Aug. 31, 1926. 1,598,121

J. H. CUNNINGHAM

DUST COLLECTOR FOR COAL BURNING HEATERS

Filed Sept. 27, 1923

FIG. 1.

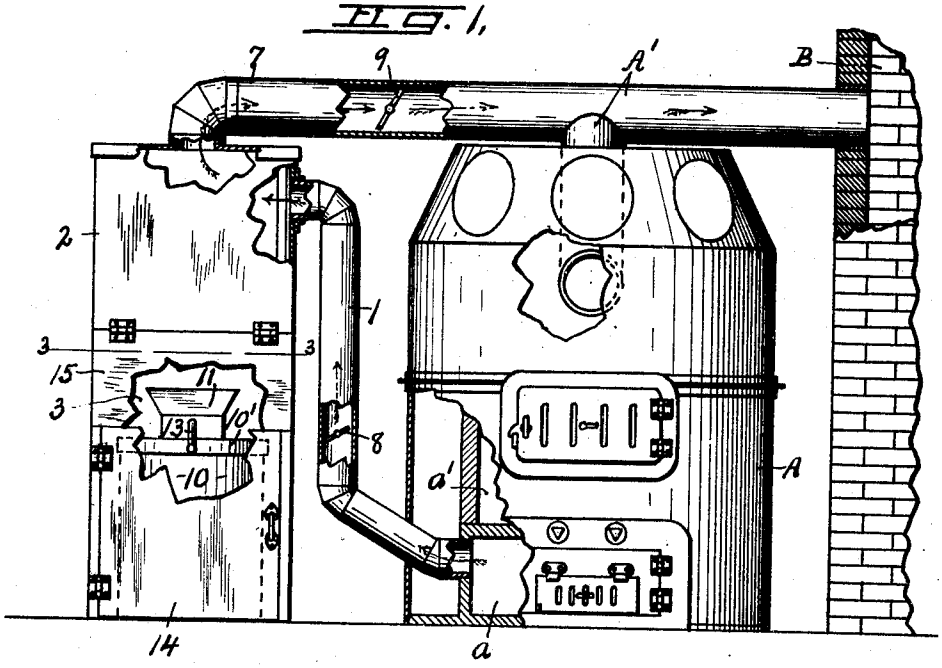


FIG. 2.

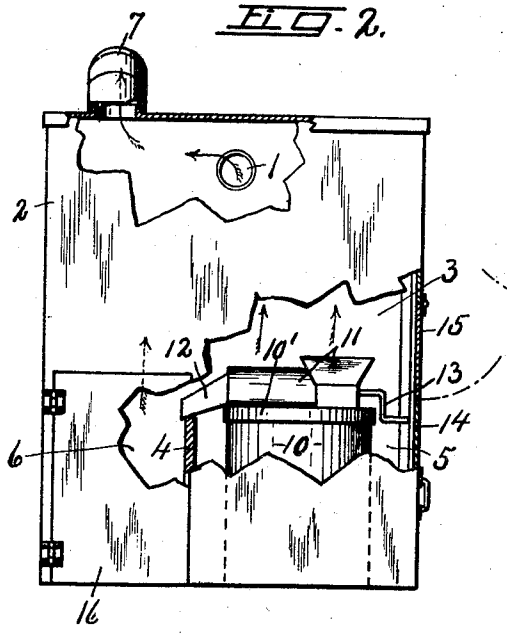
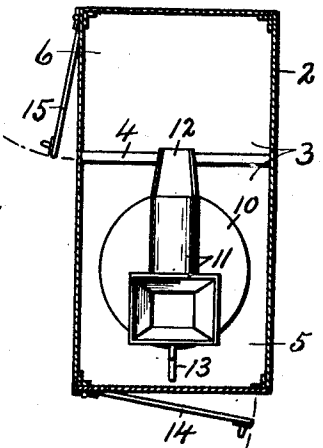


FIG. 3.



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UNITED STATES PATENT OFFICE.

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DUST COLLECTOR FOR COAL-BURNING HEATERS.

Application filed September 27, 1923. Serial No. 665,181.

This invention relates to a dust collector for coal burning furnaces and other heaters commonly used for house and store heating purposes.

It is well known that in heaters of this character, the shaking of the grates for removing the ashes from the fire box into the ash pit causes more or less of the ash dust to escape into the cellar or to collect over and upon the fire to such an extent as to retard the draft and deaden the fire, and that furthermore, in removing the ashes from the ash pit to external receptacles provided therefor, allows more or less of the dust to escape into the room in which the furnace is located and sometimes to pass into the upper rooms through crevices in the floors and around the registers.

The main object of my present invention is to obviate as far as practicable, these difficulties by not only connecting the ash pit to the smoke flue through the medium of a conduit around the outside of the fire box so that the floating dust may be drawn into the smoke flue by the ordinary draft therein when the grates are shaken or by causing said dust to be drawn into a collecting chamber by the same draft and permitting the heavier particles to be precipitated to the bottom of said chamber due to the interposition of the relatively large collecting chamber in the connection between the ash pit and smoke flue.

Another object is to partition the lower portion of the collecting chamber into separate compartments some distance below the dust inlet and outlet so that one chamber may be used for receiving the ashes to be sifted therein, while the other chamber serves to receive the sifted coal separate from the ashes, it being understood that the dust collecting chamber is practically dust proof and is provided with suitable doors for permitting access to the several compartments, particularly for receiving the ashes to be sifted and for removing the sifted coal.

A further object is to provide the dust conduits leading to and from the dust collector with suitable dampers which may be opened when shaking the furnaces or transferring ashes from the ash pit to one of the compartments or may be closed to allow the furnace to be operated in the usual manner and with full force of the draft.

Other objects and uses relating to specific parts of the device will be brought out in the following description.

In the drawings, Figure 1 is a side elevation partly in section, of a portion of a furnace and my improved dust collecting apparatus connected therewith.

Figure 2 is a side elevation partly in section, of the detached dust collector.

Figure 3 is a horizontal view through the dust collector taken on line 3—3, Figure 1.

This dust collector may be used in connection with any suitable coal burning heater as a furnace —A— having an ash pit —*a*—, a fire box —*a'*— and a smoke flue —A'— leading to a suitable chimney —B— and comprises a conduit —1— leading from the ash pit —*a*— to the upper portion of a dust proof casing —2— having a chamber —3—, the lower portion of which is divided by a partition —4— into separate compartments —5— and —6—.

The upper end of the chamber —3— is connected by a conduit —7— to the smoke flue —A'— and is therefore, in direct communication with the chimney —B— so that the draft in the chimney performs a double function of stimulating the fire in the furnace and also of drawing the floating ash dust from the upper portion of the collecting chamber —3— and incidentally, from the ash pit —*a*—.

The furnace —A— and its smoke flue —A'— may be provided with the usual draft dampers and check dampers for controlling combustion of the fuel and may also be provided with the usual conduits leading therefrom to the various parts of the building for heating purposes.

The dust collecting casing —2— may be of any suitable size or form, but is preferably rectangular and arranged in an upright position at one side of the heater in proximity thereto so as to extend some distance above the ash pit.

The conduit —1— has its lower end connected to the ash pit —*a*— and its upper end connected to the dust collecting chamber —3— some distance above the compartments —5— and —6—, and partition —4— and therefore, some distance above the level of the ash pit while its intermediate portion is provided with a valve or damper —8— for controlling the passage of dust from the ash pit therethrough to the collect-

ing chamber and also permitting the collecting chamber to be cut off from the ash pit in order that the full force of the draft may act upon the fuel in the heater in the usual manner.

The conduit —7— is connected to the top of the dust collecting chamber —3— preferably above the upper end of the conduit —1— and is provided with a valve or damper —9— for controlling the passage of dust therethrough and when closed, permits the full force of the draft in the smoke conduit of the furnace to act directly upon the fire in the usual manner.

The upper portion of the casing —2— therefore, forms a part of the conduit leading from the ash pit —*a*— to the smoke flue —A'— of the furnace and constitutes an enlarged portion of said conduit to facilitate the precipitation of the major portion of the heavier dust from the ash pit to the bottom of said chamber, while the lighter particles which may still float in the chamber may be drawn through the conduit —7— into the smoke flue and thence into the chimney.

A portable ash can —10— is movable into and out of the compartment —5— and when in use, normally rests upon the floor of the casing —1— and is provided with a cover —10'— having an ash sifter —11— of any suitable type provided with a discharge nozzle —12— which is adapted to discharge the sifted coal into the compartment —6— over the top of the partition —4—, said ash sifter being of the standard rotary sieve type having the usual crank handle —13— for rotating the ashes to be sifted, and thereby separating the ash from the coal and allowing the ashes to be collected in the can —5— while the coal is discharged into the compartment —6—.

The side of the compartment —5— opposite the partition —4— is provided with a door —14— through which the can —9— may be removed when filled for emptying outside of the building and replaced when emptied.

The same side of the casing which is above the door —14— is provided with an additional drop door —15— in a plane above the upper edge of the partition —4— to permit the ashes which may be shoveled from the ash pit —*a*— to be deposited in the ash sifter —11— for sifting ashes while the doors may be closed to prevent the escape of dust from the interior of the casing except to the conduit —7—. During the sifting operation, the sifted coal is deposited into the compartment —6— which is provided in one side with a door —16— capable of being opened when desired to remove the coal from said compartment.

All parts of the casing —2— including the doors —14—, —15— and —16— are made dust proof when the doors are closed thereby obtaining a maximum draft effect in drawing the floating dust from the upper portion of the receptacle through the conduit —7—, through the smoke flue when the damper —9— is open or from the ash pit when the damper —8— is open.

Operation.

When it is desired to shake the furnace, the draft dampers of said furnace may be closed and the dampers —8— and —9— in the conduits —1— and —7— opened to increase the force of the draft in the upper portion of the chamber —3— whereby the floating dust collecting in the ash pit —*a*— is drawn through the conduit —1— and thence into the upper portion of the chamber —3—, where by reason of the expanded area, the heavier particles of dust are precipitated through the bottom of the receptacle, while the lighter floating particles of dust are drawn into the conduit —7— and thence through the smoke flue —A'— through the chimney.

It is evident however, that the amount of dust precipitated will be comparatively small and insufficient to seriously effect the burning qualities of the sifted coal which may be deposited in the chamber —6—. On the other hand, if it is desired to sift the ashes resulting from the burning of the coal, they may be shoveled from the ash pit —*a*— into the sifter —11— through the open door —15— and after the door is closed, the sifter may be operated to separate the ashes from the coal allowing the ashes to drop into the can —10— and the coal to be deposited in the compartment —6—, while the floating dust which may result from the sifting operation is drawn upwardly into the conduit —7— and thence through the smoke flue into the chimney.

When the grate and sifting operations are completed, the dampers —8— and —9— may be closed to allow the furnace to be operated in the usual manner.

I claim:

1. The combination with a heater having an ash pit and a smoke flue, of a dust conduit having one end extended through an opening in one side of the ash pit below the fire box and its other end operatively connected with the smoke flue outside of the heater, and means operable at will for opening and closing the passage through said conduit.

2. The combination with a heater having an ash-pit, a fire box and a smoke flue, of a dust collecting housing supported at one side of the heater independently thereof, and extended from the level of the ash pit some distance above the level of the fire box, a dust conduit having one end extended through an opening in one side of the ash

pit for communication therewith and its other end connected to said housing at a level above the fire box, and a draft conduit connecting the upper portion of the housing to the flue of the heater.

3. The combination with a heater having an ash pit, a fire box and a smoke flue, of a dust collecting housing supported at one side of the heater independently thereof and extending upwardly from the level of the ash pit some distance above the level of the fire box, a partition extending upwardly from the bottom of the housing and terminating some distance below the upper end thereof for dividing the lower portion of the interior of the housing into separate compartments communicating with each other above the partition, an ash sifting device in one of said compartments provided with means for discharging the coarser materials into the other compartment, and a draft conduit connecting the upper portion of the housing to the flue of the heater.

4. The combination with a coal burning heater having an ash pit below the fire box and a smoke conduit leading from the fire box, a dust-collecting housing supported at one side of the heater independently thereof and extending from the level of the ash-pit above the level of the fire box, a partition rising from the bottom of said housing and terminating some distance below the upper end thereof to form opposite compartments communicating with each other above the partition, a dust conduit having one end connected to the ash pit below the fire box and its other end connected to the interior of the housing some distance above the partition, a damper in said conduit and an additional conduit connected to the dust collector above said partition and also connected to the smoke conduit of the heater, a damper in said additional conduit, between its point of connection with the housing and its point of connection with the smoke conduit.

In witness whereof I have hereunto set my hand this 6th day of September 1923.

JOHN H. CUNNINGHAM.