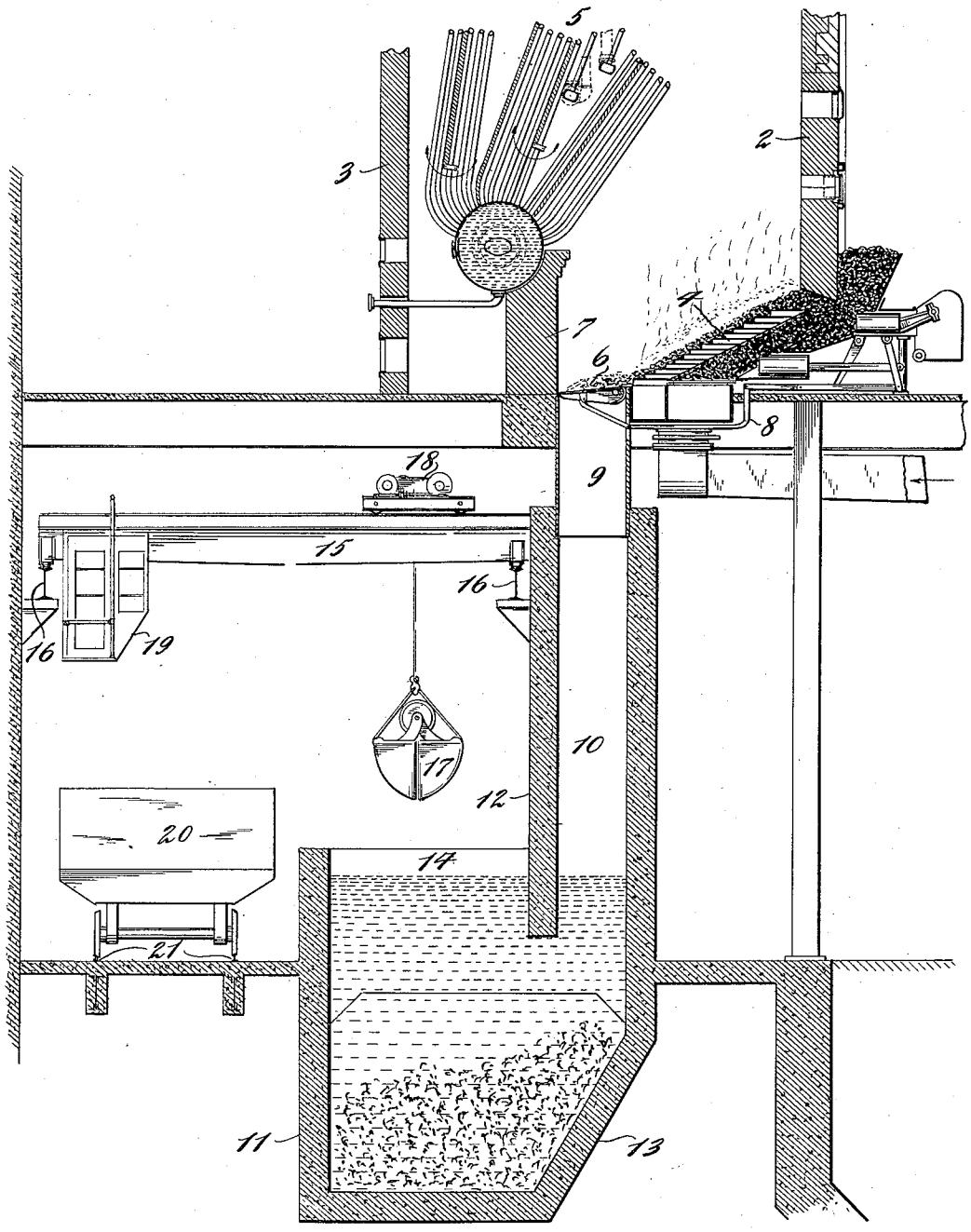
Jan. 9, 1923. 1,441,246

F. SARGENT.

ASH DISCHARGE APPARATUS FOR BOILERS.

ORIGINAL FILED AUG. 20, 1918.



INVENTOR.
Frederick Sargent
BY Clifford W. Burr
His ATTORNEYS.

Patented Jan. 9, 1923. 1,441,246

UNITED STATES PATENT OFFICE.

FREDERICK SARGENT, OF GLENCOE, ILLINOIS, ASSIGNOR TO THE BABCOCK & WILCOX COMPANY, OF BAYONNE, NEW JERSEY, A CORPORATION OF NEW JERSEY.

ASH-DISCHARGE APPARATUS FOR BOILERS.

Application filed August 20, 1918, Serial No. 250,653. Renewed June 2, 1922. Serial No. 565,404.

To all whom it may concern:

Be it known that I, FREDERICK SARGENT, a citizen of the United States, residing at Glencoe, in the county of Cook, State of Illinois, have invented a new and useful Improvement in Ash-Discharge Apparatus for Boilers, of which the following is a full, clear, and exact description, reference being had to the accompanying drawings, forming part of this specification, in which the figure is a longitudinal vertical section showing one form of apparatus carrying out my invention.

My invention relates to apparatus for handling the ash and refuse from boiler furnaces, particularly those employing mechanical stokers. The object of the invention is to avoid the present method of removing ashes, clinkers, etc., from boiler furnaces, which is at present laborious and unhealthy, owing to the gases and dust from the ashes. Another object is to thoroughly quench the ash and refuse and thereby avoid any possibility of fires arising therefrom. A further object is to avoid overheating and warping of the ash hoppers ordinarily employed.

My invention consists essentially in dumping the ash and refuse into a receptacle of relatively large capacity containing sufficient water to quench and cover one or more cleanings of the fire. The bottom receptacle is preferably arranged in such form that the ash and refuse will be collected at a point where it can be readily removed by mechanical apparatus for this purpose, preferably in the form of a grab bucket carried on a traveling crane. The receptacle is also preferably so arranged that the discharge chute is water-sealed to prevent inlet of air to the combustion chamber through this chute.

In the drawings, 2 represents a portion of the front wall and 3 a portion of the rear wall of a boiler setting having an underfeed stoker conventionally represented at 4. I have shown at 5 a portion of a Stirling boiler, although it will be understood that any desirable type of boiler may be used.

The underfeed stoker is provided with rear dumping plate mechanism 6 in front of the bridge wall 7 and upon which ash and cinder are collected during the operation of the stokers. This dumping mechanism may be operated through any suitable connection shown at 8 and is arranged above the upper end of a vertically extending metallic chute or chutes 9 leading downwardly into a concrete chute or chutes 10, at the bottom of which is a concrete water receptacle 11 of large capacity. The rear wall 12 of the chute preferably extends below the water level in the receptacle 11 to provide a water seal against inlet of air; and the forward lower portion 13 of the receptacle is preferably inclined rearwardly so as to direct the ash and cinders rearwardly underneath the open top portion 14 of the receptacle. This water receptacle is of such a form and capacity that the ash and refuse from one or more cleanings of the fire will lie entirely underneath the surface of the water, the volume of water being such that an undue amount of steam will not be generated in quenching and cooling the ash and refuse. The water receptacle 11 is also preferably placed at such a distance below the stoker as to allow any pieces of clinker and any heated unburned fuel to reach a conisderable velocity before striking the water, thereby minimizing the amount of steam that is formed when they strike the water surface.

The ashes and cinders may be removed from the receptacle by any desirable means; but preferably by means of an overhead traveling crane 15 mounted on tracks 16, extending transversely underneath the rear portion of the boiler setting and having a grab bucket 17 suspended from the crane trolley 18. 19 is the crane cage from which the movements of the crane and grab bucket are controlled.

After the grab bucket is lowered into the water receptacle and filled with ashes and cinders it is hoisted to the proper level and then moved along the traveling crane to a point over a car 20 movable on track 21 and dumped thereinto.

In case of a battery of boilers, the crane may serve a number of these water receptacles for several boilers. There may be one or more of the dumping plates and chutes leading into the water receptacle for each boiler; and the water receptacle may be common to several boilers arranged in battery.

The advantages of my invention will be

obvious to those skilled in this art. The laborious, unpleasant and unhealthy occupation of removing the hot ashes, clinker, etc., is avoided and the noxious gases and dust are prevented from escaping into the atmosphere. The ash and clinker are thoroughly quenched, thus avoiding danger from fires after they are removed. Further, the difficulty of overheating and warping of the ash hoppers is eliminated and the removal of the refuse cheapened, the amount of labor also being reduced. The water seal prevents any entrance of air through the ash and clinker chute and this aids in the efficiency. It is desirable, so far as possible, to prevent steam formed by quenching the hot ashes from passing into the combustion chamber. By arranging the lower end of the chute as shown, the ashes and clinker move by gravity away from the end of the chute and into the main open part of the receptacle, thus causing most of the steam generated by the hot ashes to escape from the water outside the chute, and at the same time, bringing the refuse to a position from which it may be readily removed from the receptacle by grab buckets or the like as shown.

Many variations can be made in the form and arrangement of the water receptacle, chutes leading thereinto, means for removing the quenched refuse etc., without departing from my invention.

What I claim and desire to secure by Letters Patent of the United States is:—

1. A boiler furnace having a mechanical stoker arranged to discharge ashes and refuse at one end of the grate, a relatively narrow and long discharge chute under the ash disposal end of the grate only and extending downwardly, and a water receptacle at the lower end of the chute with the walls of the chute extending into the water in the receptacle to form an air seal, the lower portion of the chute being arranged to cause the ashes and refuse to gravitate into the receptacle and away from the end of the chute.

2. A boiler furnace having a mechanical stoker arranged to discharge ashes and refuse at one end of the grate, a relatively narrow and long discharge chute under the ash disposal end of the grate only and extending downwardly, a water receptacle at the lower end of the chute with the walls of the chute extending into the water in the receptacle to form an air seal, and means for removing the quenched ashes and refuse from the receptacle while maintaining the air seal.

3. A boiler furnace having a mechanical stoker arranged to discharge ashes and refuse at one end of the grate, a relatively narrow and long discharge chute under the ash disposal end of the grate only and extending downwardly, and a water receptacle at the lower end of the chute with the walls of the chute extending into the water in the receptacle to form an air seal.

4. A boiler furnace having a mechanical stoker arranged to discharge ashes and refuse at one end of the grate, a chute having a vertical portion under the ash disposal end of the grate only, a water receptacle at the lower end of the chute with the walls of the chute extending into the water in the receptacle to form an air seal, the receptacle outside the chute being open to the air to permit the steam formed therein to escape outside the chute, and the lower portion of the chute being arranged to cause the ashes and refuse to gravitate from beneath the vertical portion of the chute, whereby the greater part of the steam formed through the quenching of the ashes will escape from the water outside the chute.

In testimony whereof I have hereunto signed my name in the presence of two subscribing witnesses.

FREDERICK SARGENT.

Witnesses:
D. JACOBUS,
JOHN A. W. DIXON.