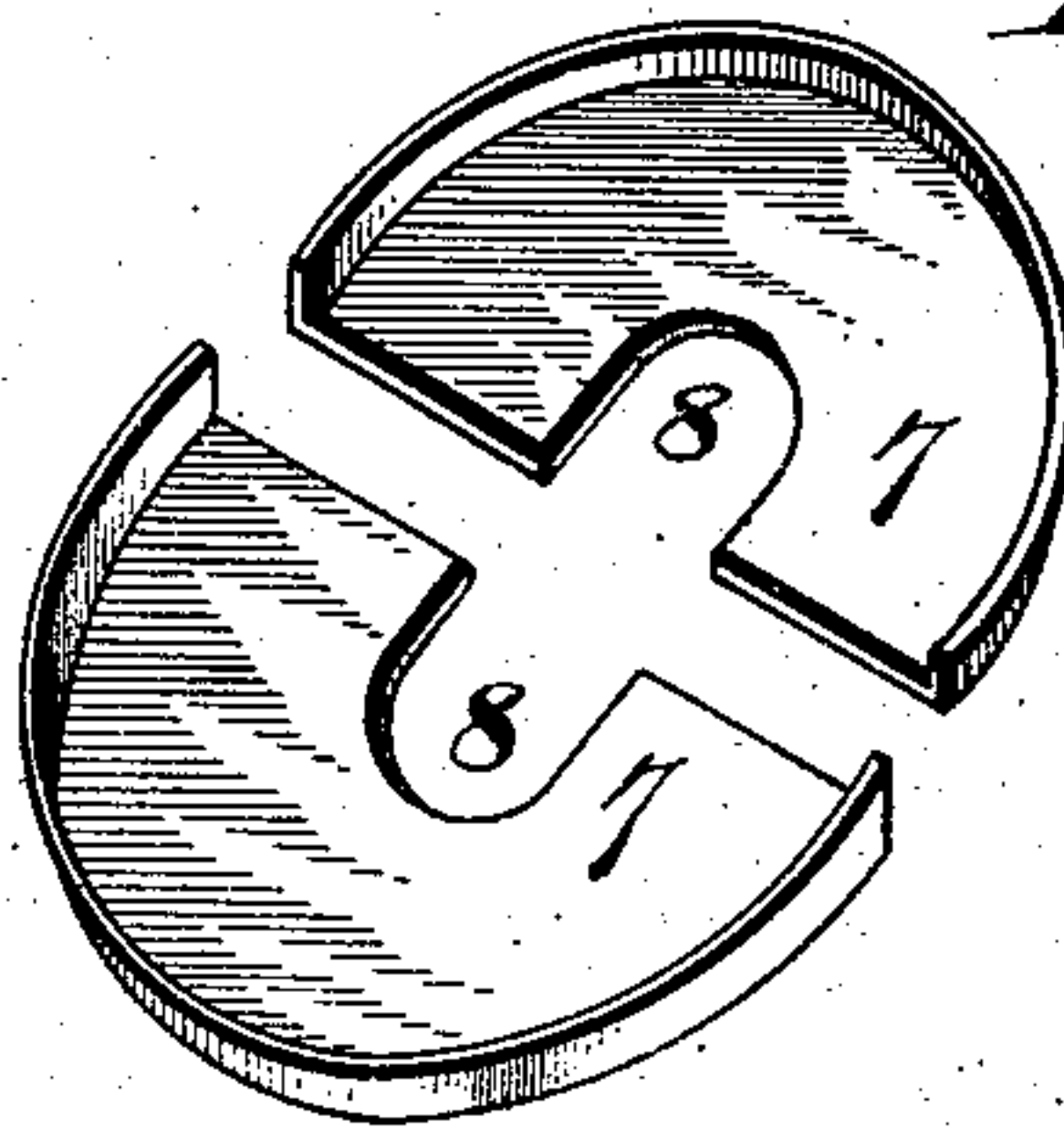


Fig. 2.

Fig. 3.



Witnesses

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UNITED STATES PATENT OFFICE.

ELMER MERRITT RICH, OF SILVERTON, COLORADO.

ORE-CONCENTRATOR.

SPECIFICATION forming part of Letters Patent No. 604,920, dated May 31, 1898.

Application filed June 8, 1897. Serial No. 639,886. (No model.)

To all whom it may concern:

Be it known that I, ELMER MERRITT RICH, a citizen of the United States, residing at Silver-
5 ton, in the county of San Juan and State of Colorado, have invented a new and useful Ore-Concentrator, of which the following is a specification.

The purpose of this invention is to extract and save all or practically the total amount
10 of the mineral contained in a given quantity of ore, so that the tailings are of little value and contain no appreciable amount of the precious metals.

A vital feature of the improvement is to
15 separate the precious metals from the baser mineral at one and the same operation and to carry off and float the sand and lighter particles.

In carrying out the intent of the invention
20 the ore to be separated, after being pulverized or otherwise prepared in the usual way, is introduced into a funnel-shaped receptacle and is given a whirling motion, whereby the mineral under the resultant force of centrifugal, gravital, and deflecting action moves to-
25 ward the center and gravitates, and is thereby separated from the mud, sand, and gravel; and the whirling and eddying mass of ore is subjected to an upward current of water,
30 whereby the sand and lighter particles are buoyed up and floated off, the mineral gravitating into a subreceptacle containing amalgamated trays, which absorb the precious metals, the baser mineral collecting in the sub-
35 receptacle, from which it is drawn at stated periods, thereby permitting the apparatus to be operated continuously.

For a full understanding of the merits and advantages of the invention reference is to be
40 had to the accompanying drawings and the following description.

The improvement is susceptible of various changes in the form, proportion, and the minor details of construction without depart-
45 ing from the principle or sacrificing any of the advantages thereof, and to a full disclosure of the invention an adaptation thereof is shown in the accompanying drawings, in which—

50 Figure 1 is a perspective view of an apparatus especially designed for carrying into effect the purpose of this invention. Fig. 2

is a vertical central section thereof. Fig. 3 is a detail view showing the tray for collect-
ing the precious metals. Fig. 4 is a top plan
55 view of the delivery end of the supply-pipe, showing the nozzle.

Corresponding and like parts are referred to in the following description and indicated in the several views of the drawings by the
60 same reference characters.

The receptacle 1 is of flaring construction, being conico-cylindrical in outline, and approximates the shape of a funnel and is placed
65 with its wider end uppermost to receive the ore to be concentrated. The subreceptacle 2 is the counterpart of the receptacle 1, but placed in a reverse order, with its larger end down and its smaller end uppermost and connected with the contracted end of the recep-
70 tacle 1, the two receptacles being secured together in any manner found most advantageous. Flumes 3 and 4 communicate tangentially with the upper end of the receptacle 1, so as to impart a whirling motion to the ore
75 supplied to the receptacle, whereby the separation is effected. One of these flumes may serve as the inlet and the other the outlet, or both may be utilized for supplying the ore to the receptacle, and in this case the water and
80 waste products will flow over the receptacle 1 and be received in a box in which the apparatus may be located.

A pipe 5 communicates with the lower portion of the apparatus and passes centrally
85 through the subreceptacle 2 and connects with a suitable source for supplying water to the apparatus under pressure. The upper end of the supply-pipe is provided with a flaring nozzle 6, which is located about in a plane
90 corresponding with the juncture of the two receptacles, the flare of the nozzle corresponding to the flare of the receptacle 1, whereby the sheet of water injected into the receptacle 1 is caused to follow close to the walls thereof,
95 so as to engage with the outer stratum or layer of the whirling mass in the receptacle 1 and carry off the sand, mud, and tailings. The mineral collecting at the center passes into the subreceptacle across the sheet of water
100 escaping from the nozzle 6, whereby the light matter is entirely removed therefrom.

The tray located upon the base of the subreceptacle or apparatus is composed of simi-

lar sections or parts 7, each being of semicircular form and having a notch 8 in its inner edge to receive the supply-pipe. This tray is constructed of copper and is composed of 5 sections in the manner set forth to admit of its being fitted about the supply-pipe 5, so that it can be removed from time to time for collecting the precious metals precipitated thereon. This tray is formed with a vertical 10 rim, which acts as a retarder to retain the metal collecting thereon. The upper surface of the tray is amalgamated or coated with quicksilver for the purpose of absorbing any precious metal coming in contact therewith. 15 The baser metals accumulate in the subreceptacle and are drawn off from time to time through an opening closed by a plug or gate 9. The tray is removed through an opening in the side of the subreceptacle closed by a 20 door 10, and access is had to the interior of the subreceptacle by means of the said door.

Having thus described the invention, what is claimed as new is—

1. An ore concentrator and separator comprising similarly-formed funnel-shaped receptacles inversely disposed and joined at 25 their smaller ends, the subreceptacle having openings in its sides closed by means of a plug and a door, flumes communicating tangentially with the upper end of the topmost 30 receptacle, a pipe for supplying water ex-

tending vertically through the subreceptacle and terminating in a flaring nozzle about in the plane of the juncture of the two receptacles, and a tray placed in the subreceptacle 35 and removable therefrom through the opening closed by the door, substantially as described.

2. An ore-concentrator constructed substantially as set forth, comprising funnel-shaped receptacles inversely disposed and 40 joined at their smaller ends, a flume communicating with the upper end of the upper receptacle and disposed tangentially so as to impart a whirling motion to the ore simultaneously with its delivery to the receptacle, a 45 supply-pipe passing vertically through the subreceptacle and terminating in a flaring nozzle about in the plane of the juncture of the two receptacles, and a sectional amalgamated tray composed of similar parts notched 50 in their meeting ends and located in the subreceptacle and fitted about the supply-pipe, substantially as set forth.

In testimony that I claim the foregoing as 55 my own I have hereto affixed my signature in the presence of two witnesses.

ELMER MERRITT RICH.

Witnesses:

WARREN A. FAY,
JOHN W. TURNER.