S. B. MOTT.

ASH REMOVER.

APPLICATION FILED OCT. 22, 1919.

1,381,132.

Patented June 14, 1921.

3 SHEETS—SHEET 1.

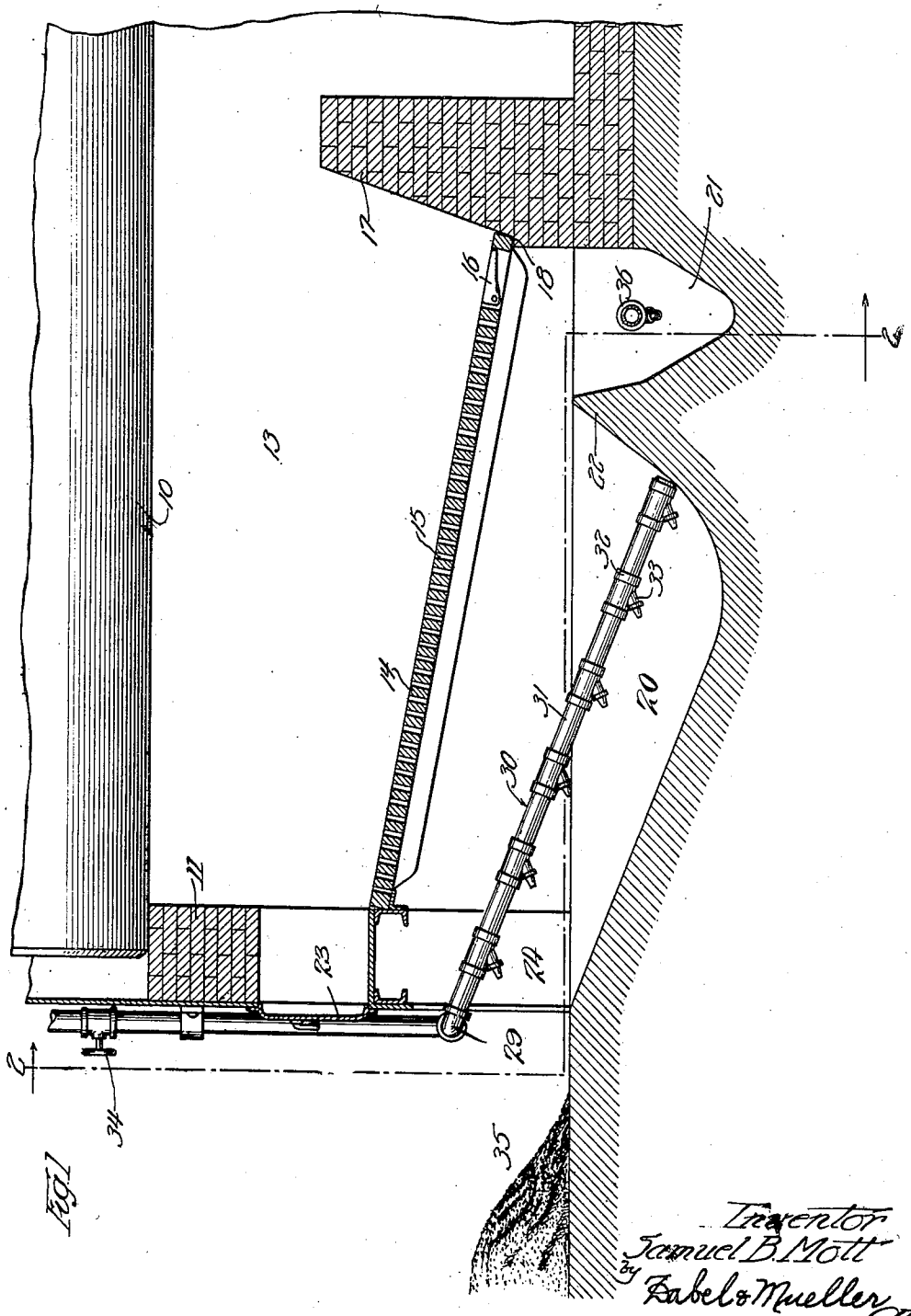


Fig 1

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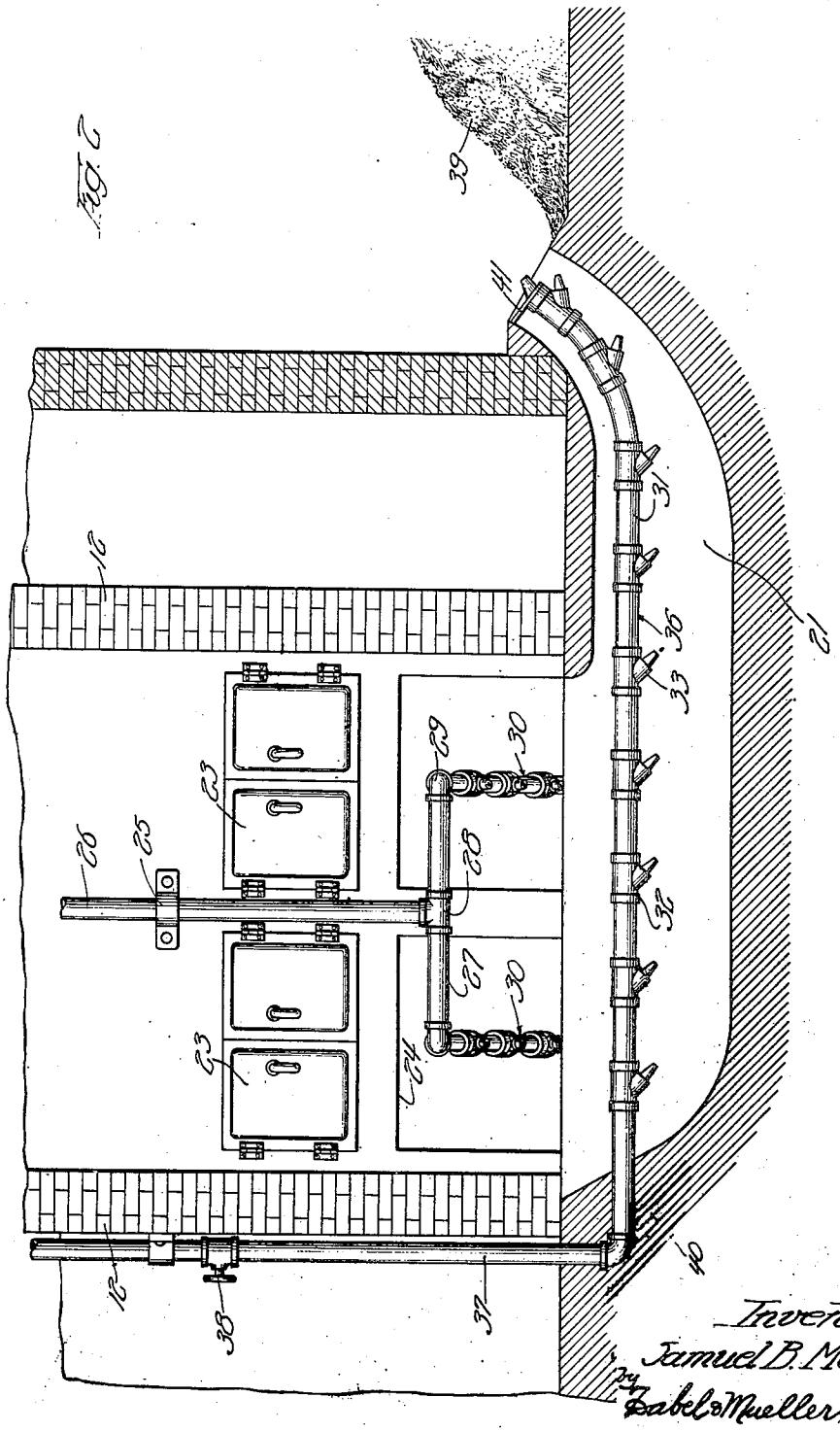
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3 SHEETS—SHEET 2.



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3 SHEETS—SHEET 3.

Fig 3

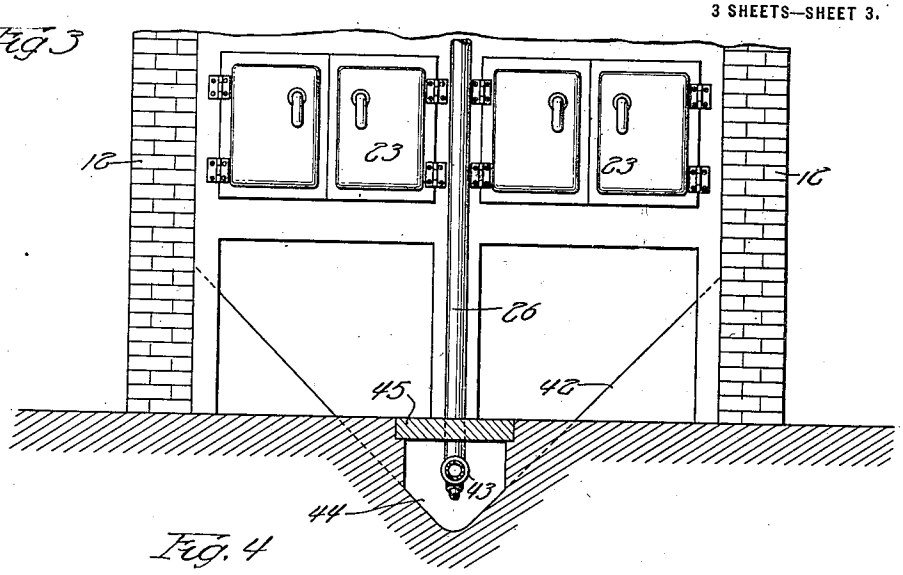
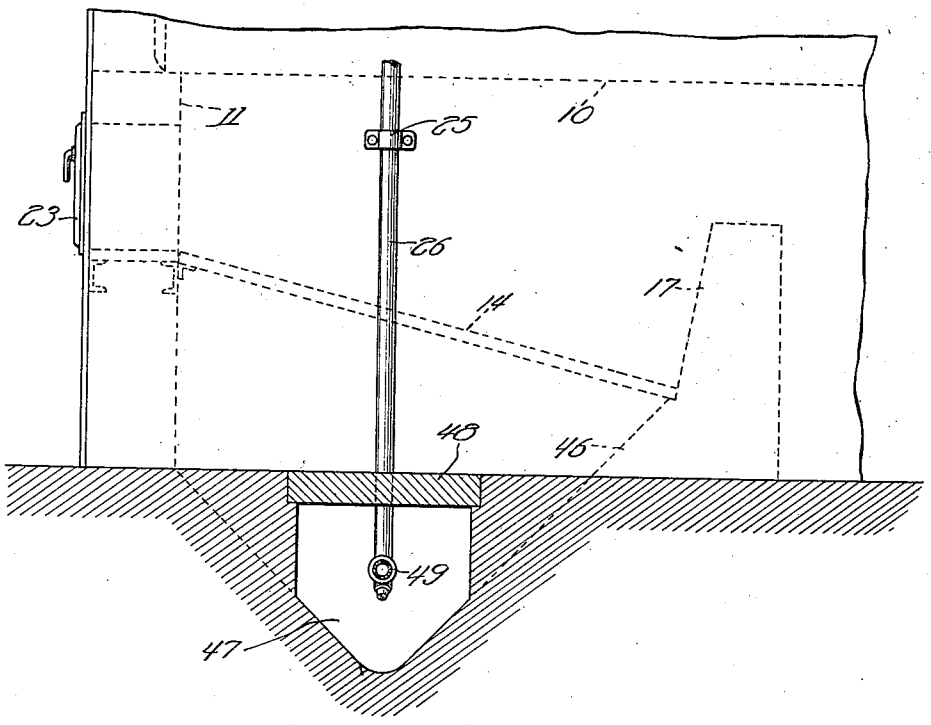


Fig. 4



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UNITED STATES PATENT OFFICE.

SAMUEL B. MOTT, OF NOBLESVILLE, INDIANA.

ASH-REMOVER.

1,381,132. Specification of Letters Patent. Patented June 14, 1921.

Application filed October 22, 1919. Serial No. 332,537.

To all whom it may concern:

Be it known that I, SAMUEL B. MOTT, a citizen of the United States, residing at Noblesville, in the county of Hamilton and State of Indiana, have invented a certain new and useful Improvement in Ash-Removers, of which the following is a full, clear, concise and exact description, reference being had to the accompanying drawings, forming a part of this specification.

My invention relates to furnaces and more particularly to a device for removing ashes and cinders from furnaces.

It is well known that in practically all the furnaces now in use there is provided beneath the furnace grate a pit or cavity into which the ashes and clinkers may drop. In order that these ashes and clinkers shall not interfere with the burning of the fuel, and in order that there shall at all times be sufficient space beneath the grate to permit the air to circulate freely, it is necessary to remove these ashes and clinkers from the pits or cavities.

As a general rule the ash pits are inclined downwardly from the front end toward the rear of the furnace. It is therefore necessary to rake or draw the ashes up the inclined surface of the pit to a position where they may be taken up and hauled away to the ash dump. The removing of the ashes requires considerable heavy labor on the part of the furnace attendant, and it is an object of my invention to make the removing of these ashes and clinkers more simple and easy. I have, therefore, designed a device as disclosed which will automatically blow all the ashes, cinders and clinkers out of the pit either directly onto the ash dump or to a position where they may be readily taken up and hauled away.

It is a further object of my invention to provide an ash removing device which can be readily installed on any of the furnaces now in use.

It is a further object of the invention to provide an ash removing device which is simple to operate, cheap to construct and has no complicated parts to get out of order.

It is a further object of the invention to provide a device which can be readily installed on furnaces having a single ash pit or double ash pit or furnaces having one pit for the ashes and another pit for the clinkers.

Other objects of the invention will be apparent from the detailed description of the device disclosed in the drawings. However, it is to be understood that by this description and the accompanying drawings I do not intend to limit myself to the specific construction disclosed as modifications in the specific structure may be required in the manufacture thereof or may occur to those skilled in this art. The real nature and scope of the invention disclosed is to be determined from the claims appended to this specification. In the drawings where I have disclosed one form of my invention the same reference characters have been used to designate the same parts throughout the several views. In the drawings—

Figure 1 is a longitudinal section of a furnace provided with an inclined grate and separate ash pits for the ashes and clinkers;

Fig. 2 is a sectional view taken on the broken line 2—2 of Fig. 1; Fig. 2 shows a furnace and a double ash pit having transverse pit for the clinkers which transverse pit leads directly to the ash dump outside of the furnace;

Fig. 3 is a front view of a double furnace provided with a single ash pit running longitudinally of the furnace;

Fig. 4 is a side view of a furnace having an ash pit running transversely of the furnace.

In the drawings the numeral 10 designates the usual boiler which may be of any desired type. This boiler is supported as is usual on the masonry abutments 11, the abutment at the rear end of the boiler not being shown. At the sides of the boiler are the usual inclosing walls 12 which may be made of brick, concrete or any other desired material. Beneath the boiler is the furnace 13 having a grate 14 which may be of any desired construction. These grates are usually inclined toward the rear of the furnace and are provided with openings 15 through which the ashes may fall. At the rear of the grate there is provided a dump opening 16. Beyond this dump opening is the usual baffle wall 17 which directs the heated gases upwardly toward the boiler. The rear end of the grate may be supported on a shoulder 18 provided on the baffle wall.

In Figs. 1 and 2 I have shown a furnace provided with a double ash pit and a transverse clinker pit. The ash pits 20 incline downwardly toward the rear of the furnace and are separated from the clinker pits 21

by means of an upstanding wall 22. The upper edge of this wall is preferably made very narrow so that but little ashes will remain on top of the wall.

The furnace is provided with the usual firing doors 23 and beneath these doors there are the usual ash openings 24. If desired these ash openings may be closed by means of doors. At the present time any ashes dropping through the grate into the ash pits 20 must be raked up and out through the openings 24. My device makes it unnecessary to rake the ashes out, but they are blown out of the furnace by means of the following mechanism.

Suitably attached to the front of the furnace by means of a bracket 25 there is a steam supply pipe 26 which leads to the steam chamber of the boiler in order to receive steam pressure from the boiler. This pipe extends downwardly below the firing doors 23 and at its lower end is provided with cross arms 27 which extend sidewardly until their outer ends aline with the deepest points of the pits 20. The arms 27 are connected to the pipe 26 by an ordinary "T" connection 28 as will be clear from the drawings. The free ends of the arm 27 are provided with elbows 29 which open rearwardly and may be inclined downwardly as shown in Fig. 1. Connected to these elbows are pipes, which I may call blast pipes. These pipes are designated as a whole by the numeral 30. The pipes are made up with a number of sections of pipes and fittings so that a blast pipe of any desired length may be set up. The straight sections 31 of the blast pipes are ordinary gas pipes and these are united by means of fittings 32. The fittings are provided with nipples 33 which are connected at an oblique angle to the fittings so that the steam passing out through the nipples will strike the bottom of the ash pits at an oblique angle as is clear from Fig. 1 of the drawings.

The steam supply pipe 26 will be provided with a hand operated valve 34 which controls the admission of steam to the blast pipes 30. When it is desired to remove the ashes from the pit it is only necessary to open the valve 34 and admit the steam to the blast pipes. The steam under pressure escaping through the nipples 33 will readily blow the ashes in front of it out of the pit and into a pile indicated at 35 in Fig. 1 of the drawing. The steam also moistens the ashes and avoids the unpleasant dust usually present when ashes are removed.

From what has been described above it will be apparent that I have devised a very simple means for easily removing the ashes from the ash pits in the furnaces.

When furnaces are provided with clinker pits 21 as shown in Fig. 1 of the drawings, it is necessary to use an additional blast pipe 36 as shown in Figs. 1 and 2 of the drawings. This blast pipe is suitably connected to a steam supply pipe 37 and a valve 38 to control the admission of steam to the blast pipe. The blast pipe 36 is made up of straight sections 31 and fittings 32 provided with nipples 33 as described above. In Fig. 2 I have shown the clinker pit 21 opening outside of the furnace room and directly into the clinker pile 39. Any ashes or clinkers which fall into the pit 21 are therefore blown along and out of the pit and directly into the pile 39. I have shown one end of the pipe 36 supported at 40 in the masonry foundation of the walls and its free end is supported by means of a bracket 41 shown in Fig. 2. While I have shown the pipes 26 and 37 provided with separate valves 34 and 38 for controlling the admission of steam to the blast pipes, it will be apparent that a single valve might be used to control the two pipes. This is a mere matter of mechanical choice of construction and the pipes will be arranged to suit the conditions of the case at hand.

In Fig. 3 I have shown a double furnace provided with a single ash pit 42 which runs longitudinally of the furnace and has its deepest point midway of the furnace. With this construction it will be very apparent that only a single blast pipe 43 is necessary. This blast pipe is constructed like the blast pipes 30 and 36 described above. Beyond the ash pit 42 I construct a tunnel 44 which leads from the ash pit to the ash pile outside of the furnace room. I close the tunnel by means of a removable cover 45. The tunnel and cover are preferably made of concrete.

In Fig. 4 I have shown a furnace constructed with a single ash pit 46 running transversely of the furnace. The ashes collecting in this pit will be blown transversely of the furnace through a tunnel 47 to a point outside of the furnace. The tunnel 47 has a removable cover 48. The blast pipe 49 extends across the pit and through the tunnel so that it will drive the ashes and clinkers from the ash pit. An ash pit positioned as shown in Fig. 4 will accommodate two or more grates depending upon its length.

From what I have described above it will be clear that I have devised a simple and novel means for removing the ashes and clinkers from furnaces which does away with a great deal of manual labor heretofore expended. The device operates successfully and can be operated at any time when the steam is on.

While I have described the use of steam for removing the ashes and clinkers it will be apparent that the pipes 26 and 37 may be connected to a source of compressed air and that the air will operate in the same manner as above stated. It is also to be understood that while I have shown blast

pipes made up of a number of interconnected sections I do not intend to limit myself to this construction as a straight pipe provided with nipples set at an angle will operate as well as that shown. When a pipe is made up of sections as described in the drawings it can be readily constructed of any desired length.

Having thus described my invention what I claim as new and desire to secure by U. S. Letters Patent is:

1. A furnace of the character described comprising a grate, an ash pit beneath said grate, said ash pit having a floor, a blast pipe positioned above said ash pit floor, inclined nipples projecting from said blast pipe toward and at an oblique angle to the floor of said ash pit, and means to admit fluid under pressure to said blast pipe and nipples to blow the ashes out of said pit.

2. A furnace having a firing door and an ash door below said firing door, a grate within said furnace adjacent the firing door, an ash pit below said grate having a bottom inclined downwardly from said ash door, a blast pipe parallel to the bottom of said ash pit and having nipples projecting therefrom toward and at an oblique angle to the bottom of said ash pit and inclined toward the said ash door, and means to admit fluid under pressure to said blast pipe and nipples to cause said fluid to blow the ashes from said pit through the ash door.

3. A furnace having a pit, a pipe parallel to the floor of said pit and having nipples inclined toward one end of said pit and toward and at an oblique angle to the bottom thereof, and means to admit steam under pressure to said pipe and nipples to blow out the material in said pit.

4. A device of the character described comprising a grate, an ash pit beneath said grate and a blast pipe adapted to blow ashes out of said pit, said blast pipe comprising fittings having nipples inclined toward the discharge end and the bottom of the pit and extending at an oblique angle to said pipe and to the bottom of said pit.

5. A furnace comprising a grate, an ash pit below said grate, a blast pipe parallel to the bottom of the ash pit provided with means for projecting fluid under pressure in parallel streams toward the bottom of said ash pit and at an oblique angle to said bottom, whereby said means will operate in the same direction to blow said ashes from said pit, and means for admitting fluid under pressure to said blast pipe.

In witness whereof, I hereunto subscribe my name this 15th day of October A. D., 1919.

SAMUEL B. MOTT.