

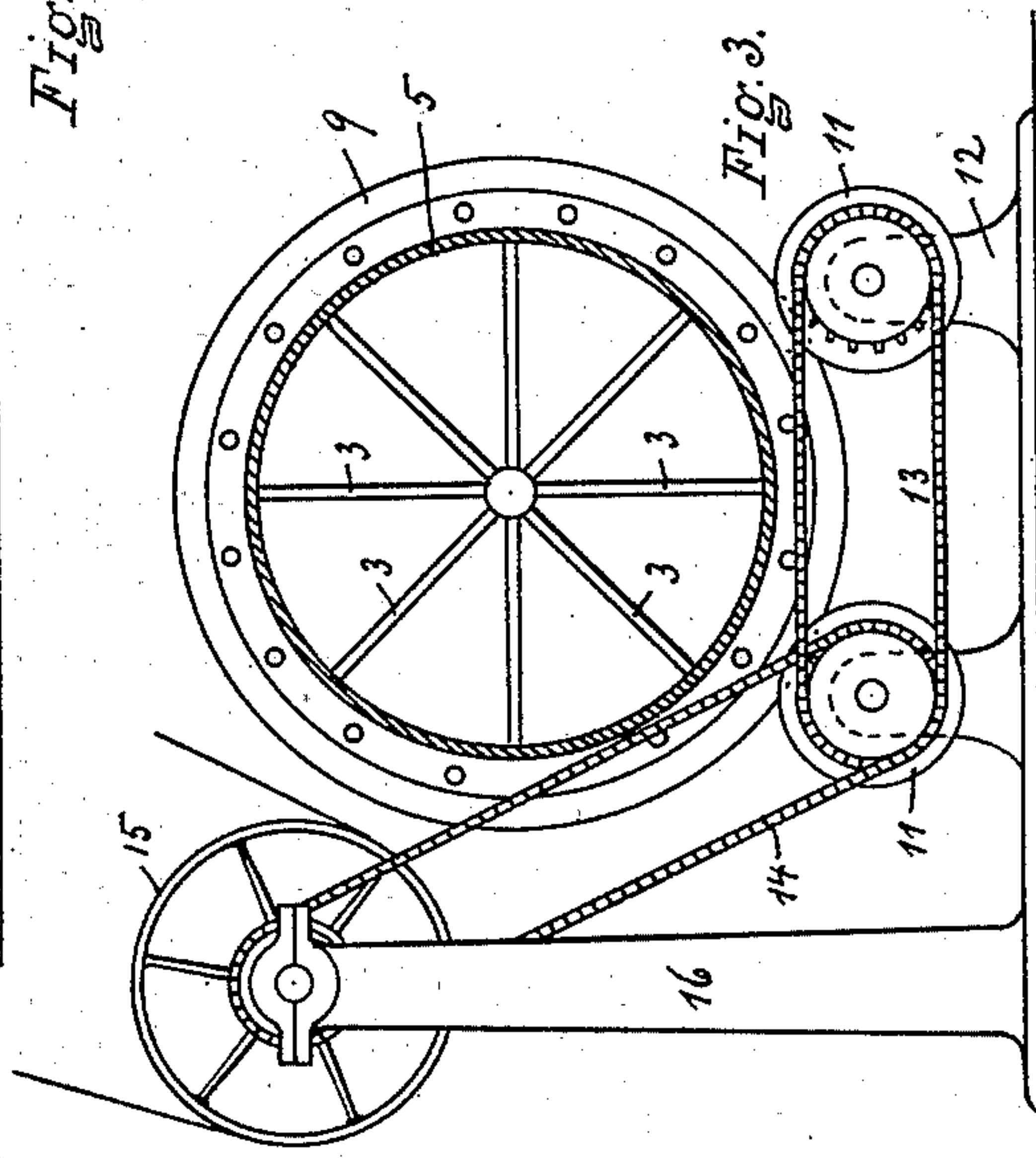
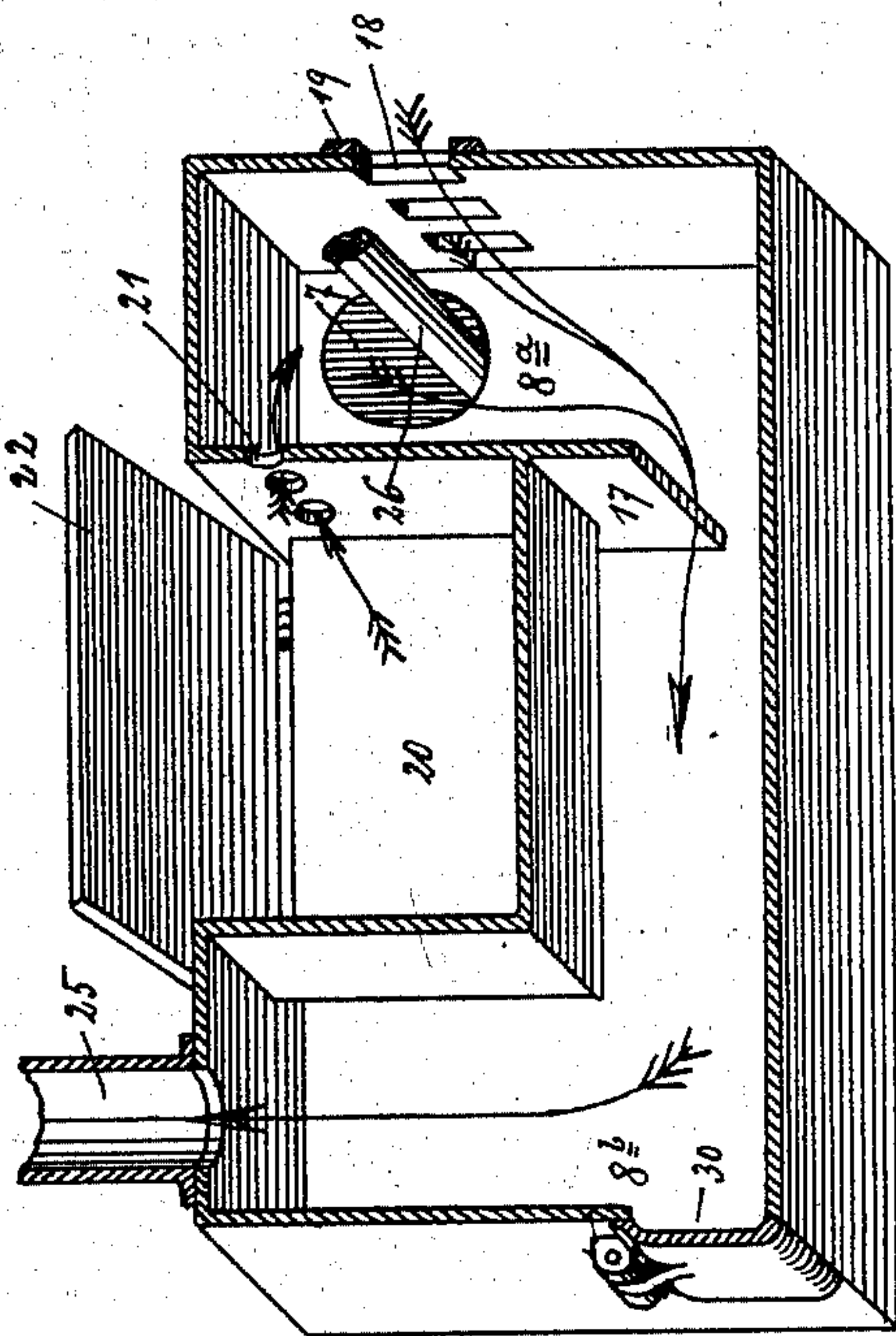
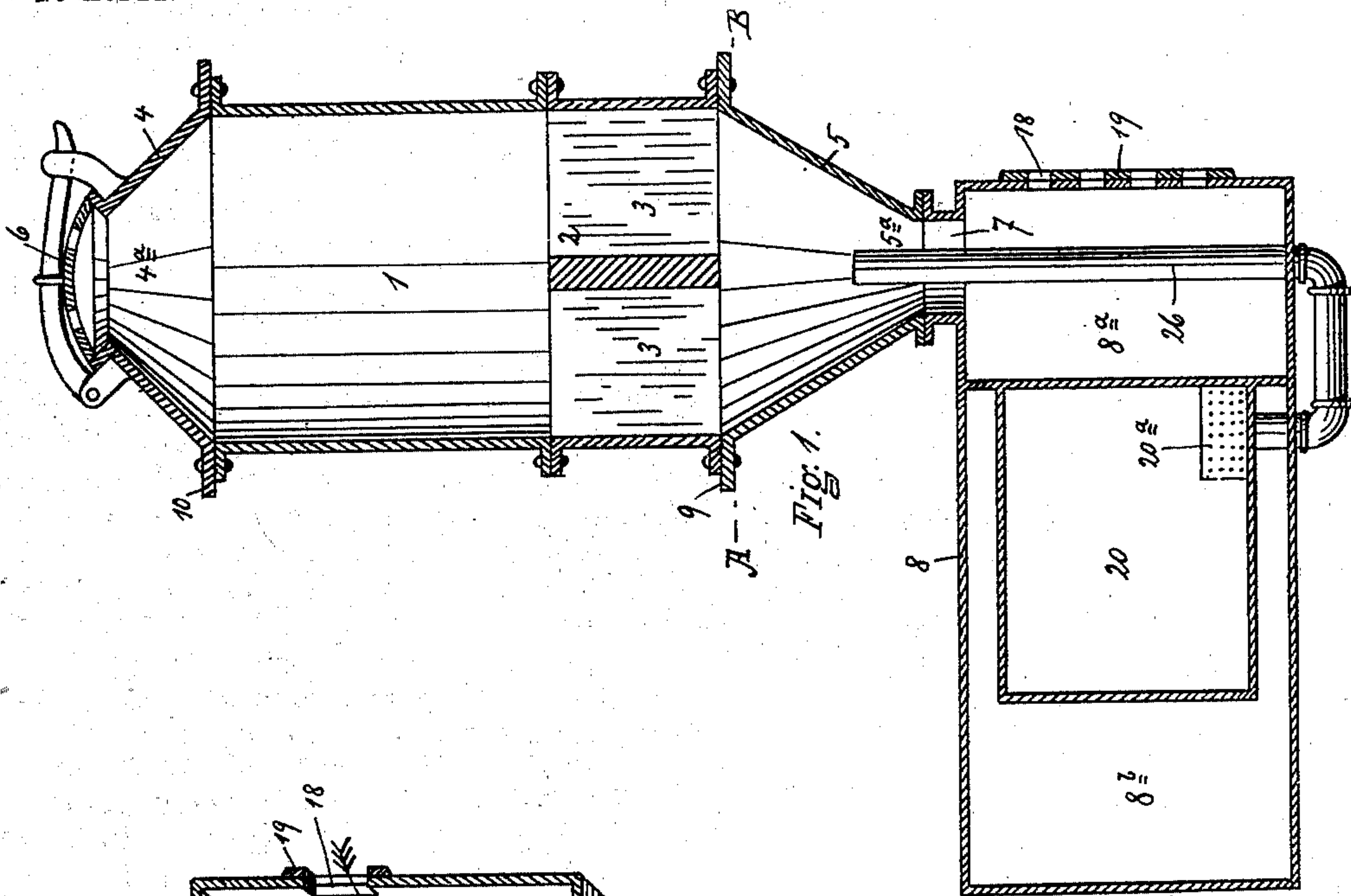
No. 749,311.

PATENTED JAN. 12, 1904.

J. A. MARSDEN.
APPARATUS FOR BURNING SULFUR.

APPLICATION FILED MAY 31, 1902.

NO MODEL.



WITNESSES
Rich. A. George
S. A. Brown.

INVENTOR
JOHN H. MARSDEN
BY *Milton C Robinson*
ATTORNEY.

UNITED STATES PATENT OFFICE.

JOHN A. MARSDEN, OF LYON FALLS, NEW YORK, ASSIGNOR TO A. R. PAUL, OF LYON FALLS, NEW YORK, AND ANDREW TROMBLEE, OF CARTHAGE, NEW YORK.

APPARATUS FOR BURNING SULFUR.

SPECIFICATION forming part of Letters Patent No. 749,311, dated January 12, 1904.

Application filed May 31, 1902. Serial No. 109,588. (No model.)

To all whom it may concern:

Be it known that I, JOHN A. MARSDEN, of Lyon Falls, in the county of Lewis and State of New York, have invented certain new and useful Improvements in Apparatus for Burning Sulfur; and I do hereby declare that the following is a full, clear, and exact description of the invention, which will enable others skilled in the art to which it appertains to make and use the same, reference being had to the accompanying drawings, and to the figures of reference marked thereon, which form part of this specification.

My present invention relates to improvements in apparatus for burning or oxidizing sulfur, particularly in the manufacture of sulfuric acid and other chemicals.

The object of my invention is to provide an apparatus which will economically and expeditiously burn or oxidize sulfur and in which when the apparatus is in full operation a substantially uniform quantity of gases may be produced, the process not being interfered with or hindered in or by charging the apparatus.

Figure 1 indicates a horizontal section of the working parts of my apparatus. Fig. 2 shows a vertical section of a stationary portion of the apparatus with the parts to the rear of the sectional line shown in perspective. Fig. 3 shows a section taken on line A B of Fig. 1 in connection with portions of the mechanism for rotating the retort.

Referring to the reference-figures in a more particular description, the rotatable retort consists of a portion 1, which is a plain cylinder internally and externally, and a portion 2, which is subdivided internally by walls or partitions 3, and the conical inlet end portion 4 and the conical discharge end portion 5. The ends 4 and 5 are provided with axial openings 4^a and 5^a. The former is provided with a door 6 or means for closing the opening and provided with inlet or draft openings for entrance of air for the purpose of oxidizing the sulfur. The opening 5^a in the retort coincides with and runs in close proximity to the opening 7 in the combined oxidizing and settling chamber 8. The retort is provided with circular

flanges or tracks 9 and 10, which run in grooved rollers 11, mounted upon shafts extending the length of the retort, which shafts are supported in the base 12. The shafts are connected by sprocket-wheels and sprocket-chain 13, so as to be made to travel at a uniform speed, and power is communicated to the shafts by means of the sprocket-chain 14, which is driven by a band-wheel 15, mounted on a standard 16. The chamber 8 is divided into receiving and oxidizing portion 8^a and settling portion 8^b by the dependent partition 17. There are provided air-inlet openings 18 into the chamber 8^a at or adjacent to the opening 7, and there may be provided a slide, as 19, for regulating the amount of air introduced at this point. In the upper portion of the chamber 8 there is provided a melting-tank 20, one end of which is preferably formed by the partition 17, and through the partition 17 at the upper edge there are provided openings 21, connecting the top of the melting-tank with the oxidizing-chamber 8^a.

22 is a cover for the melting-tank.

The gases are discharged from the apparatus through the pipe 25, to which some means for producing a suction will be attached, or it may be continued vertically to form practically a chimney.

In starting the apparatus a small or preliminary charge of raw sulfur or brimstone will be introduced through the opening 4^a into the retort while it is standing still. The main charging will be done into the melting-tank 20 when the cover 22 is open. The circulation so far as the gases are concerned will be from the opening 4^a toward the opening 5^a in the discharge end, thence into the oxidizing-chamber 8^a, thence under the lower end of the partition 17 into the settling-chamber 8^b, and thence out at the pipe 25. When the heat of the preliminary charge has become sufficient, it will heat up the apparatus and melt the sulfur in the melting-tank 20. The melted sulfur will flow out through the strainer 20^a and through the pipe 26 and be delivered into the discharge end of the retort sufficiently within the conical portion, so that it

will flow down into the lower side of the cylindrical retort. The rotary retort should be started at or about the time that the sulfur begins to flow from the melting-tank into the
 5 retort. In raw sulfur or brimstone there is a considerable quantity of volcanic dust which accumulates on the surface of the molten sulfur and prevents it burning or oxidizing with sufficient rapidity. The rotation of the cyl-
 10 inder, including the subdivided portion, serves to stir up and agitate the molten sulfur, the sulfur more or less adhering to the walls, including the division-walls, and being carried up into the air, where it burns off. In burn-
 15 ing off from the walls, which are not submerged into molten sulfur, the volcanic dust is released and comes under the influence of the current of air or gases passing through the retort and is carried or worked forward
 20 and out of the discharge end of the retort and ultimately settles on the bottom of the chamber 8, particularly the portion 8^b thereof, and may be removed from time to time through the clean-cut opening 30. As the gases pass
 25 into the chamber 8^a a fresh supply of air is admitted at the openings 18 sufficient to complete the burning or oxidation of the sulfur, particularly such portion as has not previously been oxidized. This causes quite a high de-
 30 gree of heat at this point, which is to some extent utilized in the melting of the charging sulfur in the tank 20. Whatever fumes arise from the melting sulfur in the tank 20 pass into the chamber 8 through the openings 21,
 35 where they also become oxidized and are thus utilized.

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

1. In a sulfur burning or oxidizing apparatus, a rotary cylindrical retort having reduced
 40 axial openings in the ends and divided as to a portion of the interior by longitudinal partitions which do not extend to either of said openings, substantially as set forth.

45 2. In a sulfur burning or oxidizing apparatus, a rotary cylindrical retort having axial

openings of smaller diameter than the diameter of the interior of the body of the retort, and forming as to the lower portion a chamber adapted to hold a fluid or molten mass,
 50 interior walls extending diametrically toward the axial line from the wall of the retort and extending longitudinally of the retort a portion of its length only and terminating short of the axial openings, substantially as set forth. 55

3. In a sulfur burning or oxidizing apparatus, the combination of a cylindrical retort having reduced axial openings for intake and outlet, an oxidizing-chamber at the discharge
 60 end of the retort, means for supplying air to said oxidizing-chamber adjacent to the discharge end of the retort, a melting-tank arranged in the oxidizing-chamber and utilizing the heat thereof and a pipe connecting the
 65 melting-chamber with and discharging into the retort through the axial outlet-opening, substantially as set forth.

4. In a sulfur-burning apparatus, the combination of a rotary retort having axial intake and outlet openings in its ends, a melting-tank
 70 and a pipe discharging from the melting-tank into the rotary retort and means for producing a combustion and circulation of gases within and through the retort, substantially as set forth. 75

5. The combination in a sulfur burning or oxidizing apparatus of a rotary retort having reduced axial openings in its ends, a receiving-chamber at the discharge end of the retort
 80 connected therewith, a melting-tank having a pipe discharging into the retort, and means for producing a circulation through the retort and the connecting-chamber, substantially as set forth.

In witness whereof I have affixed my signature, in presence of two witnesses, this 26th day of May, 1902. 85

JOHN A. MARSDEN.

Witnesses:

L. D. HILLIGASS,
 BERNARD REED.