July 5, 1932. C. F. WELLS 1,865,491

CUPOLA RESERVOIR

Filed March 14, 1930 2 Sheets-Sheet 1

Fig. 1.

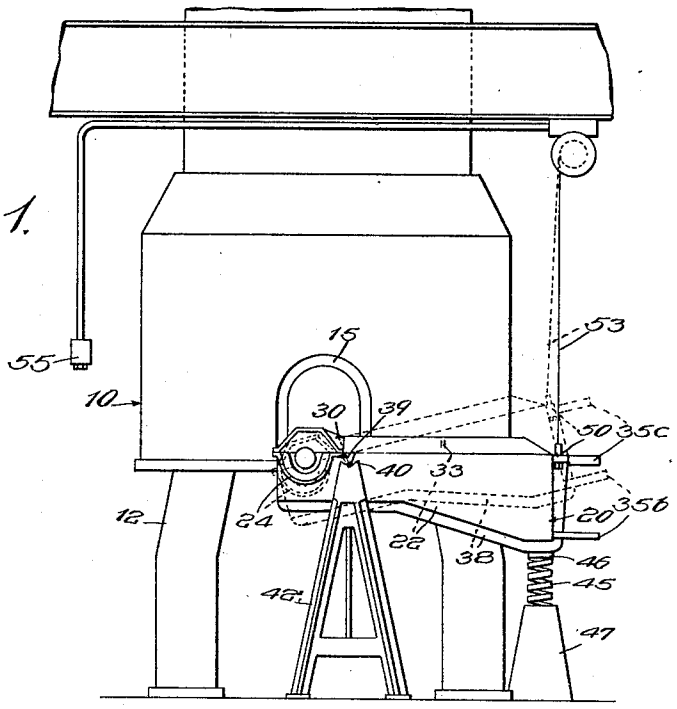
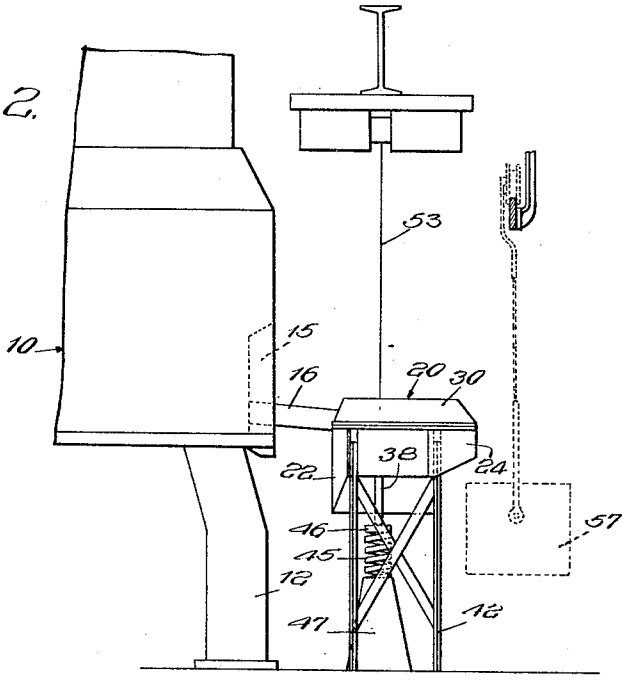


Fig. 2.



Witness:
William P. Wilson

Inventor.
Clayton F. Wells
By Fisher, Clapp, Adams & Bond,
Attys

July 5, 1932. C. F. WELLS 1,865,491

CUPOLA RESERVOIR

Filed March 14, 1930 2 Sheets-Sheet 2

Fig. 3

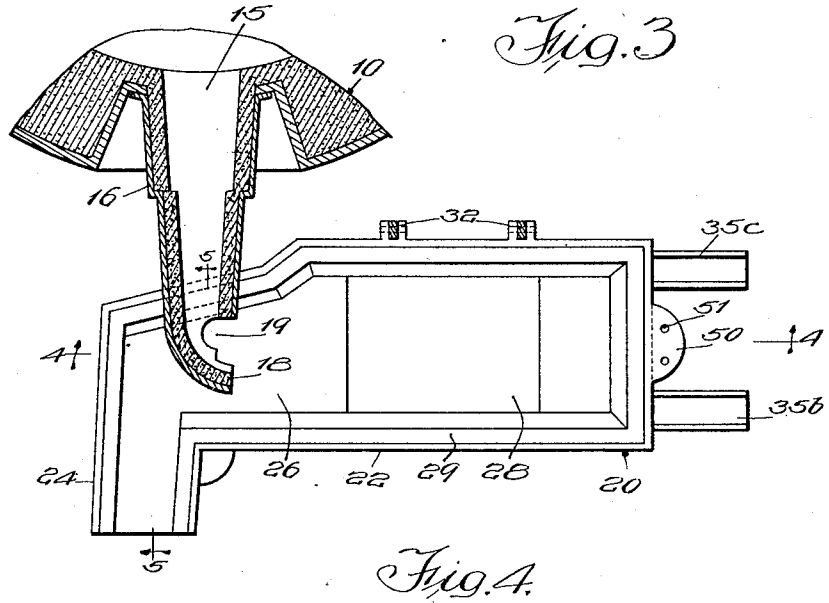


Fig. 4

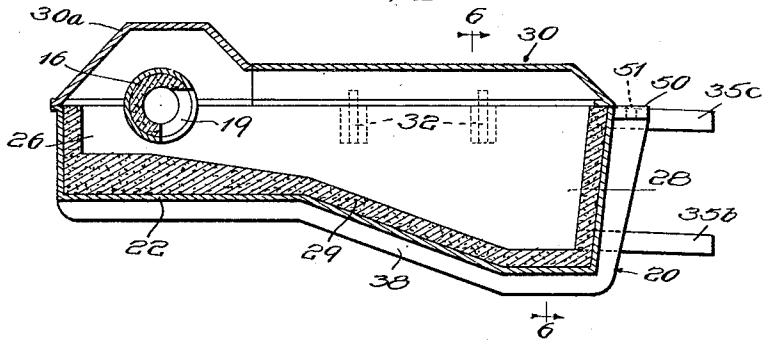


Fig. 5.

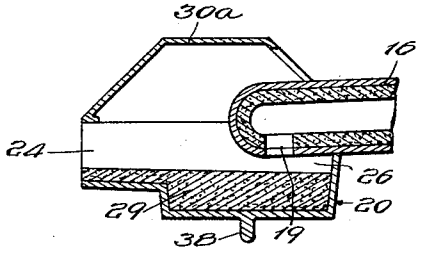
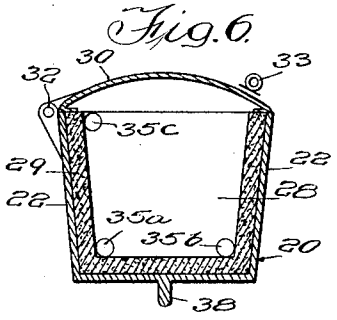


Fig. 6.



Witness:
William P. Kilroy

Inventor:
Clayton F. Wells

By Fisher, Clapp, Soans & Bond,
Attys

Patented July 5, 1932

1,865,491

UNITED STATES PATENT OFFICE

CLAYTON F. WELLS, OF CHICAGO, ILLINOIS, ASSIGNOR TO CHICAGO FOUNDRY COMPANY, OF CHICAGO, ILLINOIS, A CORPORATION OF ILLINOIS

CUPOLA RESERVOIR

Application filed March 14, 1930. Serial No. 435,744.

My invention relates broadly to foundry equipment, and has to do more particularly with a new and improved construction for a cupola reservoir.

According to the old foundry practice, cupolas are tapped by opening the wall thereof. After the molten metal is allowed to run into ladles, the tap hole is then closed by means of a mud ball manipulated in the hands of the operator. Both of the operations of tapping and closing the tap hole are delicate ones and must be performed by a man who is especially skilled in this work. Accidents due to splashing of metal are not infrequent, resulting in serious injury to the operator.

It has accordingly been conceived that the tapping operation in the old sense be entirely eliminated and that the metal be allowed to flow constantly from the cupola into a reservoir from which it may be tapped as desired.

An object of my invention is to provide a cupola reservoir which will be adapted to receive a large quantity of metal from the cupola and from which the metal may be poured whenever desired.

A further object is to provide such a device which will be simple in construction, convenient in operation, and rugged.

Various other objects and advantages will become apparent to those skilled in the art as the description proceeds.

Referring now to the drawings forming part of this specification and showing a preferred embodiment of my invention:

Fig. 1 is a front elevation showing the lower portion of a cupola furnace, together with a device embodying my invention;

Fig. 2 is a side elevational view of the same;

Fig. 3 is a top plan view of such a device without the reservoir cover, with certain portions of the cupola being shown in section;

Fig. 4 is a sectional view taken substantially on the line 4—4 of Fig. 3;

Fig. 5 is a sectional view taken substantially on the line 5—5 of Fig. 3, and

Fig. 6 is a sectional view taken substantially on the line 6—6 of Fig. 4.

In the drawings, the numeral 10 indicates generally a cupola furnace of any well known or other type, supported in elevated position from the ground by means of pedestals 12. The cupola has an opening 15, in which is inserted a tubular outlet member 16 lined with fire brick or the like. It will be noted from Fig. 3 that the outlet member 16 has a laterally projecting spout 18 adapted to change the direction of metal flowing out of the cupola. The lower portion of the spout is preferably cut away at the terminal portion, as at 19.

The reservoir, indicated generally by the numeral 20, comprises a receptacle 22, which in horizontal section as shown in Fig. 3 may be substantially rectangular, having a laterally projecting pouring spout 24. The receptacle 22 comprises a relatively shallow portion 26 adjacent the conduit 16 and a relatively deep pocket portion 28 spaced oppositely from the shallow portion 26, the lower wall of the receptacle sloping downwardly from the shallow portion 26 to the pocket portion, as shown best in Figure 4. The interior of the receptacle 22 is lined with fire brick or clay 29, and it will be noted from Figure 4 that the thickness of the ceramic material is greater in the shallow portion 26 than in the pocket portion. This is to resist the erosion caused by the dropping of metal from the spout 16.

The receptacle 22 is preferably provided with a lid 30, which may be hinged to the receptacle as at 32, and serves to retain the heat within the receptacle. The lid is preferably in two parts, including a portion 30^a clearing the spout 16, and may be provided with an eye bolt or bolts 33 to facilitate raising and lowering the lid.

A plurality of outlets 35^a, 35^b and 35^c are provided in one end of the receptacle 22. It will be noted that the two outlets 35^a and 35^b (Fig. 6) are provided at opposite lower corners at the enlarged end of the receptacle, while the outlet 35^c is in an upper corner thereof. These outlets are provided for various purposes. Thus, the upper outlet 35^c is intended to take care of overflow, should an unduly large quantity of metal be run into the reservoir and not be tapped

off. One of the lower outlets, as 35^a, may be used for draining the reservoir at the end of the day, while the outlet 35^b may be tapped only in an emergency. It will be understood that the outlets 35^b and 35^a will normally be kept plugged.

The lower wall of the reservoir and the end wall adjacent the pocket portion 28 are provided with an outwardly projecting rib 38. The receptacle 22 is provided with trunnions 39 (Fig. 1) which pivot upon a V-shaped seat 40 of a horse or pedestal 42. The enlarged portion of the receptacle rests by means of the rib 38 on a helical compression spring 45 which carries adjacent its upper portion a seat member 46 and is mounted adjacent its lower portion upon a suitable base 47 of concrete or the like.

The receptacle 22 is provided adjacent its enlarged end 28 with an outwardly extending lug 50 (Fig. 3), which may be apertured as at 51 to receive a chain 53 forming part of an electrically controlled chain hoist which may be actuated from a switch 55.

It is believed that the operation of the device will be clear from what has gone before. While the cupola is in operation, the metal will flow in a fairly constant stream through the spout 16 and into the receptacle As the metal is desired for casting, the receptacle may be tilted by means of the chain hoist. The metal as it enters the receptacle will normally flow downwardly into the pocket 28 because of the downwardly sloping lower wall of the receptacle, and when the device is tilted, as shown dotted in Figure 1, the metal is poured into the portion 26, whence it flows out through the spout 24 into a ladle such as indicated by the numeral 57.

Many advantages are incident to my improved construction. Thus, I find that there is effected a great saving in the fuel required to operate the cupola over the old tapping method. Furthermore, by means of my improved construction, a great quantity of metal may be collected within the reservoir, and while I have obtained satisfactory results with a capacity of 2500 pounds of metal without the use of additional heat, the metal being maintained in molten condition by means of the insulating properties of the lining and of the cover, I contemplate reservoirs of even greater capacity. In some cases, I may apply a suitable gas burner to the resrevoir for maintaining the heat thereof, but this is contemplated only for reservoirs having a capacity materially in excess of 2500 pounds.

It will doubtless be apparent to those skilled in the art that many modifications and changes may be made in devices embodying my invention without departing from the spirit thereof, and hence I do not wish to be limited to the particular embodiment shown or uses mentioned except as set forth in the appended claims which are to be interpreted as broadly as the state of the art permits.

I claim as my invention:

1. A cupola reservoir comprising an elongated receptacle having a relatively shallow end and a relatively deep end, said reservoir adapted to receive metal at its shallow end, the bottom wall thereof sloping downwardly from said shallow end to said deep end when said reservoir is in normal receiving position, said receptacle having a pouring outlet adjacent its shallow end, means pivotally supporting said receptacle, and means for tilting said reservoir about said pivot for pouring metal therefrom without interrupting the flow of metal thereto.

2. In combination with a device as defined in claim 1, means for pouring metal into the shallow end of said receptacle, the bottom wall of said receptacle being lined with ceramic material, the thickness of which is greater at the shallow end than at the deep end.

3. In a device of the class described, and in combination with a device for preparing molten metal, a reservoir, means pivotally supporting said reservoir on an axis which if extended would meet said metal-preparing device, means for conducting metal from said last-named device to said reservoir, a pouring spout on said reservoir extending in a direction parallel to that of said axis and means for tilting said reservoir about said axis for pouring metal therefrom.

4. In a device of the class described, a reservoir adapted to receive metal from a certain direction, means for pivoting said receptacle about an axis parallel to said direction for pouring metal therefrom, and a pouring spout on said reservoir extending in a direction parallel to that of said axis.

5. In combination with a device for producing molten metal and having an outlet spout, a reservoir adapted to receive molten metal from said spout, said reservoir having an outlet spout parallel to said first spout, and means for tilting said reservoir about an axis parallel to those of said spouts for pouring metal therefrom.

6. In a device of the class described, a receptacle having a relatively shallow portion and an enlarged portion communicating therewith, the lower wall of said receptacle normally sloping downwardly from said shallow portion into said enlarged portion. said receptacle having an outlet adjacent said shallow portion and adapted to receive metal adjacent said portion, and means for tilting said receptacle about an axis parallel with the direction of flow of metal to said receptacle for pouring metal therefrom without interrupting the flow of metal thereto.

CLAYTON F. WELLS.