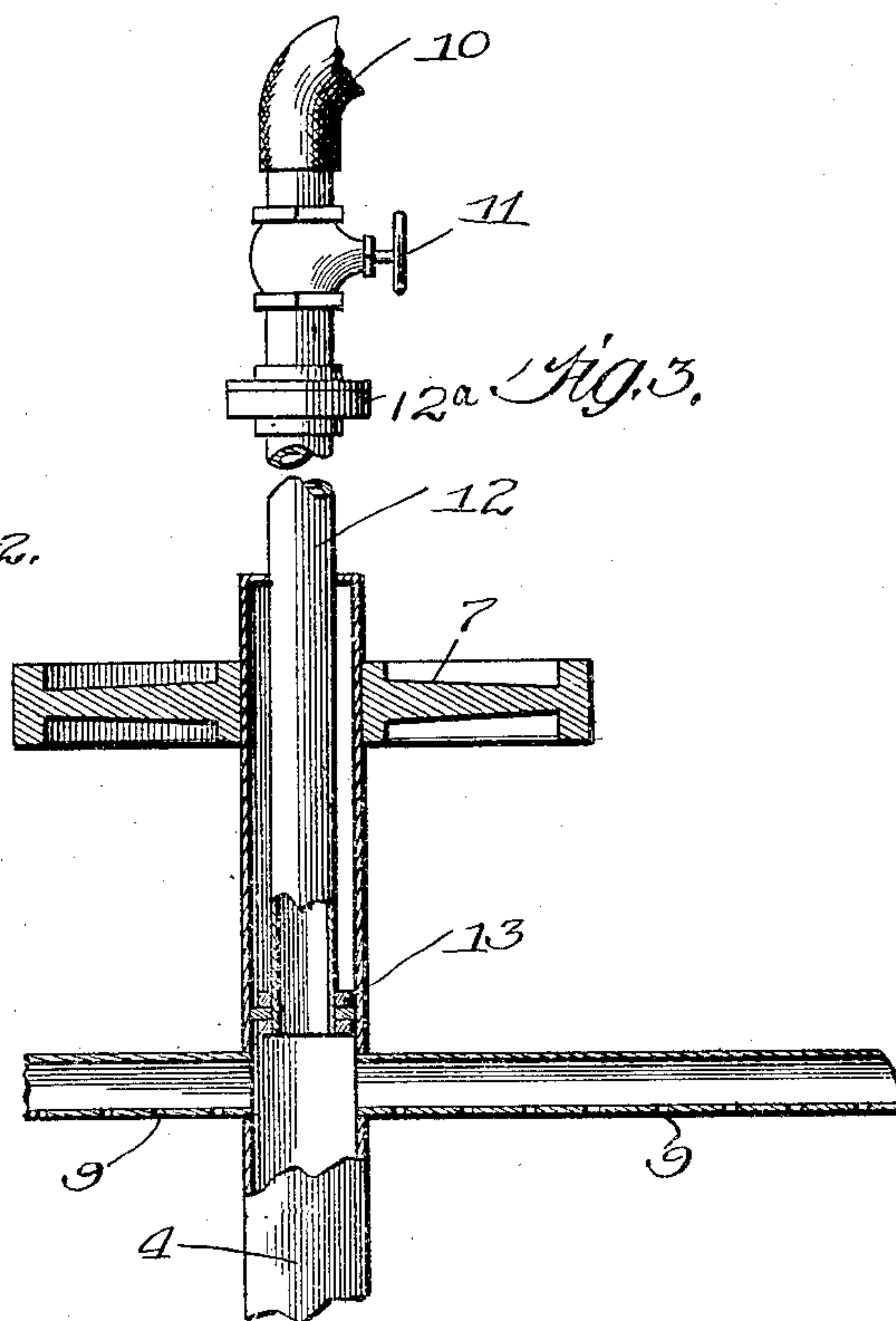
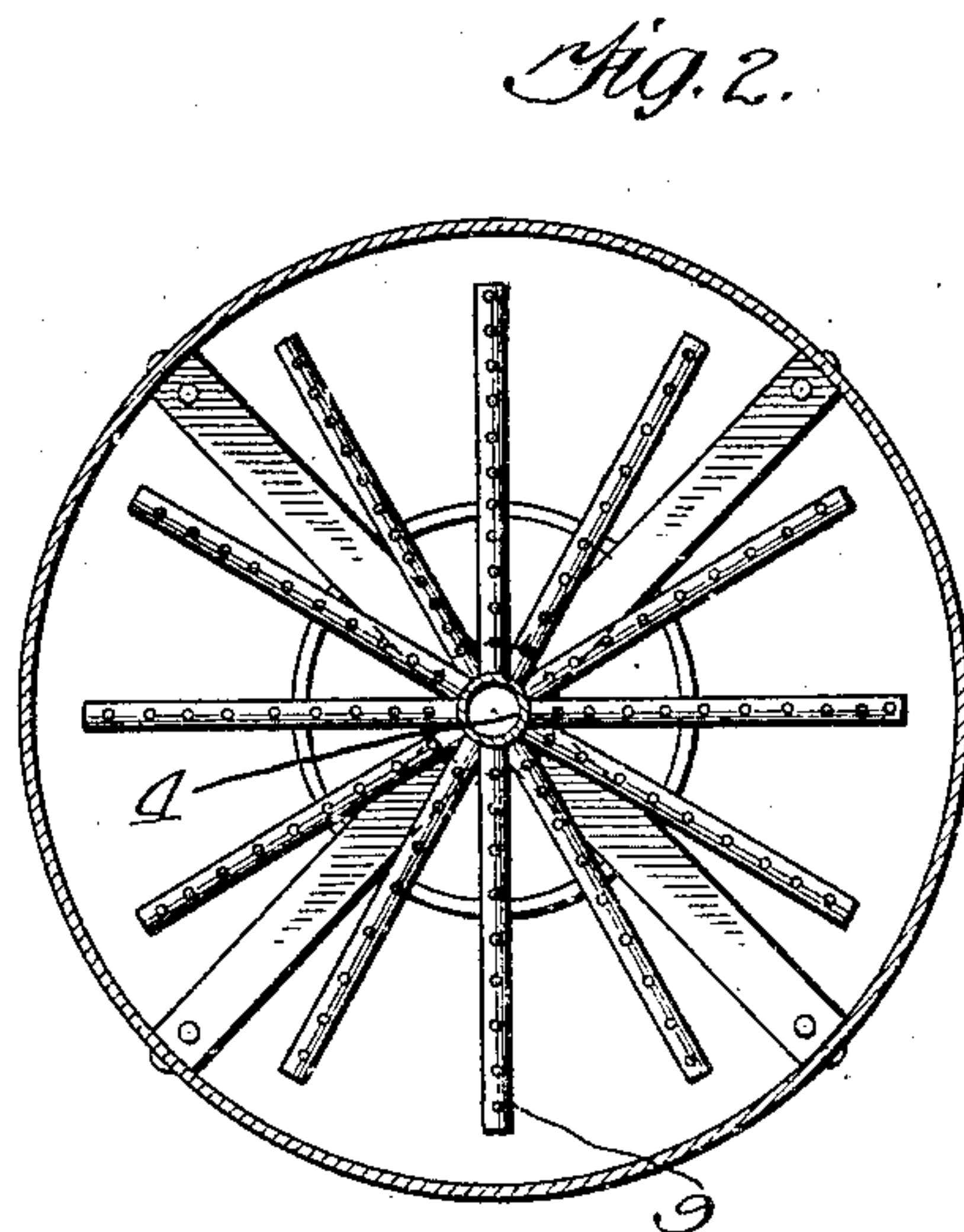
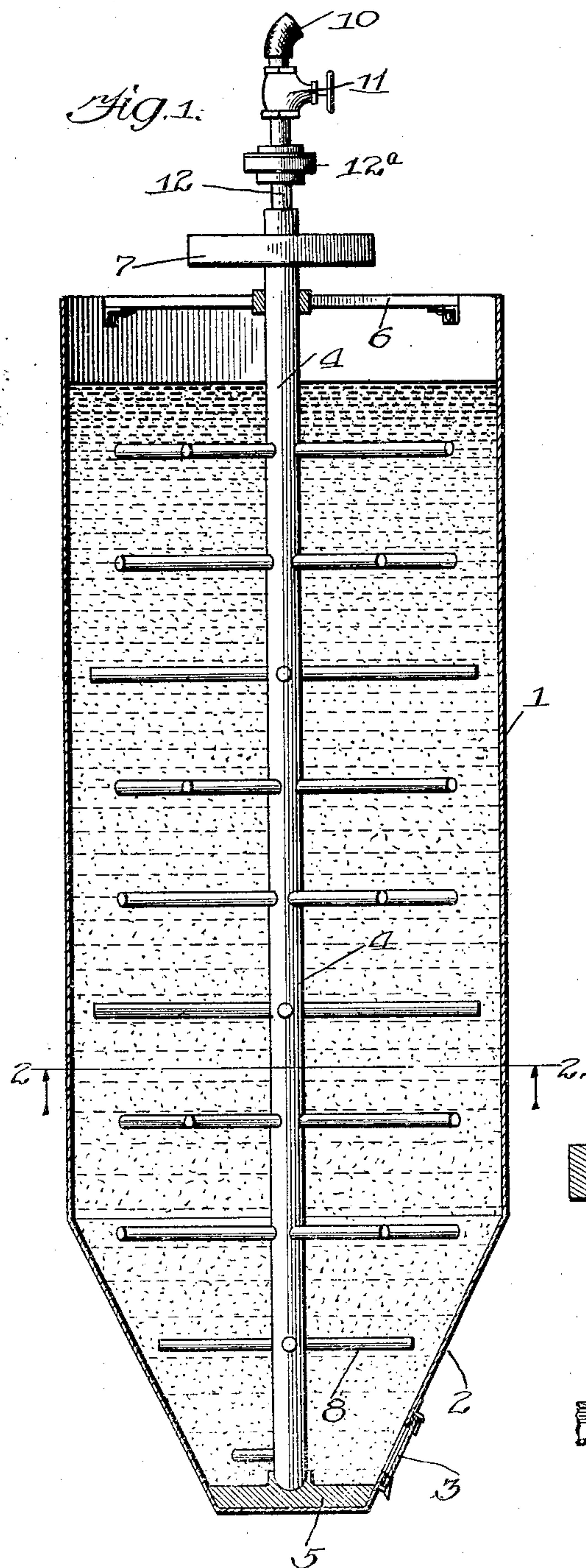


W. H. SILBERHORN.
ORE SEPARATING APPARATUS.
APPLICATION FILED MAR. 23, 1907.

931,153.

Patented Aug. 17, 1909.



Witnesses:
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attys

UNITED STATES PATENT OFFICE.

WILLIAM H. SILBERHORN, OF DUMONT, COLORADO.

ORE-SEPARATING APPARATUS.

No. 931,153.

Specification of Letters Patent.

Patented Aug. 17, 1909.

Application filed March 23, 1907. Serial No. 364,084.

To all whom it may concern:

Be it known that I, WILLIAM H. SILBERHORN, a citizen of the United States, residing at Dumont, in the county of Clear Creek and State of Colorado, have invented certain new and useful Improvements in Ore-Separating Apparatus, of which the following is a full, clear, and exact specification.

My invention relates more particularly to devices for agitating ore of the precious metals while undergoing treatment in those processes in which the ore is reduced to a state of fine subdivision and commingled with a separating solution, as, for example, in the cyanid process, and the invention has for its primary object to provide an improved, simple and efficient form of agitator which will not only keep the solution and the particles of ore in thorough agitation during the process, but will at the same time admit oxygen to the substance under treatment and bring into intimate association all particles of the metal-bearing ore and the active solution in the presence of a proper percentage of oxygen.

With a view to the attainment of these ends and the accomplishment of certain other objects which will hereinafter appear, the invention consists in certain features of novelty in the construction, combination and arrangement of parts which will now be described with reference to the accompanying drawings and more particularly pointed out in the claims.

In the said drawings;—Figure 1 is a vertical sectional view of my improved apparatus showing the internal parts in elevation. Fig. 2 is a cross-horizontal section looking upward from line 2—2 of Fig. 1. Fig. 3 is an enlarged detail sectional view hereinafter described.

In illustrating my invention, I have shown it as applied to or used in the cyanid process, in which the solution, together with the metal bearing ore or sand is placed in a tank or vat 1, which is preferably of cylindrical form and may be provided with a funnel shaped bottom 2, having a discharge door 3. In this form of the invention, the tank or vat 1 is of considerable height as compared with its width or diameter, so as to constitute a tall column of the solution and material to be treated.

Disposed centrally within the vat is a hollow shaft 4 which is stepped in a suitable bearing 5 at the bottom of the vat at its

lower end and is journaled in spider arms 6 at the top, where it is provided with means for causing its rotation, such as an ordinary pulley 7 which may be driven from any suitable source of power for causing the shaft 4 to rotate at the proper rate of speed. The lower end of the shaft is closed, but the shaft is provided throughout its height, or that portion of its extent which is submerged in the solution, with a plurality of laterally extending agitators or arms 8 which are in the form of tubes closed at their outer ends, but provided at suitable intervals throughout their lengths with jet orifices 9, and the upper end of the shaft is connected by pipe 10 having a globe valve or other suitable controlling means 11, with a source of air under pressure in such a way that the shaft 4 may be rotated freely while it remains in communication with such source of pressure. The arms 8 may be distributed or disposed throughout the circumference and height of the shaft 4 at any suitable intervals to suit the degree of agitation and extent of aeration required in the process, and it will be seen that while the shaft is under rotation, the arms will violently stir up the sand or particles of ore throughout the height of the column and the small jets of air discharged into the mass from top to bottom of the column will cause in addition to this agitation, a seething or boiling action due to the bubbles of air rising to the top of the solution, which will serve to carry the particles to the top of the column or keep them in suspension substantially during the entire time of the agitating action of the arms, thus bringing all particles of the metal-bearing ore or sand into intimate association with the solution and at the same time subjecting them to the action of the oxygen contained in the injected air.

The upper end of the shaft 4, where it connects with the pipe 10, is of course provided with some form of swivel joint that permits the shaft to rotate independently of the pipe, and in order that the discharge of air from the shaft 4 may be varied as desired throughout the height of the shaft, that is to say, may be caused to discharge from the lower arms in exclusion of the upper arms or agitators, the shaft is provided with means for closing the agitators at different levels. To this end the upper extremity of the shaft is closed and into the shaft is fitted a tube 12 which connects with the pipe 10 and which may be as long as the shaft 4 and capable of telescoping

therewith. On the lower end of the tube 12 is provided a packing 13 which prevents the air from escaping upwardly between the tube and the shaft. As a consequence, the
5 air admitted by the tube 12 will discharge from the shaft 4 through those arms 8 only which are below the packing 13.

The upper end of the pipe 12 may, if desired, be provided with a swivel connection
10 12^a with the nipple of the valve 11, to permit of the free rotation of the pipe 12 with the shaft 4.

In order that the invention might be understood by those skilled in the art, the details of an exemplification thereof have been
15 thus specifically described, but

What I claim as new and desire to secure by Letters Patent is:

1. In a device for agitating and aerating
20 ore while subjected to a dissolving solution the combination of a vat for containing the same, a hollow shaft journaled in the vat and provided with hollow agitating arms arranged at intervals throughout its height and
25 having a closed end and discharge apertures intermediate their ends and means for si-

multaneously admitting air under pressure to the shaft and rotating the shaft.

2. In a device for the purpose described the combination of a vat, a hollow shaft 30 journaled therein and provided with discharge outlets arranged at intervals throughout its height, means for admitting fluid under pressure to the shaft, means for shutting off said discharge outlets at will, and means 35 for rotating the shaft.

3. In a device for the purpose described the combination of a vat, a hollow rotary shaft journaled therein and having discharge outlets arranged at intervals throughout its 40 height, and an air supply pipe telescoped with said shaft and adjustable longitudinally with relation thereto.

In testimony whereof I have signed my name to this specification, in the presence of 45 two subscribing witnesses, on this 21st day of March A. D. 1907.

WILLIAM H. SILBERHORN.

Witnesses:

FRANCIS A. HOPKINS,
CHAS. H. SEEM.