

J. A. ERBSLOW.
 PROCESS FOR MAKING WHITE LEAD.
 APPLICATION FILED SEPT. 8, 1908.

930,057.

Patented Aug. 3, 1909.

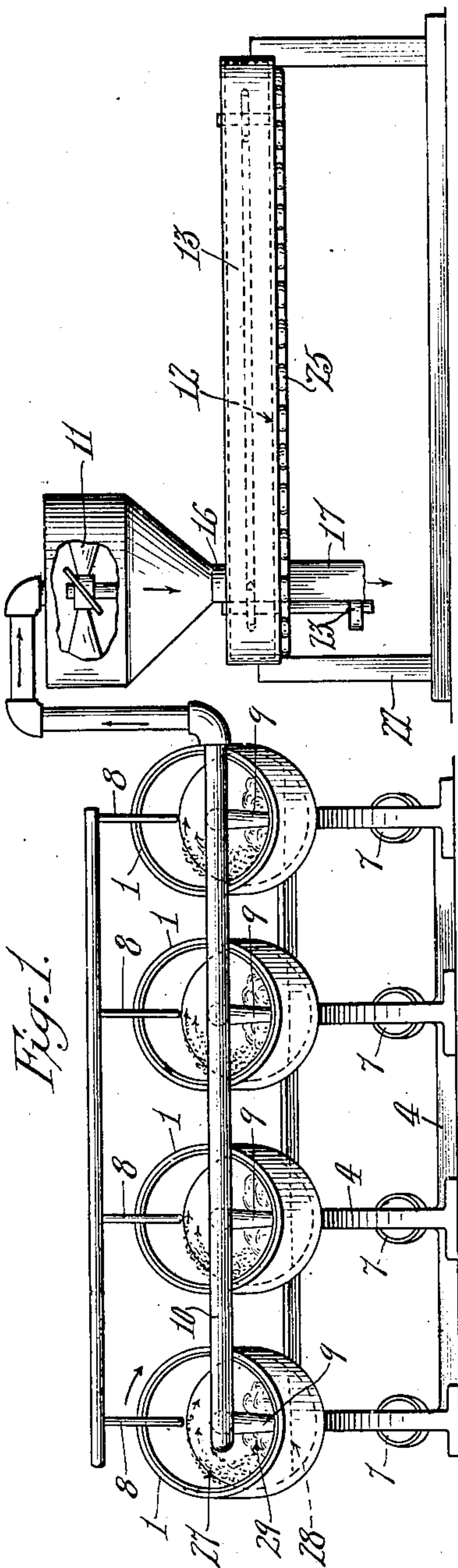


Fig. 1.

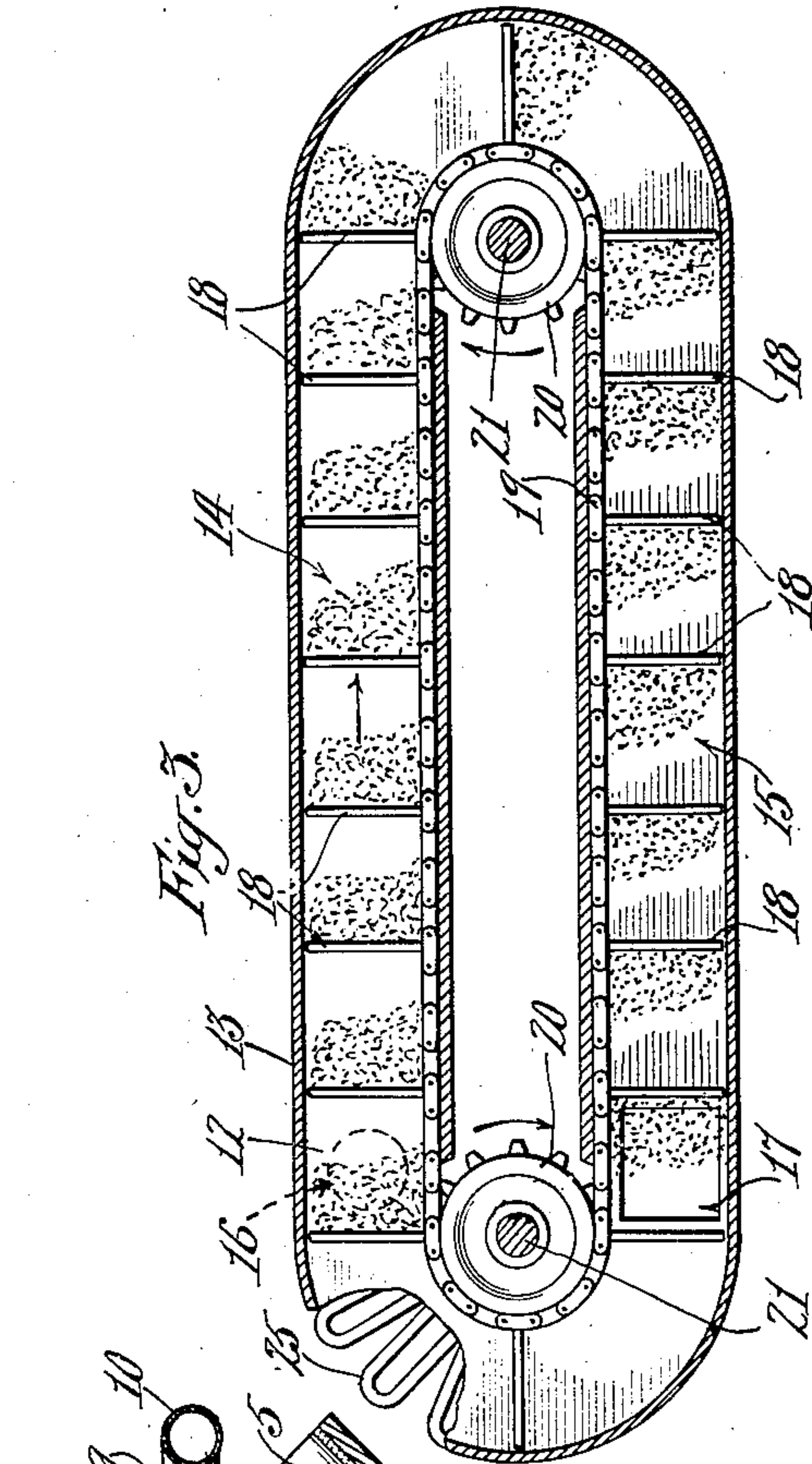


Fig. 3.

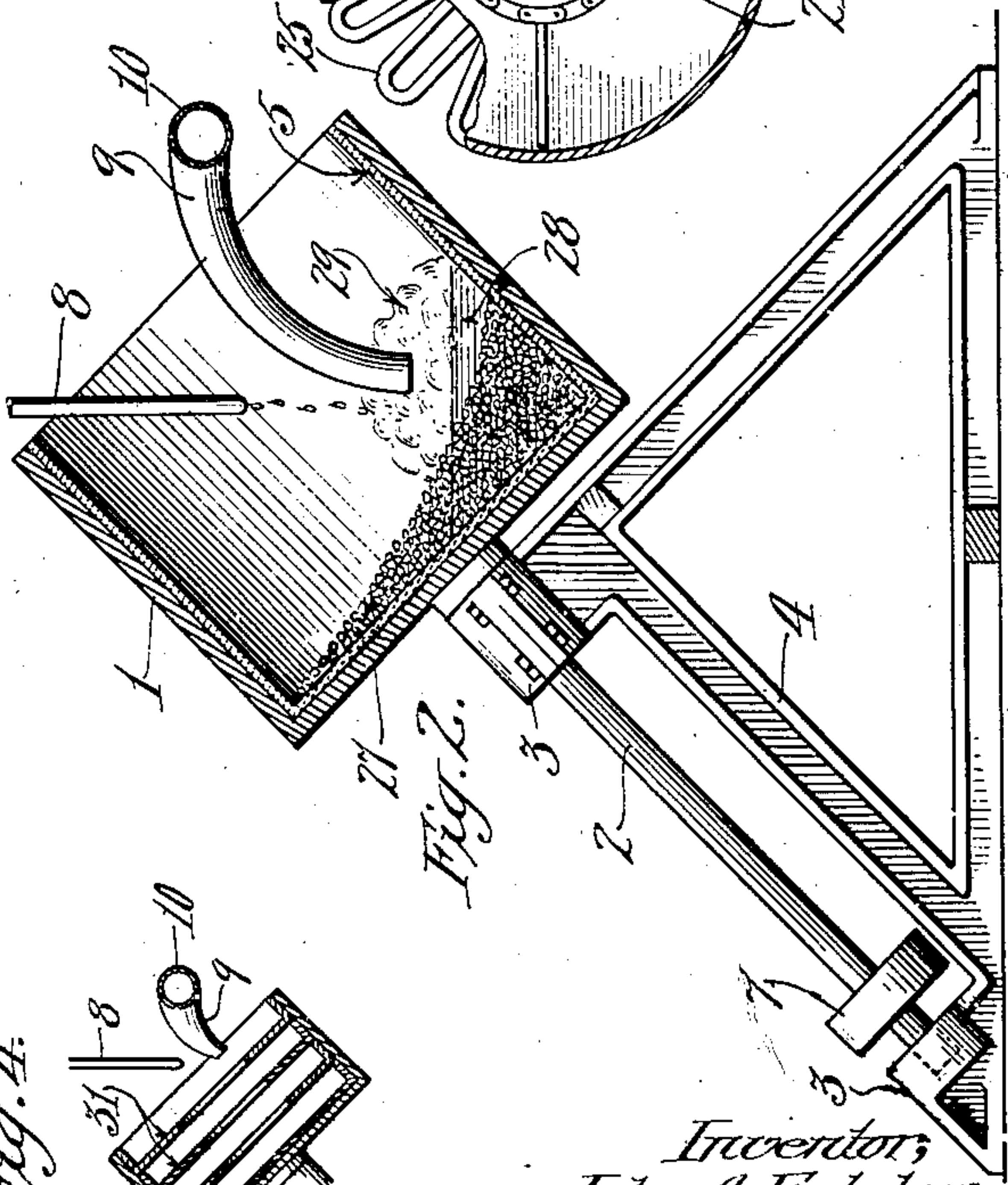
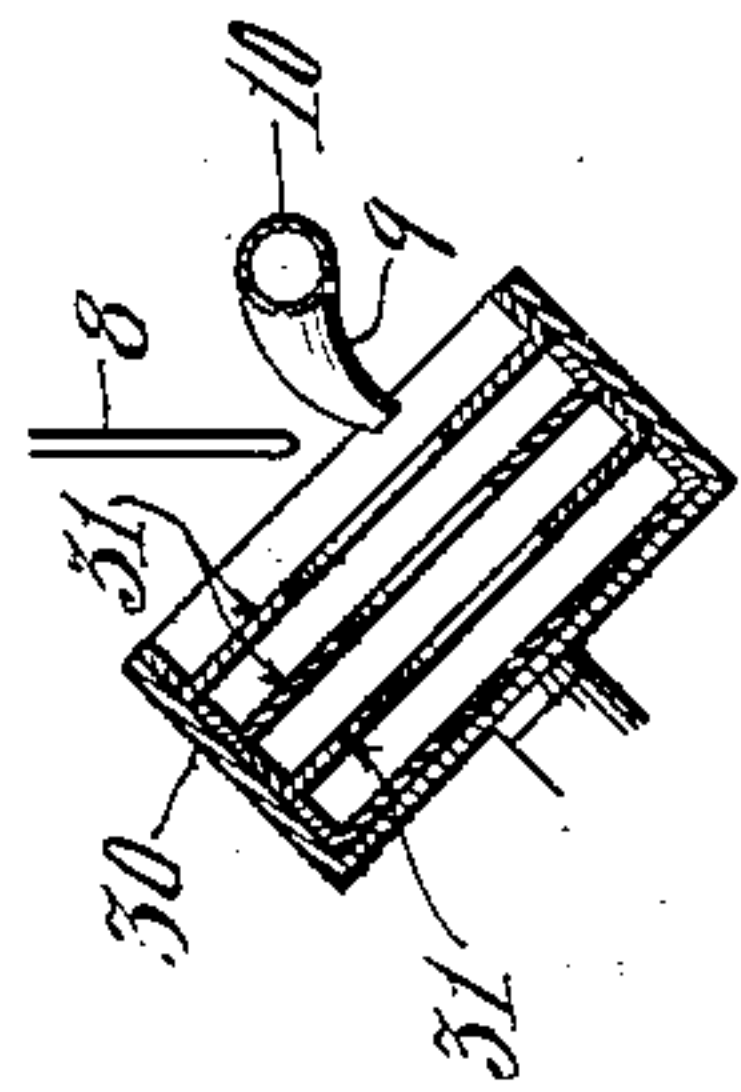


Fig. 2.

Fig. 4.



Witnesses:
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 Att'y

UNITED STATES PATENT OFFICE.

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PROCESS FOR MAKING WHITE LEAD.

No. 930,057.

Specification of Letters Patent.

Patented Aug. 3, 1909.

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To all whom it may concern:

Be it known that I, JOHN A. ERBSLOW, a citizen of the United States, residing at Los Angeles, in the county of Los Angeles and State of California, have invented a new and useful Process for Making White Lead, of which the following is a specification.

The main object of the present invention is to provide for the production of white lead in an economical and efficient manner.

Another object of the invention is to provide for the production of white lead of definite composition and quality.

The invention relates to the class of processes wherein the white lead is produced by attrition of lead in the presence of water and of oxidizing and carbonating agents, and an especial object of the invention is to provide for use of atmospheric air as an efficient agent for this purpose.

Another object of the invention in this connection is to provide for separation of the produced white lead free from contamination with impurities, such as finely divided lead.

The process consists essentially in tumbling or otherwise moving lead while in a more or less divided state to cause attrition thereof; causing the lead in such motion to pass alternately into contact with the body of water and with atmospheric air; thereby causing continual corrosion of the lead into hydrate and carbonate and attrition of the lead before or after corrosion; causing the lead in its movement from the atmospheric air into the body of water to carry air into said body of water thereby developing a foam consisting of white lead mixed with atmospheric air and water, drawing off said foam, and drying the foam.

The accompanying drawings illustrate an apparatus suitable for carrying out the process.

Figure 1 is a front elevation of the complete apparatus. Fig. 2 is a vertical section of the tumbling apparatus. Fig. 3 is a horizontal section of the drier. Fig. 4 is a vertical section showing a different form of tumbling apparatus.

The tumbling apparatus consists of a tub or vat 1 carried by a shaft 2 which is mounted to turn on suitable bearings 3 on a base 4, the shaft 2 being inclined so that the axis of the vat extends at an inclination to the hori-

zontal. Said vat may be of any suitable shape, for example cylindrical and may be lined with lead, as indicated at 5. The shaft 2 is provided with suitable grinding means, for example, a pulley 7 to receive power for rotating said shaft.

8 designates a pipe for supplying water to the vat, the vat being open at its upper end and the said pipe being located above the open end of the vat.

9 designates a suction pipe for drawing off the foam.

A plurality of the tumbling devices described above may be arranged in a series as shown in Fig. 1, a common suction pipe 10 being provided for the series, leading to a suction fan 11 which discharges onto a drying table 12 forming the bottom of a chamber 13. Said chamber is formed with two longitudinal compartments 14, 15 connected at their ends; the conduit from the suction fan discharging into one of said compartments at 16, see dotted lines in Fig. 3, and an outlet or discharge pipe 17 being provided from the other compartment. A scraper is provided consisting of a series of blades 18 on an endless chain 19, said endless chain being mounted on sprocket wheels 20 carried by vertical shafts 21 mounted in a frame 22, one of said vertical shafts having suitable driving means 23, whereby the chain may be made to continually scrape the material along the floor or table 12 from the inlet to the outlet of the drier. Heating means, for example steam coils 25, are provided to heat the table 12.

The process is carried out as follows: The lead is divided to a suitable condition of fineness, for example by melting and pouring into water to form slugs. The lead so divided is placed in the vat 1 and the shaft 2 being set in rotation, vat 1 is turned at such velocity as to cause the lead to be carried by the friction of the walls and the bottom of the vat upwardly at the rising side of the vat, the lead continually rising at one side and falling as it reaches or passes the mid plane of the vat, the motion and distribution of the lead being somewhat as indicated at 27 in Fig. 1. At the same time water is allowed to flow into the vat lead from the pipe 8, said water occupying the lowermost part of the vat, as indicated at 28. The motion of the vat is not sufficiently rapid to cause the

water to partake fully or materially in the circulatory or tumbling motion of the lead, the water remaining for the most part in a body at the bottom of the vat, thus the tumbling action of the lead as it rises at one side of the vat, carries it out of the water into the atmospheric air in the upper part of the vat and the further motion of the lead as it returns to the lower part of the vat carries it again into the body of water, thus the lead is alternately exposed to contact with water and with atmospheric air. Under these conditions a coating of hydrate and carbonate of lead is continually formed on the surface of each piece of lead and in the tumbling motion this coating is continually being ground away. As much of the lead as may be ground off from the pieces of lead before being corroded will eventually become corroded by the action of the atmospheric air as the particles of lead are exposed thereto.

The continual movement of the lead down into the water from the air, carries the air down into the water and thereby produces a foam 29 consisting of white lead, air and water, which rises to the surface in a bulky light mass. The suction pipe 9 aforesaid, being so located as to extend into this mass of foam, and suction being applied to this pipe, the foam is drawn therethrough and is conveyed by the suction to the drying table where it is dried by the heat supplied by the steam coils.

In the practical carrying out of the process it is found that the mud formed by attrition of the lead in this manner is more or less colored, presumably by the presence of uncorroded lead, being of a bluish color.

It is found that while the mud formed in the water is discolored as stated, the product existing in and produced from the foam is substantially pure white. It is obvious that the conditions for oxidation and carbonation in the foam are more favorable than they are in the body of water, and the corroded lead being lighter than the uncorroded lead, it is apparent that the foam will contain less uncorroded lead than the mud formed in the water. Aside from any explanation, however, that may be offered, the results of actual working of the process show that the product produced by drying the foam is substantially white and remains white after mixing with water or oil; whereas, the mud formed in the water does not become so white on drying and regains its dark color on moistening with water or oil. The said mud is therefore not suitable for use as white lead without further treatment; whereas the product of the dried foam is suitable for use as white lead without further treatment. No grinding is necessary as the product is a substantially impalpable powder.

The apparatus may be variously con-

structed, for example, as shown in Fig. 5 the vat, indicated at 30 may have a plurality of distributing rings 31 extending parallel to the bottom of the vat so as to present an increased frictional surface for lifting and tumbling the lead.

The process is preferably carried out in the presence of atmospheric air, which is found in quantities to furnish sufficient carbon dioxid, as well as oxygen, to form a mixture of carbonate and hydrate. If more carbonate is desired, carbon dioxide gas may be supplied by any suitable means.

What I claim is:—

1. The process of making white lead which consists in causing the lead in divided condition to move alternately into a body of water and into atmospheric air above the body of water, causing the pieces of lead in this motion to rub on one another, and in their descent from the air into the water, to carry air into the body of water to produce a foam containing white lead, drawing off said foam and drying the foam to obtain the white lead therefrom.

2. The process of making white lead which consists in causing the lead in divided condition to pass alternately into a body of water and of gas containing carbon dioxid and oxygen, to cause corrosion and attrition of the lead and to form a foam containing white lead, drawing off said foam and drying the foam to obtain white lead.

3. The process of making white lead which consists in causing the lead in divided condition to pass alternately into a body of water and of gas containing carbon dioxid and oxygen, to cause corrosion and attrition of the lead and to form a foam containing white lead, drawing off said foam by suction and drying the foam to obtain white lead.

4. The process of making white lead which consists in producing a foam by mechanical agitation of lead in the presence of water and air, separating said foam from the water and lead and drying said foam to obtain white lead.

5. The process which consists in tumbling lead in divided condition in the presence of water and air causing the formation of foam, allowing said foam to accumulate on top of the water, removing the accumulated foam, and drying the foam to form white lead.

6. The process of making white lead which consists in exposing lead in a divided condition to the action of water and air causing attrition of the lead to produce in connection with the water and the air a foam containing white lead, allowing said foam to accumulate on top of the water, removing the accumulated foam, and drying the foam to obtain white lead.

7. The process which consists in exposing lead in a divided condition to the action of

water and air, causing attrition of the lead to
produce in connection with the water and
air a foam containing white lead, removing
the foam from the water and lead by the
5 action of a current of air and drying said
foam.

In testimony whereof, I have hereunto

set my hand at Los Angeles, California, this
31st day of August, 1908.

JOHN A. ERBSLOW.

In presence of—

ARTHUR P. KNIGHT,
FRANK L. A. GRAHAM.