

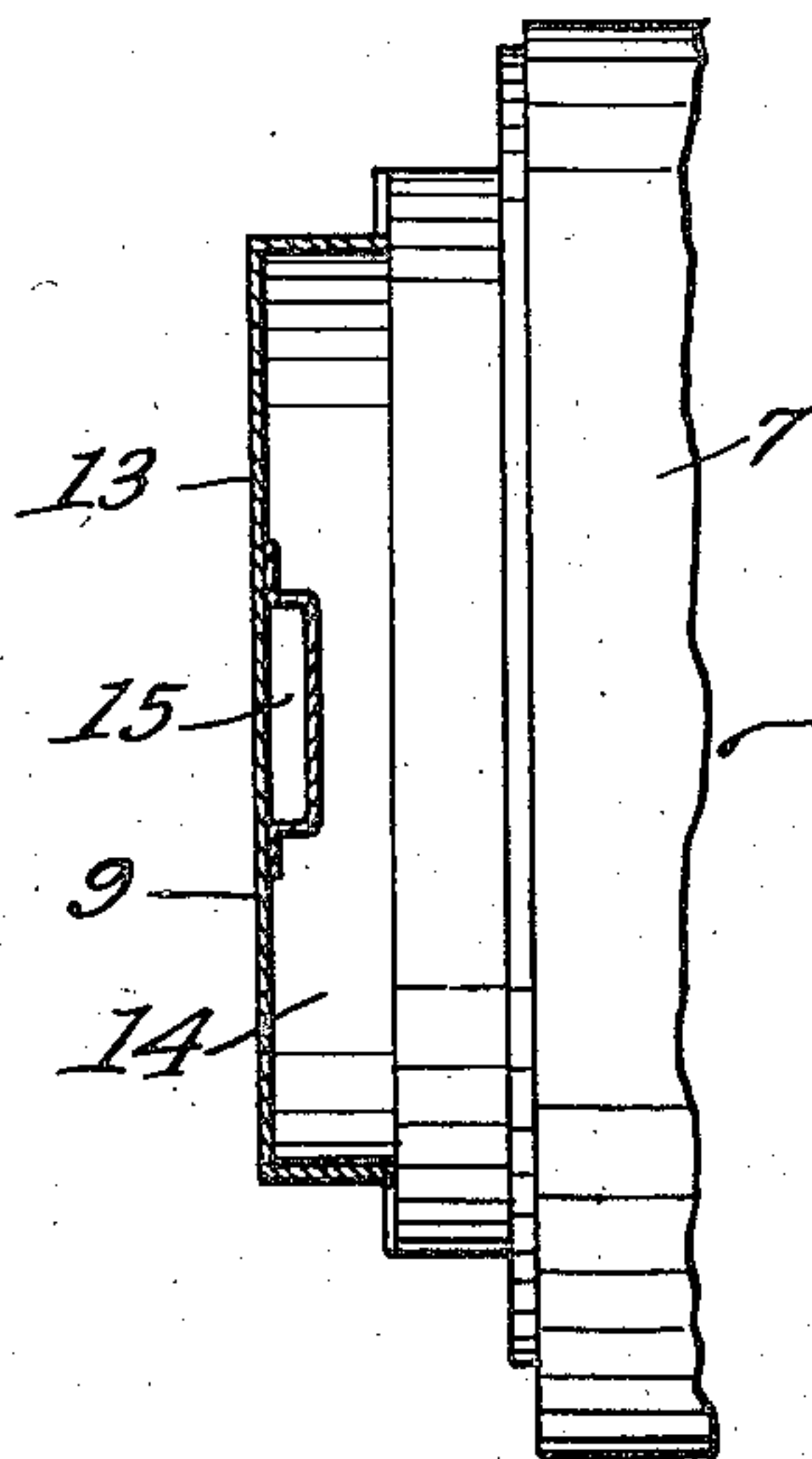
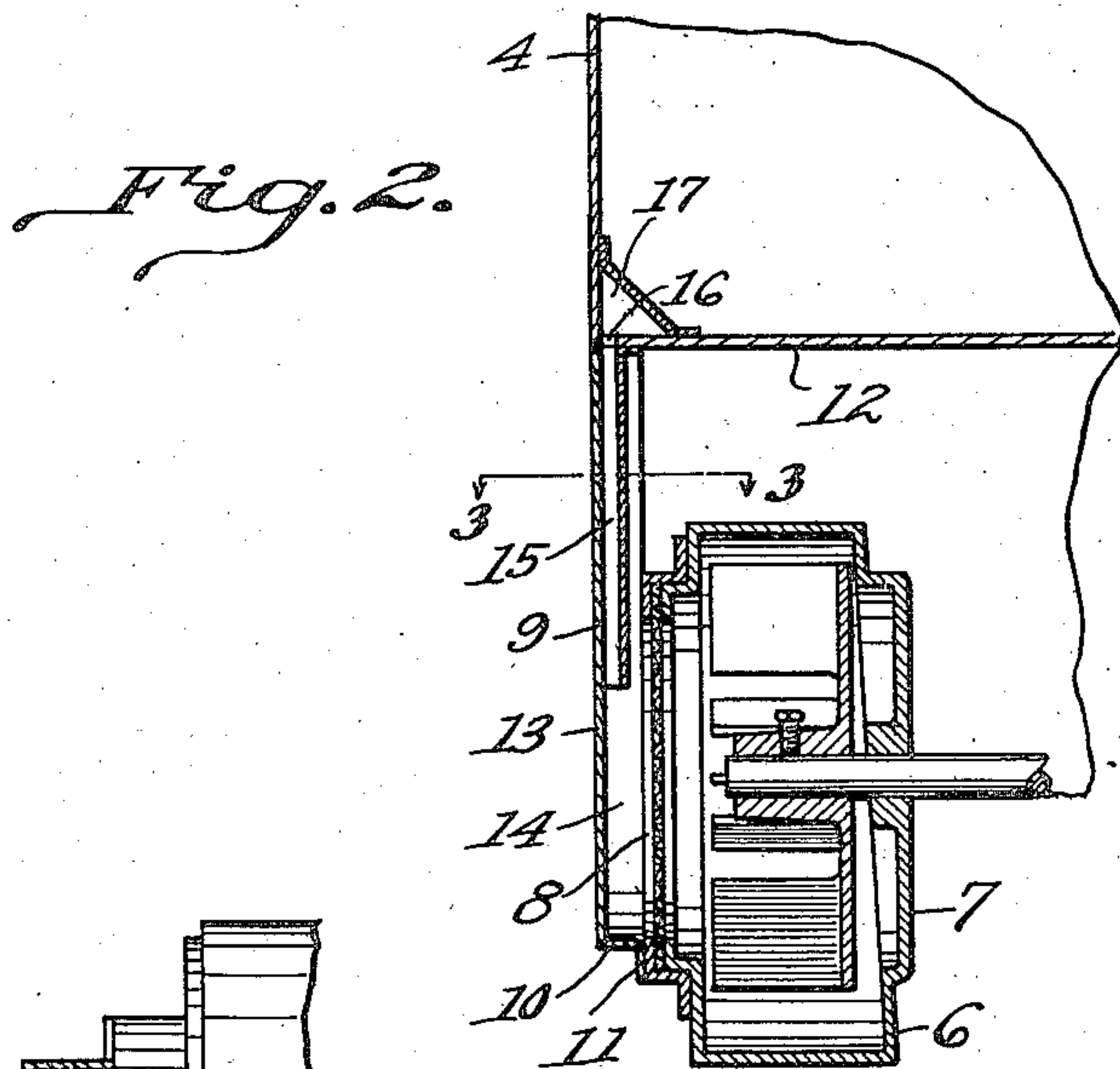
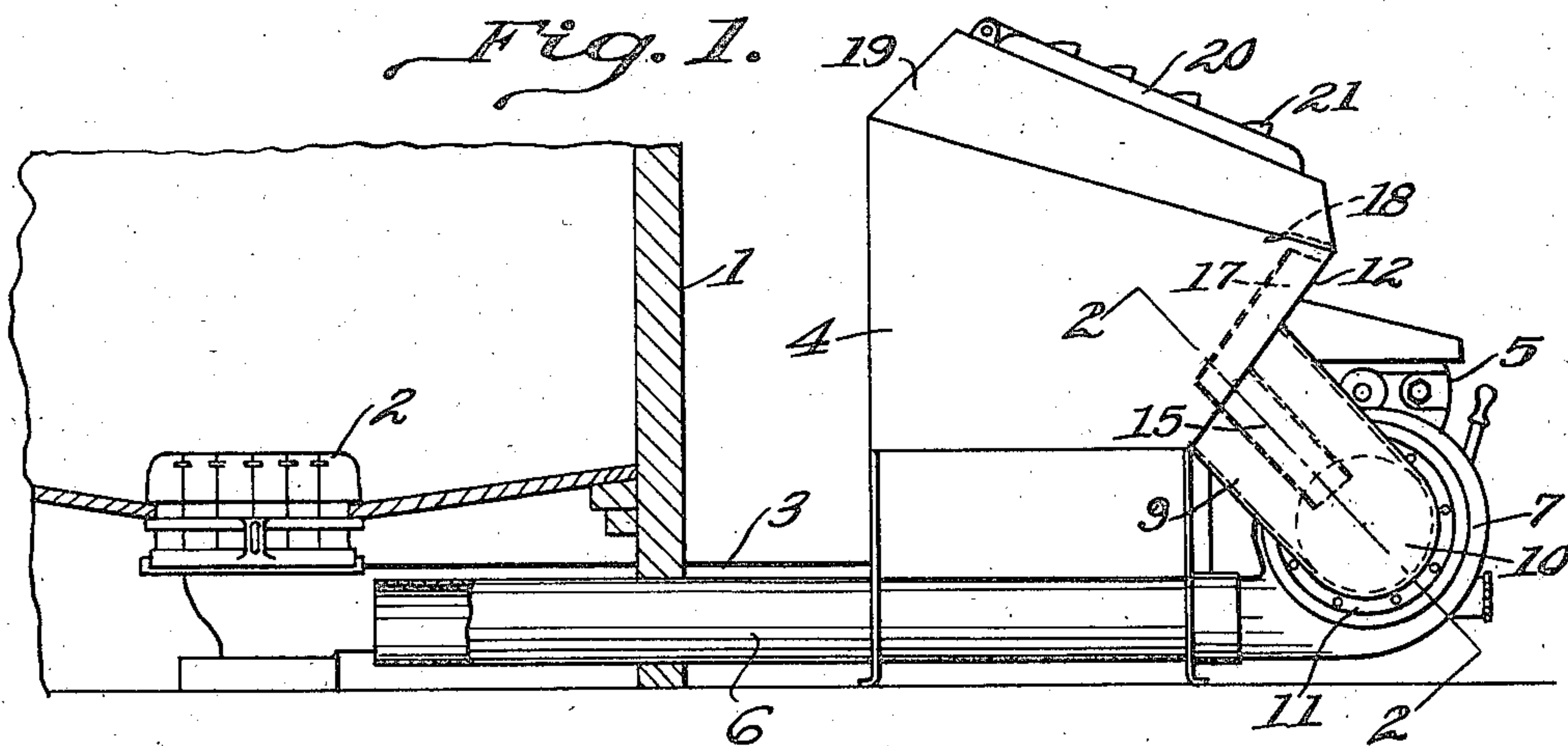
Aug. 20, 1935.

H. B. DONLEY

2,011,852

COAL BURNING STOKER

Filed Dec. 31, 1932



Inventor
H. B. Donley

By

H. S. M. Lowell
Attorney

UNITED STATES PATENT OFFICE

2,011,852

COAL BURNING STOKER

Harold B. Donley, Columbus, Ohio, assignor to
Columbus Metal Products Inc., Columbus, Ohio,
a corporation of Ohio

Application December 31, 1932, Serial No. 649,716

2 Claims. (Cl. 110—45)

This invention relates to coal stokers for domestic furnaces and is particularly directed to that type known as under feed stokers employing crushed or pulverized fuel which is deposited in a hopper and fed upwardly into a retort positioned within the furnace.

The primary object of the invention is to provide means whereby should the stoker gas or dust back through the fuel hopper such gas or dust will be withdrawn from the hopper, before having a chance of escaping into the furnace room.

Another object of the invention is to make use of the blower, employed in connection with the stoker, for withdrawing the gas or dust which may find its way back through the stoker mechanism or the fuel therein.

A further object is to provide a perforated closure for the hopper with a conduit in connection therewith leading to the inlet side of the blower for creating a slight suction or air current across the hopper for withdrawing any gas or dust laden air which may be within the hopper and to convey the air to the blower from where it is blown into the furnace or heating apparatus.

In my prior Patent No. 1,954,072, granted April 10, 1934, there is shown an arrangement wherein the driving mechanism, blower and the fuel hopper are all positioned within a housing having a perforated top wall constituting the air inlet for the blower. Although this arrangement is highly practical from an operating standpoint, the addition of the housing adds cost as well as size to the apparatus which, in some cases meets with certain objections and particularly from a sales standpoint. It is therefore also an object of the present invention to reduce the cost of the apparatus by the elimination of the housing above referred to but yet retain the practical feature of having the blower serve as means for withdrawing the objectionable gases which may be present in the fuel hopper.

For a further understanding of the invention, reference is to be had to the following description and the accompanying drawing, wherein:

Fig. 1 is a vertical sectional view of a portion of a furnace showing the stoker comprising the present invention operatively connected therewith;

Fig. 2 is a detail sectional view taken on the line 2—2 of Fig. 1;

Fig. 3 is a similar view taken on the line 3—3 of Fig. 2.

Referring more particularly to the drawing, the numeral 1 designates the usual form of furnace in which is positioned the retort 2 through which

fuel is fed upwardly from the fuel conveying conduit 3 connecting the fuel hopper 4. The feeding of the fuel through the conduit may be accomplished by such means as a screw conveyor (not shown) positioned longitudinally of the conduit and driven by a motor mechanism 5 arranged exterior of the furnace and hopper. For delivering air to the retort during the operation of the stoker, an air duct 6 is provided through which the air is forced by a blower unit 7 also driven by the motor mechanism 5. As the particular form of retort, conveyor and motor mechanism is not a part of this invention, such parts are only referred to in a general manner.

Due to the fact that the blower during its operation builds up a slight pressure head within the combustion zone of the furnace, gases and air have a tendency at times to flow backwardly through the fuel conduit and into the hopper from which it may find its exit into the furnace room. To overcome this objectionable condition, the blower unit 7 is provided adjacent its inlet 8 with a shallow pan-like shield 9 which is diagonally arranged and has its lower rounded end 10 closed and formed with a flange 11 secured in any convenient manner to the blower casing. This shield which is of a length greater than the diameter of the blower inlet 8 and has its upper end attached to the front wall 12 of the hopper, has its side wall 13 spaced from the inlet opening 8 of the blower to provide an air receiving space 14, which is open at its upper end so that air may enter therein and be directed to the inlet side of the blower. Carried by the shield and arranged upon the side of the wall 13 is a duct 15 which extends longitudinally of the shield and has its upper end attached to the wall 12 and in registration with an opening 16 formed therein which opening is also in communication with a branch duct 17 formed with a corner of the hopper. The duct branches 15 and 17 form a continuous conduit having its lower end positioned adjacent the inlet 8 of the blower and its upper end terminating at a point approximately even with the top of the fuel receiving chamber of the hopper. Overlying the upper end of the duct branch 17 and spaced a distance above the same is a plate 18 which serves to keep coal particles from falling into the duct during the filling of the hopper and which due to its spaced position from the duct provides an inlet therefor which opens inwardly towards the interior of the hopper.

Closing the upper end of the hopper is a hood 19 having a hinged lid 20 carried by its upper

wall covering the filling opening formed therein. The lid 20 is formed with louvers 21 providing openings or entrances for air into the hopper.

By this arrangement, it will be seen that when the stoker is in operation, with the blower unit running, the major portion of the air for the blower will be drawn through the open end of the intake provided by the shield 9. This will create an induced draft in the duct branches 15 and 17 and cause a slight air current through the louvers 21 and across the fuel body in the hopper which air current will serve to withdraw any gas or dust present in the fuel hopper and prevent the same from finding its exit into the furnace room. As the blower receives its major air supply exterior of the hopper, the induced air draft interior and across the top of the hopper is therefore slight and no suction is created upon the fuel body. However this weak air current is of sufficient strength to carry with it gas or dust present above the fuel body and direct the same to the blower from where it will be forced into the combustion zone of the furnace.

What is claimed is:

1. In automatic stoker mechanism, a retort, a motor-driven blower provided with an air intake opening in the side wall of its casing, a fuel hopper having an open top for the reception of solid fuel, a conduit for transferring fuel from the lower portion of said hopper to said retort, a vented closure for the open top of said hopper, an open-ended shield communicating at its lower end with the air intake of said blower and having its open upper end terminated contiguous to said hopper, a conduit disposed internally of said hopper, said conduit being open at its upper end to com-

municate with the space normally present between the fuel contained within the hopper and said closure, and a second conduit joined with the lower end of the first conduit and extending in angular relation with respect thereto, said second conduit being disposed within the confines of said shield and having its lower end terminated adjacent to the air intake opening of said blower, whereby during the operation of said blower, the passage of air through said shield will produce a mild induced draft in said conduits to withdraw volatiles from the upper region of said hopper.

2. In automatic stoker mechanism, a retort, a motor-driven blower provided with an air intake opening in the side wall of its casing, a fuel hopper having an open top for the reception of solid fuel, a conduit for transferring the fuel from the lower portion of said hopper to said retort, a vented closure for the open top of said hopper, an open-ended shield communicating at its lower end with the air intake of said blower and having its open upper end terminated contiguous to said hopper, a conduit open at its upper end to communicate with the space normally present between the fuel contained within the hopper and said closure, and a second conduit joined with the lower end of the first conduit and extending in angular relation with respect thereto, said second conduit being disposed within the confines of said shield and having its lower end terminated adjacent to the air intake opening of said blower, whereby during the operation of said blower, the passage of air through said shield will produce a mild induced draft in said conduits to withdraw volatiles from the upper region of said hopper.

HAROLD B. DONLEY.