

March 13, 1934.

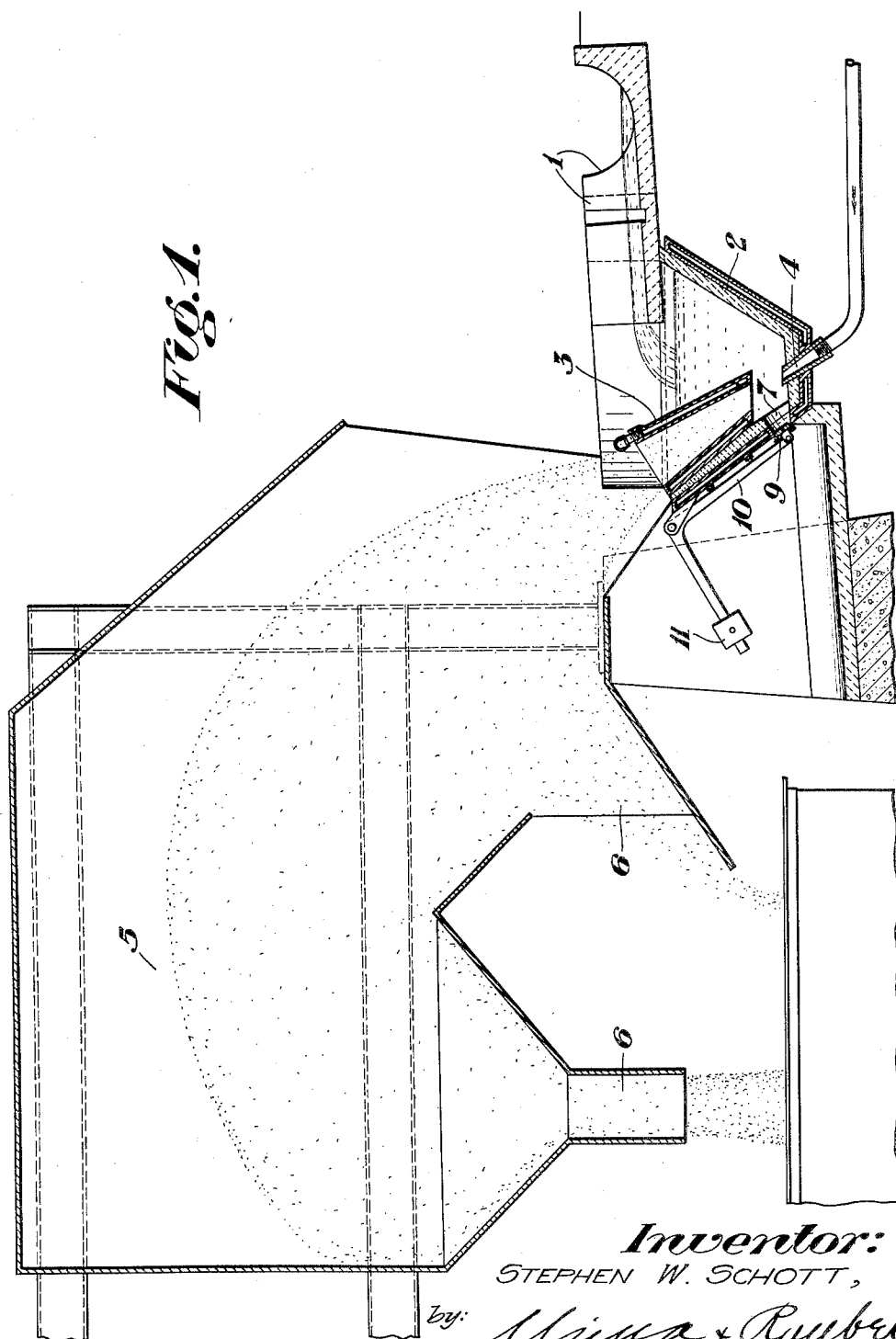
S. W. SCHOTT

1,950,932

SLAG GRANULATION

Filed Nov. 24, 1931

3 Sheets-Sheet 1



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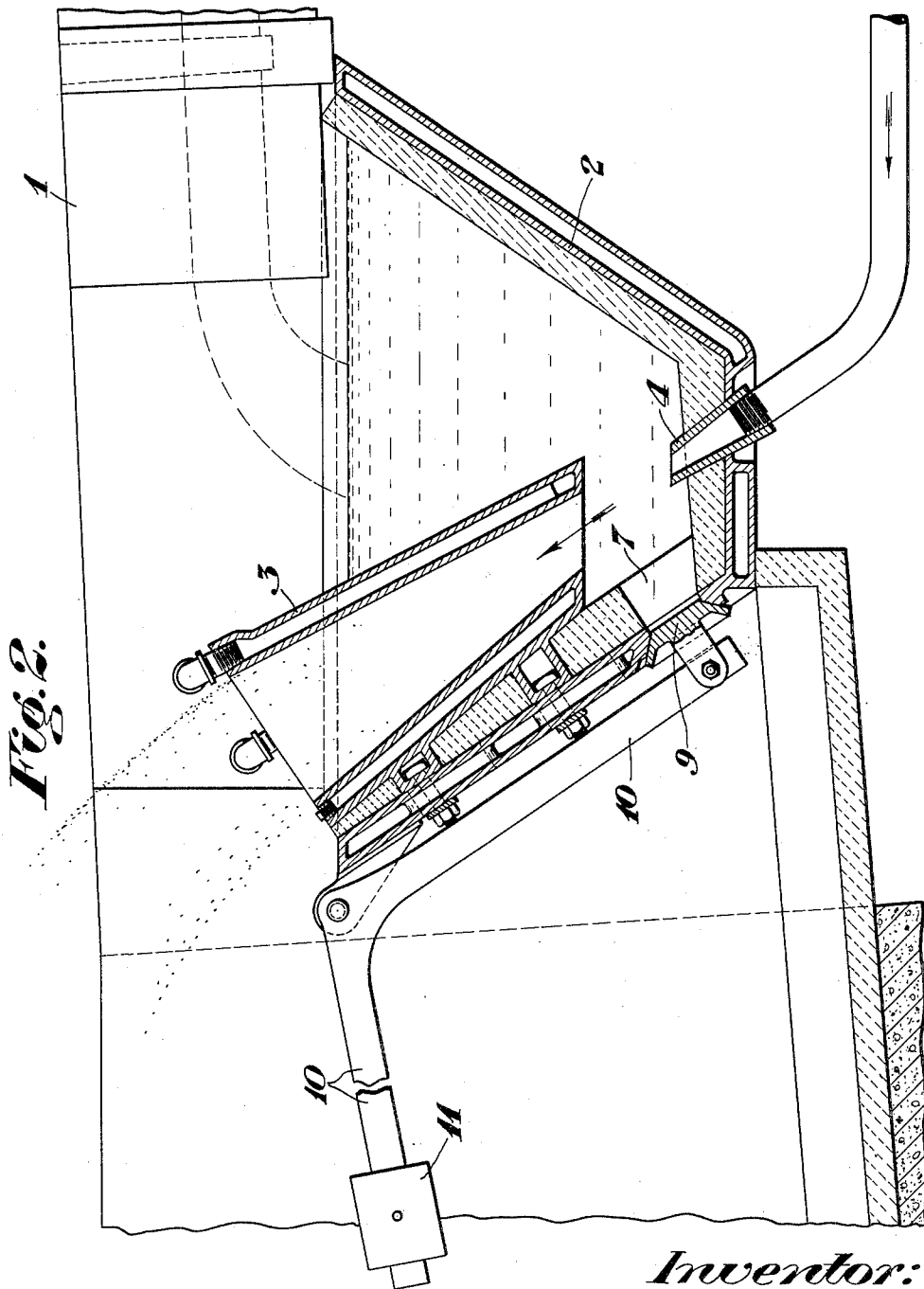
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3 Sheets-Sheet 2



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3 Sheets-Sheet 3

Fig. 4.

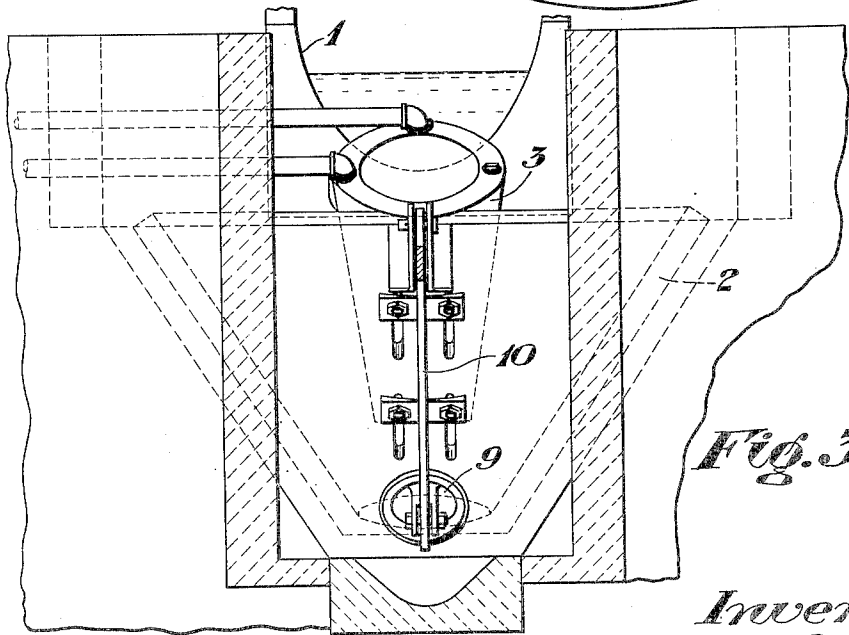
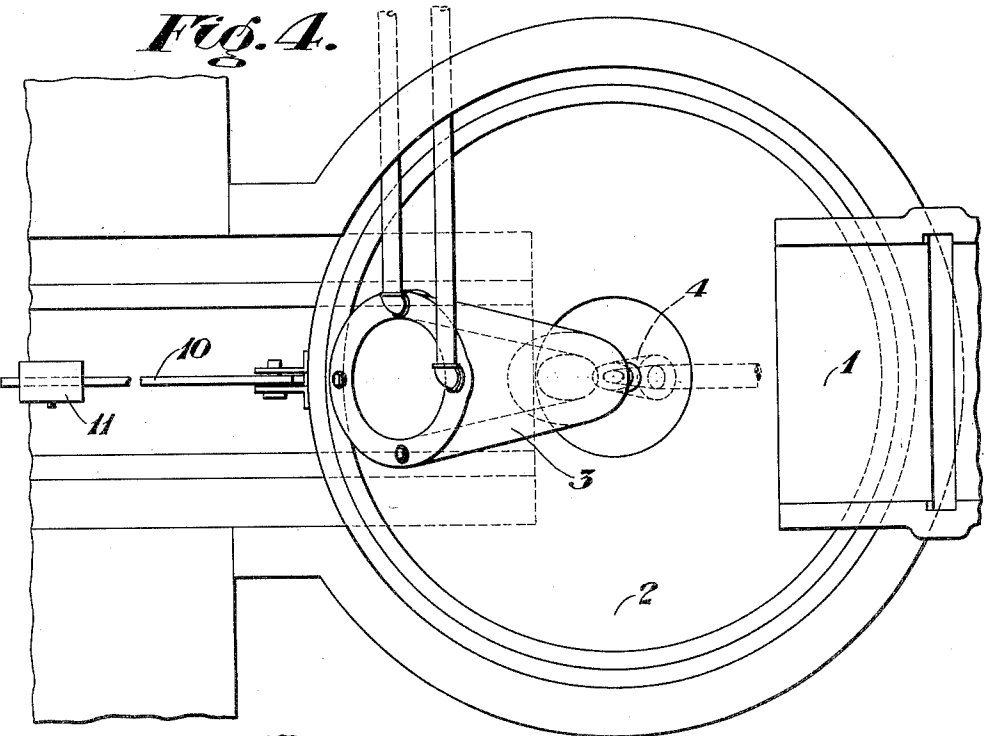


Fig. 3.

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UNITED STATES PATENT OFFICE

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SLAG GRANULATION

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Application November 24, 1931, Serial No. 577,144

7 Claims. (Cl. 83—91)

This invention relates to a process of granulating blast furnace slags and the like, and also to a particular form of apparatus for accomplishing this. An object of the invention is to convert molten slag into a hard, granulated slag having a minimum moisture content but of sufficient friability as to easily be crushed or pulverized.

Having reference to the accompanying drawings:

Figure 1 is a cross-sectioned side elevation of one form of the invention, and is illustrative of both the process and a particular form of apparatus.

Figure 2 is an enlarged detail from Figure 1.

Figure 3 is an end view of Figure 2.

Figure 4 is a top plan of Figure 2.

In detail, a runner 1 carries molten slag, discharged by a blast furnace, into a flat bottomed, cone-shaped container 2. The flow of this slag is regulated to constantly maintain a predetermined level in this container. An inverted, elongated, frusto-conical shell 3 is incliningly positioned in this container so that its greater portion will be submerged in the body of slag. Because of the heat involved, both this shell and the container are preferably water cooled.

A nozzle 4 is axially aligned with this shell adjacent its submerged end, dry steam or air being ejected through this nozzle into the body of slag, under pressure.

When fluid is injected into the slag through this nozzle it will carry a portion up through the shell 3. This portion will be ejected from the body of slag in granulated particles having the desired characteristics.

Preferably, the distance of the separation of the shell 3 and the nozzle 4 is made adjustable, one method being to adjustably mount the shell 3 on the slag container's side.

A hopper 5 is positioned adjacent the unsubmerged end of the shell 3, from which the granulated slag emerges, this hopper being in the general direction of the inclination of the shell. The granulated slag collects in this hopper and drops into a railway car through outlets 6.

The container 2 is preferably lined with fire brick or other refractory material and is provided with an outlet 7 having a closure 9. This closure is carried on one end of a pivotally mounted angle-arm 10, a weight 11 being carried on this arm's other end to keep the closure in the outlet 7.

Although a specific form of the invention has been shown and described in accordance with the patent statutes, it is to be understood that it is not desired to limit the invention exactly thereto, except as defined in the appended claims.

I claim:

1. A process of granulating slag consisting in upwardly injecting substantially dry fluid into a pool of molten slag under sufficient pressure

to shower portions of this slag upwardly from the pool at a sufficient angle to prevent the slag falling back into the same.

2. A process of granulating slag consisting in maintaining a pool or molten slag, inclining upwardly injecting substantially dry fluid into the lower portion of this pool under sufficient pressure to eject therefrom a shower of slag particles and collecting these slag particles, the inclination at which said fluid is injected being sufficient to cause the showered particles to fall clear of said pool.

3. An apparatus for granulating molten slag including a slag container, means for maintaining a pool of slag in said container and means constructed and arranged to inject fluid under pressure into said container to upwardly shower slag therefrom in a direction which causes the showered slag to fall clear of said pool.

4. An apparatus for granulating molten slag including a slag container, means for maintaining a body of slag in said container, an inverted frusto-conical shell incliningly positioned in said container so that its greater portion will be submerged in the body of slag and a nozzle axially aligned with said shell adjacent its submerged end.

5. An apparatus for granulating molten slag comprising a slag container, means for constantly maintaining a body of slag in said container, an inverted elongated frusto-conical shell incliningly positioned in said container so that the greater portion will be submerged in the body of slag, means for cooling said shell, a nozzle axially aligned with said shell adjacent its submerged end, and a hopper positioned adjacent the unsubmerged end of said shell and in the general direction of its inclination.

6. An apparatus for granulating molten slag comprising a slag container, means for constantly maintaining a body of slag in said container, an inverted elongated frusto-conical shell incliningly positioned in said container so that its greater portion will be submerged in the body of slag, means for cooling said shell, a nozzle axially aligned with said shell adjacent its submerged end, a hopper positioned adjacent the unsubmerged end of said shell and in the general direction of its inclination, and an outlet in the bottom of said container having a gravity operated closure.

7. A process of granulating slag consisting in collecting it in a molten pool and blowing the slag upwardly through a confined flow path from below the surface of the pool at a sufficient angle to prevent the slag falling back into the pool.

STEPHEN W. SCHOTT.