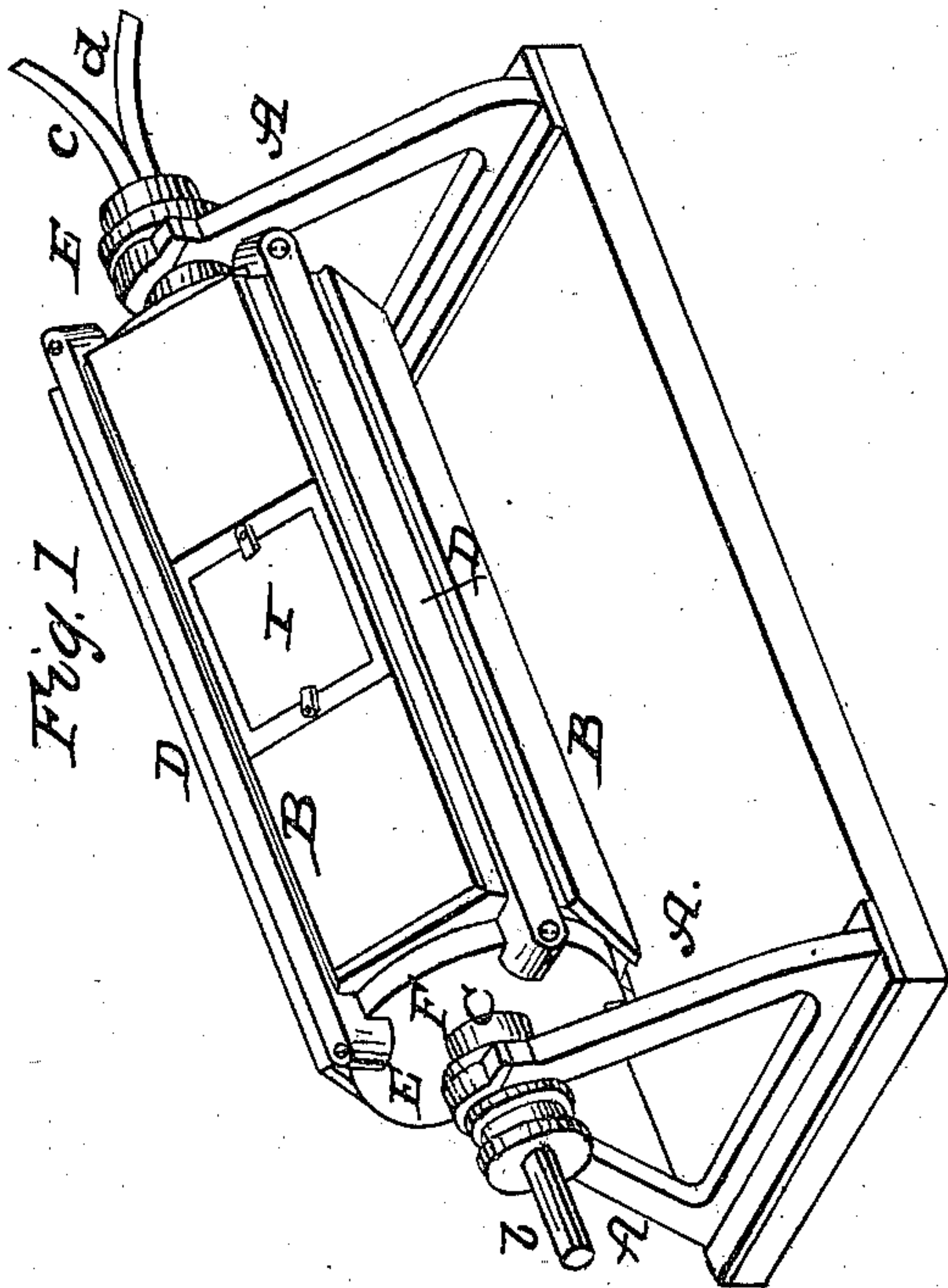
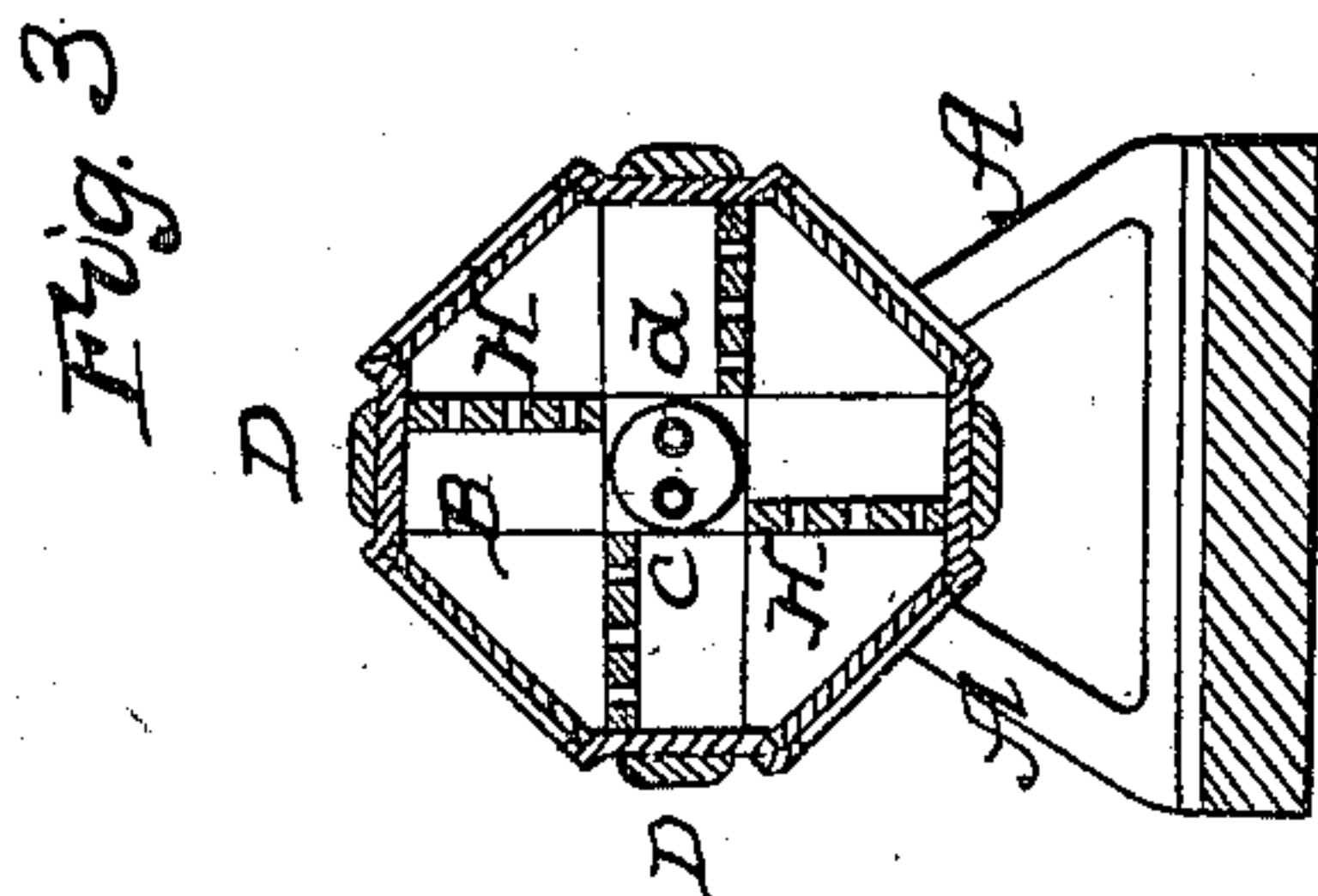
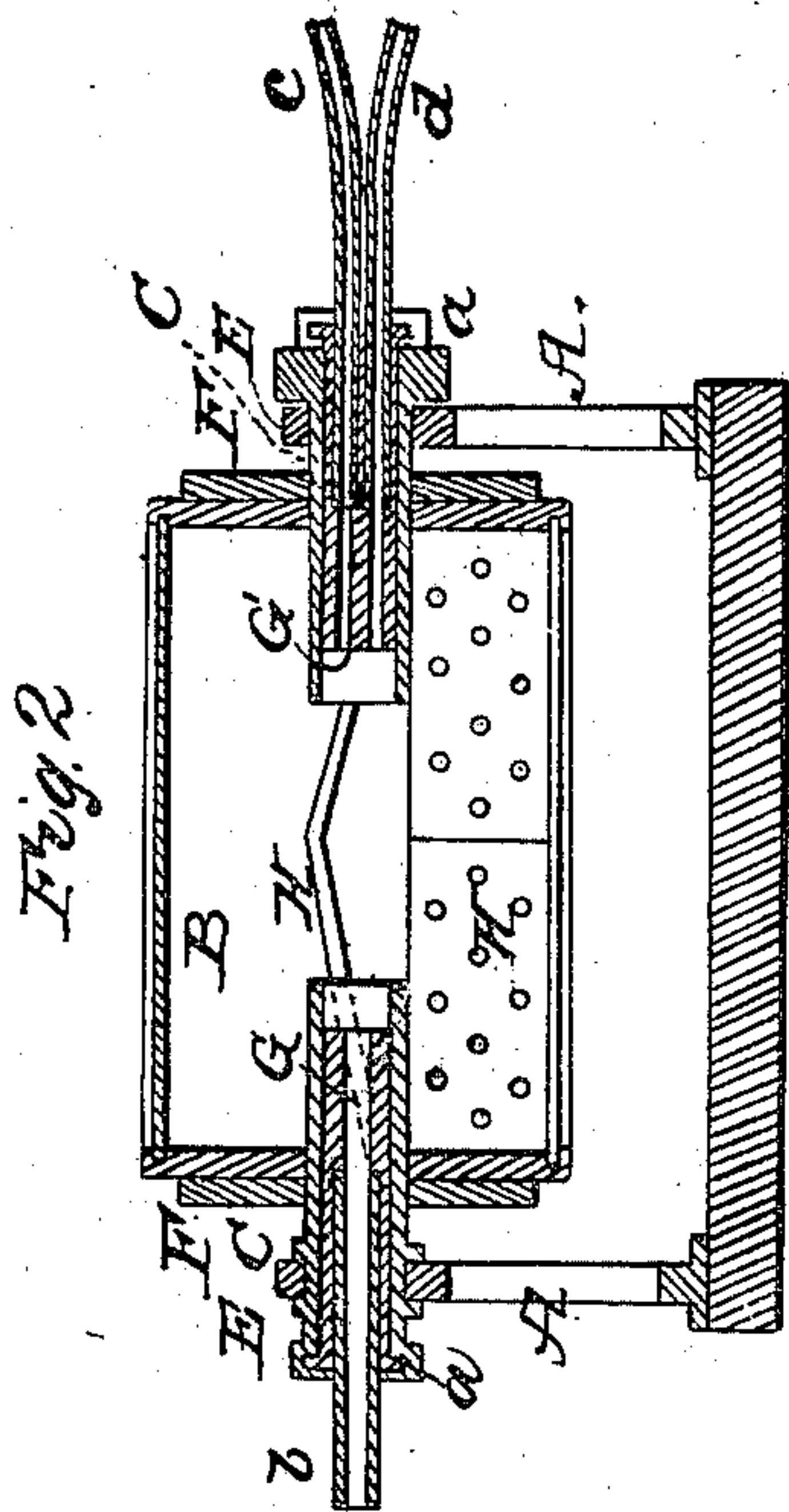


R. ROWLAND.
Manufacture of White Lead.

No. 42,407.

Patented April 19, 1864.



WITNESSES
James L. Lusk.
Julius Kirk.

INVENTOR.
Robert Rowland
by his attys
Luzner & Cohen

UNITED STATES PATENT OFFICE.

ROBERT ROWLAND, OF NEW YORK, N. Y.

IMPROVEMENT IN THE MANUFACTURE OF WHITE LEAD.

Specification forming part of Letters Patent No. 42,407, dated April 19, 1864.

To all whom it may concern:

Be it known that I, ROBERT ROWLAND, of the city, county, and State of New York, have invented certain new and useful Improvements in the Manufacture of White Lead; and I do hereby declare that the following is a full, clear, and exact description of the construction and operation of the same, reference being had to the accompanying drawings, in which—

Figure 1 represents a perspective view of an apparatus which I use in my process. Fig. 2 represents a longitudinal vertical section through the same. Fig. 3 represents a vertical cross-section through the apparatus.

My invention consists in converting granulated lead into white lead by subjecting it, while in a state of agitation within an air-tight compartment or receptacle, to the action of oxygen, acetic acid, and carbonic acid, thereby gaining great advantages, which will be set forth by the following description.

In the manufacture of white lead as heretofore practiced the lead, in sheets or proportionate large pieces, is exposed in a state of rest to the action of gases which convert it into white lead. It is placed upon grates or perforated bottoms within rooms or boxes, and when handled by the operatives they not only inhale the minute particles of white lead, but also some of the gases used in the manufacture, and those influences operate highly pernicious on their health. In that process the white lead formed on the lead has to be washed off and the remaining uncorroded metallic lead has to be remelted if it is to be used again in the manufacture of white lead. This entire manipulation is not only a very laborious one, taking up considerable time and labor, but it endangers the health of the operatives, and the remelting of the lead causes such a loss in the quantity of the material that it constitutes a large item in the manufacture of white lead. These difficulties and losses in time, labor, and material are obviated in my process. I use the lead in a granulated state, to which it can be reduced while cold by a suitable machine or any other process. The granulated lead is introduced into a revolving drum or barrel, which is closed air-tight, and into which I introduce the gases necessary to the corrosion.

The following apparatus may be used in this process, and I will describe it, as it will fully illustrate my invention.

I do not limit myself to an apparatus of any specific construction, as the construction may be modified in many points.

A represents the frame of the machine, to which the journal-boxes E are secured.

B represents a drum, which turns on its hollow trunnions C. This drum is composed of an iron frame, D, which is secured to the iron end plates, F, which support the wooden parts, the entire interior being made of wood, so that no part of lead or any gases used in the manufacture may come in contact with any metal parts of the apparatus. The sides of the drum may be made of glass, to admit the light into the interior, it having been found that light has a very important action in the corrosion of the lead; or the drum may be made entirely of wood. The trunnions or journals C are secured to the iron end plates, F, and the wooden pipes G are set within the journals C. They are provided with rims *a*, fitting within a suitable recess of the journals to prevent any longitudinal motion of the pipes G, and they are connected with pipes *b c d*, made of non-metallic substance, through which the gases necessary for the manufacture of white lead are introduced into the apparatus. The pipes G do not fit tightly within the journals C, and when the latter revolve with the drum the inner pipes, G, remain stationary. The latter extend sufficiently into the drum B so as to discharge the gases near its center and to cause their general diffusion through the apparatus.

H represents perforated shelves or partitions within the drum, which are intended to agitate the granulated lead so as to thoroughly expose it to the action of the gases. Each shelf consists of two inclined planes, which converge toward the center, each preceding shelf discharging the material onto the center of the succeeding one, whence by its gravitation it rolls toward the ends of the inclines, again returns to the center, and drops on the succeeding shelf.

The pipes *b c d* above described serve to introduce into the apparatus three different gases, which I use in the manufacture of white lead, viz: acetic acid, carbonic acid, and oxygen or ozone. Each of the pipes is provided with a valve or stop-cock to regulate the quantity of gas to be admitted, or to shut it off altogether. The action of oxygen is highly

energetic in accelerating the corrosion of the lead in combination with acetic acid and carbonic acid, and for this purpose I introduce a separate jet of oxygen, and I thereby not only accelerate the process, but I obtain a more perfect oxidation of the metal.

In the use of the granulated lead each grain presents a large surface to the action of the gases, which is also an important item in accelerating the corrosion of the metal, and the grain being small, each grain is corroded to the core, its entire texture is destroyed, and nothing of the metal remains which would require remelting, but the entire mass is converted into carbonate of lead.

Operation: The apparatus is kept in a room of a temperature of about 100° Fahrenheit, and lead, either granulated or reduced to a fine state, is introduced into the apparatus. A suitable quantity of granulated lead having been introduced into the apparatus, the action of the gases and of the light accelerates the corrosion. Owing to the increased surface of the lead in its granulated state, and to the action of the oxygen, the metal is converted into white lead. The slow rotation of the drum B continually exposes new surfaces of the metal to the action of the gases, detaches the white lead formed on the surface of the lead grains therefrom, and thus a minute fresh metallic surface is continuously corroded until the entire metal within the drum is acted upon. Should, after the conversion of the metallic lead into carbonate of lead, the latter contain acetate of lead, the said acetate of lead can be converted into carbonate of lead by shutting off the supply of acetic acid, and the carbonic acid and oxygen will readily convert it into carbonate of lead, which otherwise would

have to be separated and lost by washing, and I thus gain a high percentage in the product.

This apparatus perfectly protects the operative from inhaling any of the gases used in the manufacture of the article or the dust arising from the white lead—influences which are highly pernicious on the health of the operative. In removing the white lead from the drum, it may be moistened to prevent any dust from arising. The material is entered in and discharged from the apparatus through the door I. It will also be readily understood that by this process I produce an article of excellent quality, as it is protected against all impurities, and the supply of the gases necessary to produce the very best article can be adjusted with the greatest accuracy and no gases injurious to white lead can have access thereto.

Having thus fully described the nature of my invention, what I claim herein as new, and desire to secure by Letters Patent, is—

1. The manner herein described of converting granulated lead into white lead by subjecting it while in a state of agitation to the action of oxygen, acetic acid, and carbonic acid, substantially in the manner and for the purposes herein described.

2. Inducting the gases used in the carbonization of lead into a revolving drum by means of separate pipes or tubes provided with stop-cocks so that the supply of each of the gases can be regulated independently of the other, substantially in the manner and for the purpose herein described.

ROBERT ROWLAND.

Witnesses:

J. ADELBERG,
R. W. RAYMOND.