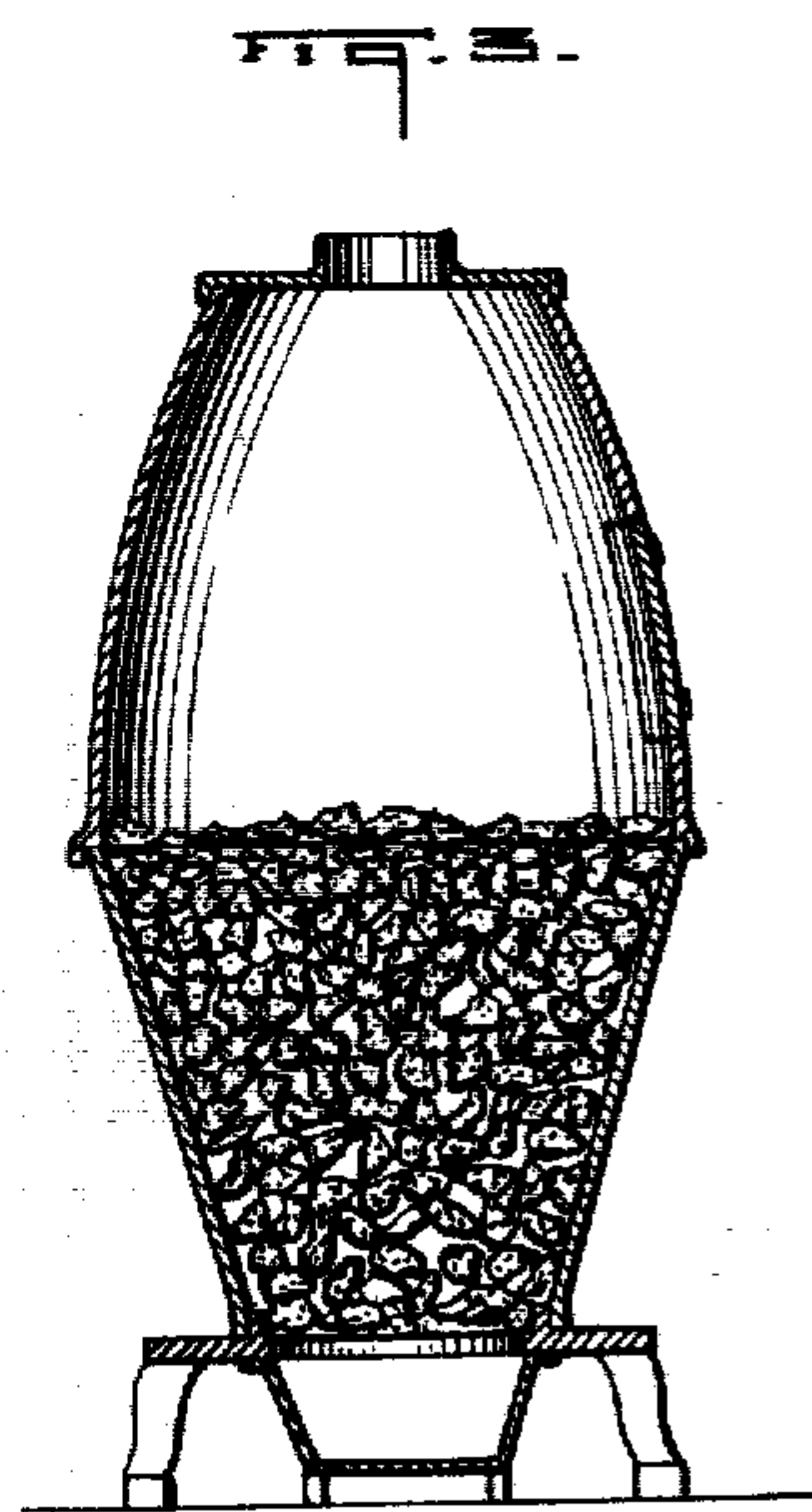
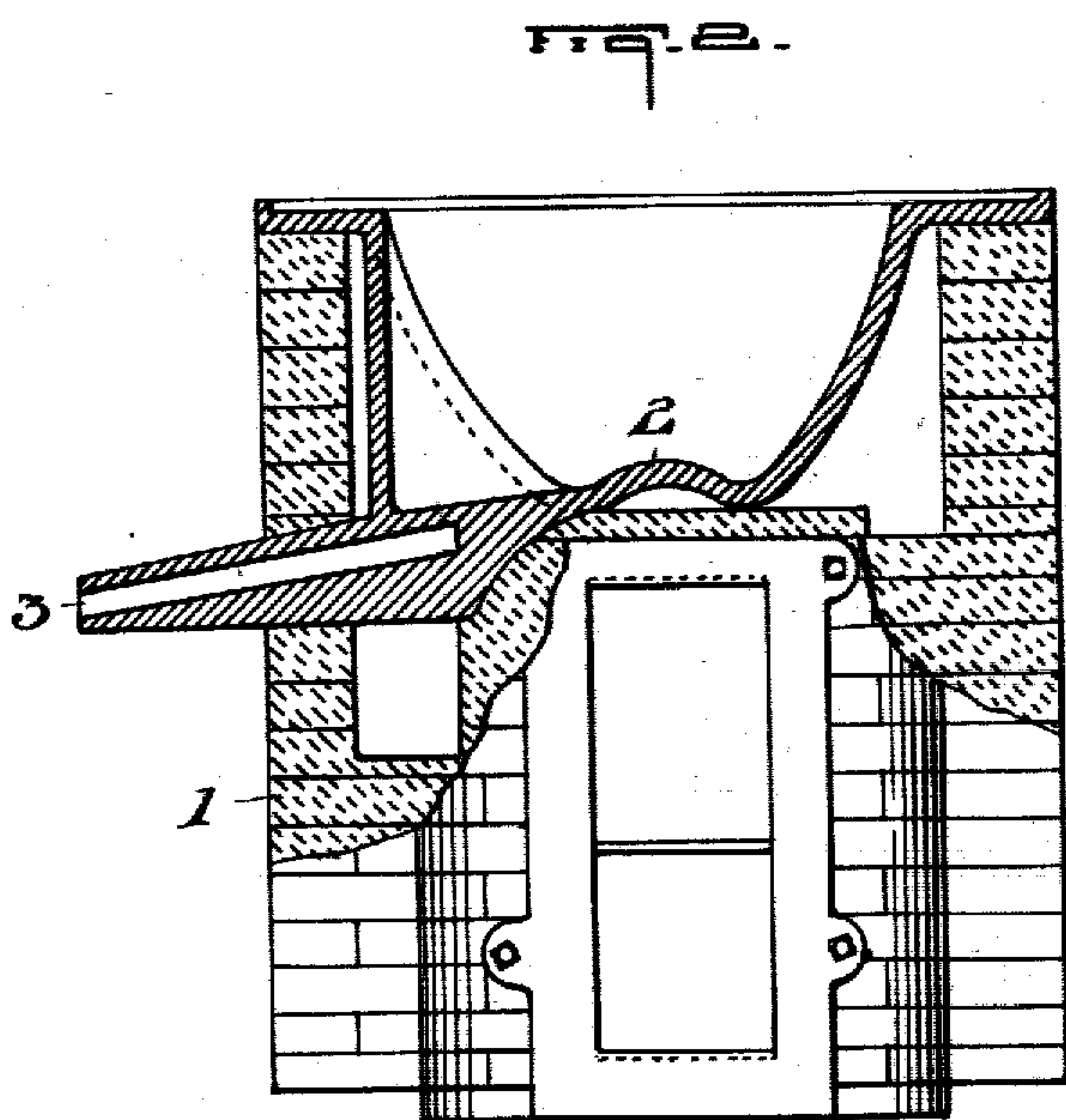
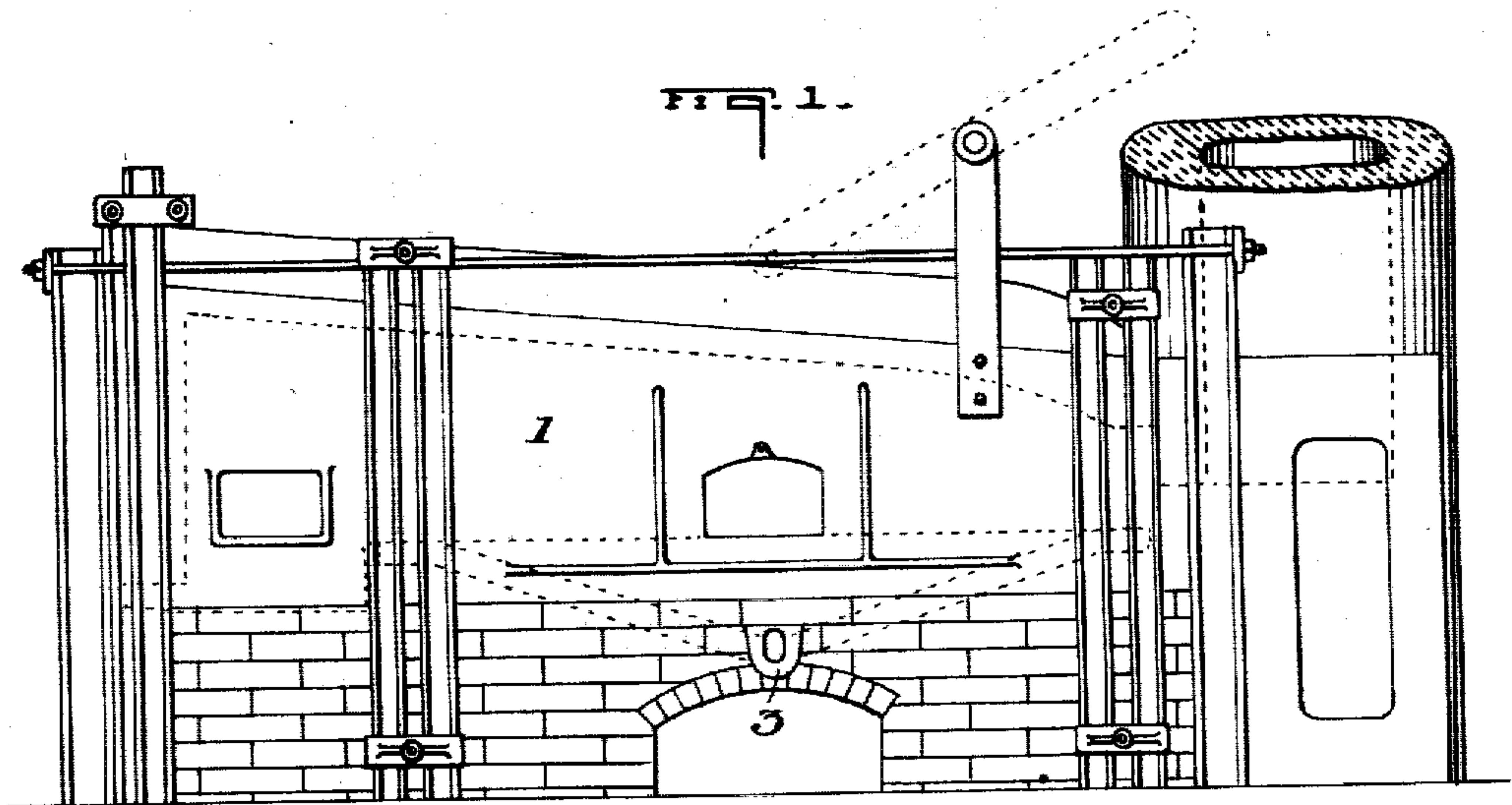


No. 814,334.

PATENTED MAR. 6, 1906.

J. C. TALIAFERRO.  
PROCESS OF RECOVERING TIN OR TIN AND LEAD.  
APPLICATION FILED MAR. 27, 1905.



WITNESSES:  
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*by Pierce & Barker,*  
his ATTORNEYS



# UNITED STATES PATENT OFFICE.

JOHN C. TALIAFERRO, OF BALTIMORE, MARYLAND, ASSIGNOR TO CONTINENTAL CAN COMPANY, OF NEW YORK, N. Y., A CORPORATION OF NEW JERSEY.

## PROCESS OF RECOVERING TIN OR TIN AND LEAD.

No. 814,334.

Specification of Letters Patent.

Patented March 6, 1906.

Application filed March 27, 1905. Serial No. 252,343.

*To all whom it may concern:*

Be it known that I, JOHN C. TALIAFERRO, a citizen of the United States, residing at Baltimore, State of Maryland, have invented a new and useful Improvement in the Processes of Recovering Tin or Tin and Lead, of which the following is a specification.

In the accompanying drawings, which make part of this specification, Figure 1 is a front elevation, and Fig. 2 a cross-section, of a furnace suitable for fusing the tin in the mixture; and Fig. 3 shows in vertical section a suitable charcoal-furnace for treating the skimmings.

The purpose of my invention, generally stated, is the separation of tin or tin and lead from a mixture of iron or steel.

The process is peculiarly applicable to the recovery of tin or tin and lead from the mixture of these metals which has been recovered from iron or steel sheets or articles made from iron or steel sheets.

The metallic tin which has been removed from tin-scrap by the electrolytic process of detinning or by like processes is largely amalgamated with the sheet metal or other base which has been coated with tin. Heretofore it has not been practicable to use the tin removed from scrap-tin, as above stated, for the purpose of making solder, which is a mixture of tin and lead alone and which requires to be free, or substantially so, from the presence of iron or other deleterious metal, and for that reason great loss has been sustained by the producers of detinned plate, because the tin powder produced thereby could not be satisfactorily refined into pure metallic tin suitable for making solder, but could only be used for textile work or other uses when it has a much less commercial value than the pure pig-tin of commerce. My invention removes this objectionable feature entirely and restores the pig-tin recovered by the detinning process (which carries a large percentage of iron) to pure metallic tin free from iron or other commercial solder, thereby adding greatly to its value.

The problem to be solved is how to get rid of the iron or steel. The specific gravity of iron and steel does not vary sufficiently from that of tin to effect a separation based on specific gravity. The fusing-point of iron and steel is, however, some 2,500° higher than

the fusing-point of tin. This fact I utilize and fuse the tin, leaving the iron in suspension therein but unfused. I then effect a mechanical stratification by adding enough lead to unite with the fused tin, so that the iron will float to the top of the mixture, where it can be skimmed off. As these skimmings will contain a certain amount of tin and lead, I preferably carry out the process by a further refinement in treating these skimmings to recover the tin or lead. This effects a still further saving; but the main process is quite independent of this subsequent step. When I do, however, save the tin or lead in the skimmings, I take said skimmings to a charcoal-furnace and fuse the tin or lead therein, which trickles down through the charcoal, while the iron remains upon the top of the charcoal bed.

Obviously my invention can be carried out in a variety of ways and by a variety of structures and the essence of it is as above set forth, and the apparatus described is purely illustrative.

1 represents any ordinary furnace having a bed 2 and a tap 3. Into this furnace is charged the mixture designed to be purified. The furnace is raised to a temperature high enough to fuse the tin, but leaving the iron in suspension throughout the fused tin. Lead might be added in the furnace; but for convenience I prefer to tap the mixture out into any suitable vessel, where it is still kept molten, and there add a sufficient percentage of lead as shall by uniting with the tin acquire a sufficient specific gravity to sink to the bottom of the vessel and float the iron to the top. The iron can readily then be removed by skimming.

In order to save the tin and lead inadvertently caught up in the skimmings, the latter are taken to the charcoal-furnace. (Seen in Fig. 3.) This is an ordinary upright furnace filled with charcoal granulated, the metal to be treated being placed on top of the charcoal, which on being fired having a great affinity and purifying effect upon the tin and lead they trickle down through the particles of burning charcoal, running out through a channel provided at the bottom of the furnace for that purpose. Thus the iron is left in the furnace, and the metals being purified and freed from the iron can be mixed in the



proper proportions of tin and lead if not so already and a fine well-refined article of commercial solder is the result.

Having described my invention, I claim—

- 5 1. The process of separating tin or tin and lead from iron or steel which consists in fusing the tin or tin and lead, adding sufficient lead to float the iron or steel to the top of the mixture and mechanically removing the alloy.  
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2. The process of separating tin or tin and lead from iron or steel which consists in fusing the tin or tin and lead, adding sufficient lead to float the iron or steel to the top of the  
15 mixture and skimming off the iron or steel.
3. The process of separating tin or tin and

lead from iron or steel which consists in fusing the tin or tin and lead, adding sufficient lead to float the iron or steel to the top of the mixture, skimming off the iron or steel and 20 separating the tin and lead from the iron or steel in said skimmings by melting the same on charcoal.

In testimony whereof I, the said JOHN C. TALIAFERRO, have signed my name to this 25 specification, in the presence of two subscribing witnesses, this 4th day of March, 1905.

JOHN C. TALIAFERRO.

Witnesses:

B. H. LARKIN,  
BLANCHE A. OULD