

No. 720,382.

PATENTED FEB. 10, 1903.

W. H. ROWLEY.  
APPARATUS FOR ATOMIZING METALS.

APPLICATION FILED SEPT. 9, 1902.

NO MODEL.

2 SHEETS—SHEET 1.

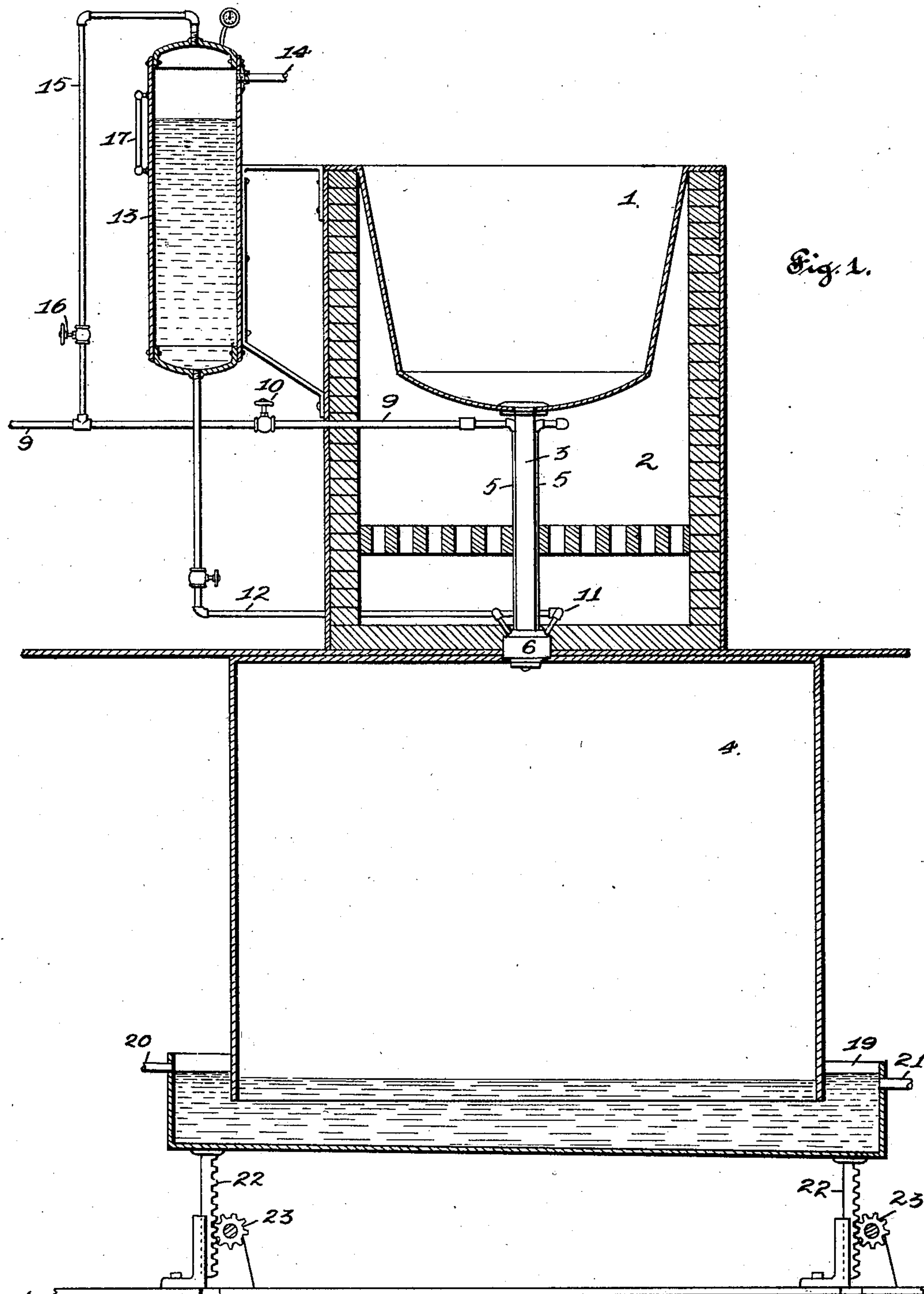


Fig. 1.

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by Higdon & Long an attys

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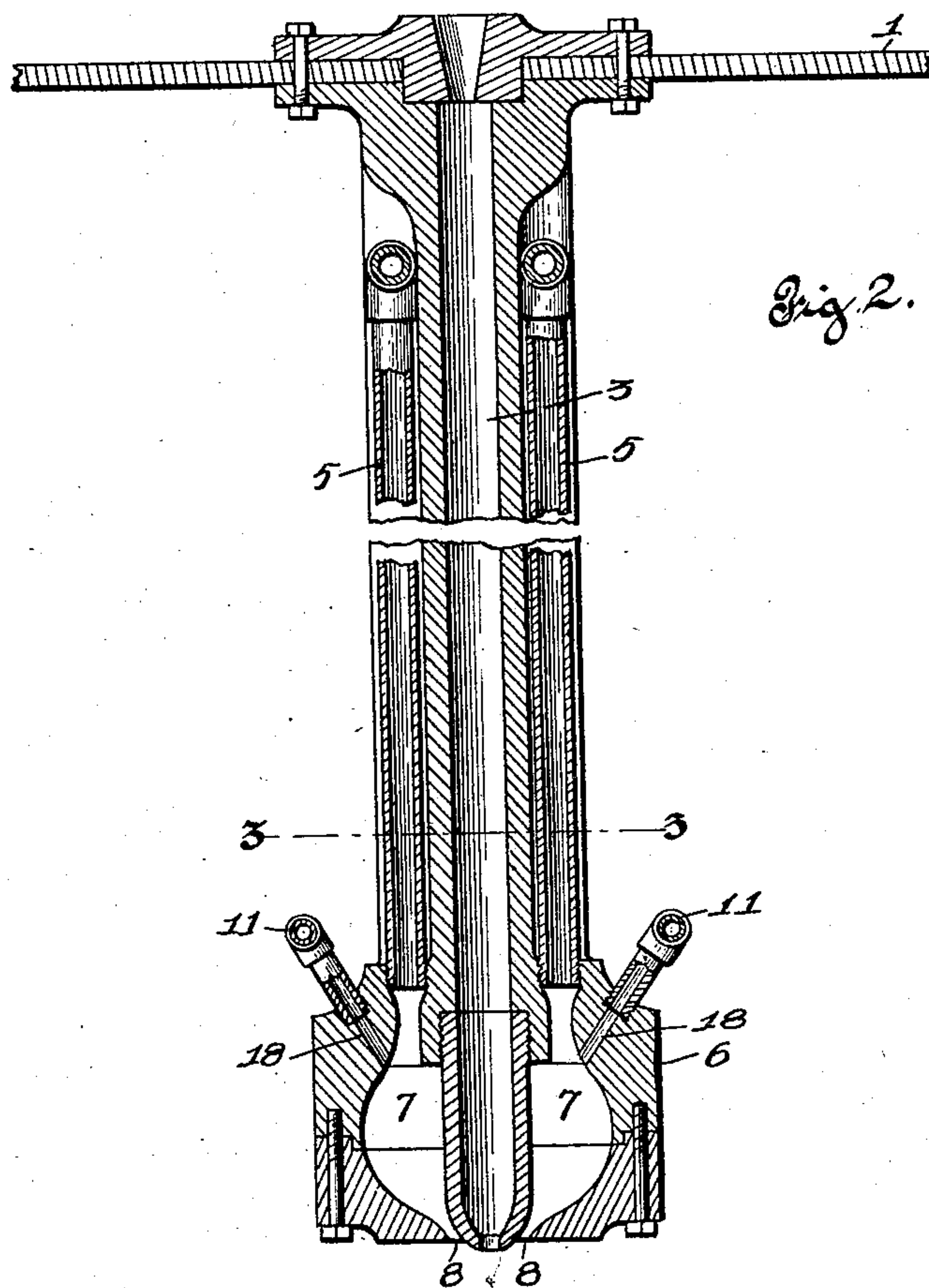


Fig. 2.

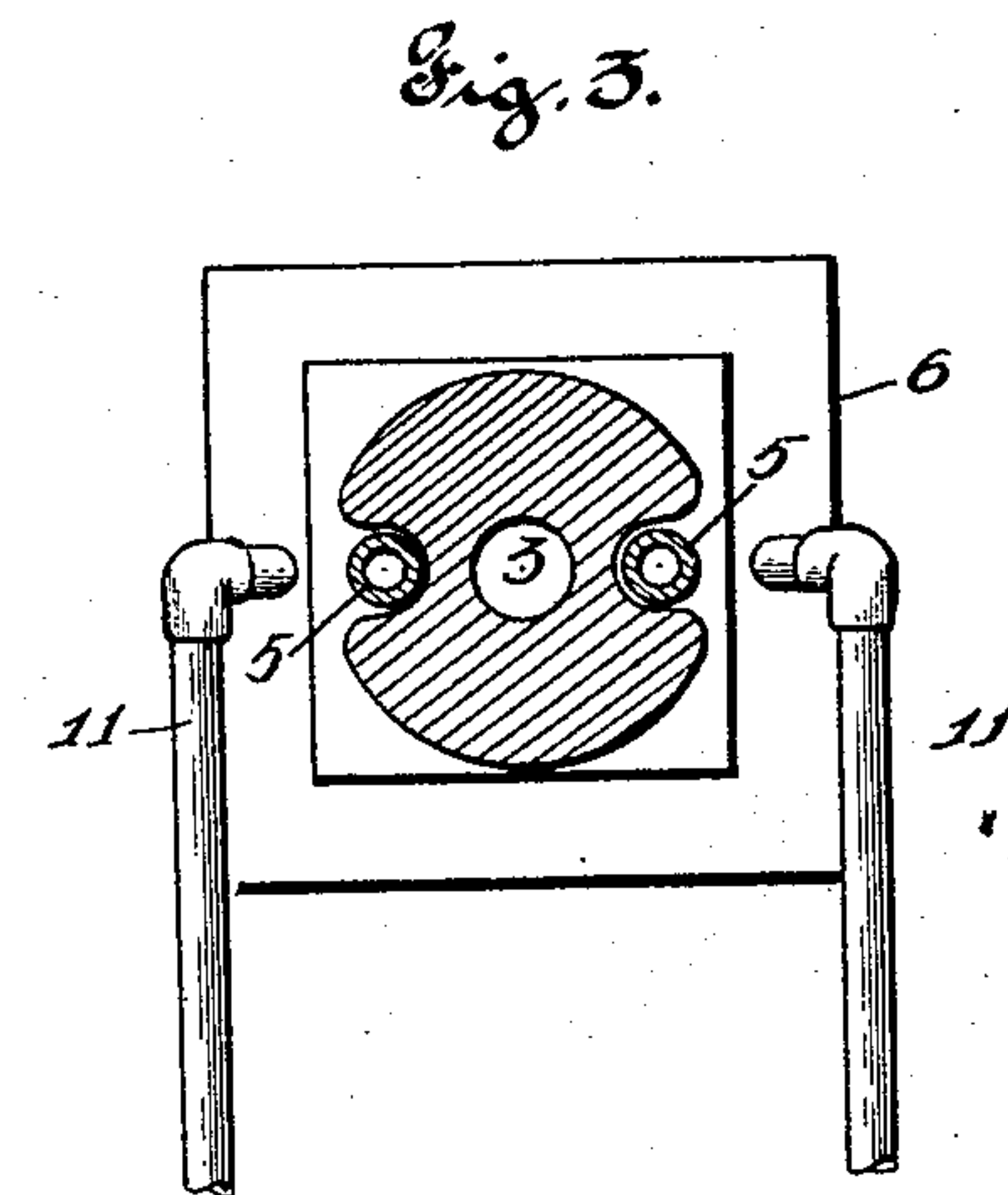


Fig. 3.

Witnesses  
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# UNITED STATES PATENT OFFICE.

WILLSON H. ROWLEY, OF ST. LOUIS, MISSOURI.

## APPARATUS FOR ATOMIZING METALS.

SPECIFICATION forming part of Letters Patent No. 720,382, dated February 10, 1903.

Application filed September 9, 1902. Serial No. 122,691. (No model.)

*To all whom it may concern:*

Be it known that I, WILLSON H. ROWLEY, of the city of St. Louis, State of Missouri, have invented certain new and useful Improve-  
5 ments in Apparatus for Atomizing Metals, of which the following is a full, clear, and exact description, reference being had to the accompanying drawings, forming a part hereof.

My invention relates to an improved apparatus for atomizing metals; and it consists of the novel construction, combination, and arrangements of parts hereinafter specified.

The object of my invention is to provide an improved apparatus of the class mentioned  
15 which shall simplify and reduce the cost of atomizing metals.

In the drawings, Figure 1 is a sectional elevation of an apparatus embodying my invention. Fig. 2 is a detail sectional view showing a part of the bottom of the melting-kettle with the atomizer attached thereto. Fig. 3 is a section on the line 3 3 of Fig. 2.

I will describe my invention in connection with atomizing lead; but it will be understood  
25 that it can be used in reducing other metals to a state of fine division.

Pure metallic lead is first melted in a kettle 1, heated by a furnace 2, and the lead is to be kept at a temperature sufficient to retain  
30 it in a liquid state and permit it to flow readily, and it is then run through a straight vertical pipe 3, which latter is made in the form of a heavy casting (attached at its upper end to the bottom of the said kettle) and discharged into  
35 the upper end of a suitable air-tight chamber 4, where the lead is atomized (according to a well-known principle) into a lead powder by coming into contact with steam, which is discharged into said chamber under high pressure  
40 by a series of vertical steam-pipes 5, arranged parallel with the pipe 3, and the lower ends of which are connected to an atomizer-head 6, in which is formed an annular recess 7, surrounding the lower portion of the said  
45 pipe 3. The lower end of the pipe 3 projects a slight distance below said head, so that as molten lead is discharged from the said pipe 3 the steam will issue from the annular recess 7 by way of an annular passage 8, surrounding the passage-aperture of said pipe,  
50 and in this manner the steam will mingle with the lead and atomize the same, as usual.

The steam-pipes 5 are supplied with steam by means of a suitable horizontal supply-pipe 9, which is provided with a valve 10. 55

The high-pressure steam discharged into the annular recess 7 may be moistened therein by the addition of water supplied by means of a series of water-pipes 11, which are connected to the water-supply pipe 12. Said water-pipe is preferably connected to the lower  
60 end of the water-tank 13 and water is supplied to said tank by means of the supply-pipe 14.

Steam is supplied to the top of the tank by means of the supply-pipe 15, which connects with the main supply-pipe 9, thereby providing the same pressure of steam and water to the annular recess 7, and the pipe 15 is controlled by the valve 16. The atomizer connecting with the kettle 1 is made of a heavy iron casting, so that it may store up and retain heat sufficient to keep the lead in a molten condition to its lowest extremity. The flow of the lead is controlled at the opening  
75 in the kettle by the usual plugs on the end of the iron bars. (Not shown.) The steam is superheated by passing through the pipes 5 and 9, running through the furnace.

17 indicates a glass water-gage for indicating the height of water in the said tank. 80

The lower end of the water-pipes 11 are screwed into the head 6 and communicate with the passages 18, arranged in said head at an angle with relation to each other. 85

By means of the atomizer above described the lead is atomized to a powdered state and carried along by the pressure of the steam and discharged forcibly into a basin of water 19 at the lower end of the said air-tight chamber 4 and where the lead is immediately covered by the water contained in said basin. The chamber 4 is preferably in the form of an inverted air-tight drum, with its lower end closed by the water contained within said  
95 basin 19 in a manner similar to that in which the lower end of an ordinary gas-receiver is closed. The basin 19 is continuously supplied with running water by means of suitable pipes 20 and 21. The water in the basin is thus kept comparatively cool by circulation. The steam under high pressure passes downward in the manner before stated and striking the cool water in the basin 19 is par- 100



tially condensed and continuously fills the chamber 4 with moisture, and the lead passing from the atomizer and coming in contact with the moistened steam where the same is discharged from the atomizer passes at high speed through the chamber 4, filled with moisture and devoid of air, and is not oxidized to any appreciable extent, it being speedily precipitated into the basin of water. The result will be powdered lead almost absolutely free from any oxidation. Thus the pig-lead is at practically one operation reduced to a perfectly-divided state, being metallic lead powder in water.

At the beginning of the operation the basin 19 is first slightly lowered until the lower end of the chamber 4 is clear of the water contained in said basin, and then moistened steam entering the said chamber will drive out the air previously contained therein, thereby replacing the air with steam and moisture, after which the basin is raised to its normal position, with the lower end of the said chamber 4 beneath the surface of the water contained in said basin, thereby making said chamber air-tight.

I claim—

1. An improved apparatus for atomizing metals, comprising the kettle 1 and the furnace 2, an atomizer connected to said kettle, means for supplying steam to said atomizer, and means for discharging water within the shell of the atomizer, substantially as specified.

2. An improved apparatus for atomizing metals comprising a kettle and furnace, an

atomizer connected to said kettle provided with a heavy iron casting containing the pipe 3 through which the molten metal is discharged, a shell 6 containing a chamber 7 surrounding said pipe, steam-pipes 5 discharging into said chamber, and a series of water-pipes 11 arranged to discharge water into said chamber, substantially as specified.

3. An improved apparatus for atomizing metals comprising a kettle and furnace, an atomizer connected to said kettle provided with a heavy iron casting, the pipe 3 through which the molten metal is discharged, a shell 6 containing a chamber 7 surrounding said pipe, steam - pipes 5 discharging into said chamber, a series of water-pipes 11 arranged to discharge into said chamber, and a water-tank located adjacent said furnace and connected to said steam and water pipes, substantially as specified.

4. An improved apparatus for atomizing metals, comprising an atomizer arranged to discharge molten metals downwardly through a chamber from which the air is excluded, the lower end of said chamber being open, a water-basin below said lower end of the chamber for receiving the particles of metal, and means for raising and lowering the said water-basin, substantially as specified.

In testimony whereof I affix my signature in presence of two witnesses.

WILLSON H. ROWLEY.

Witnesses:

ALFRED A. EICKS,  
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