

Dec. 10, 1929.

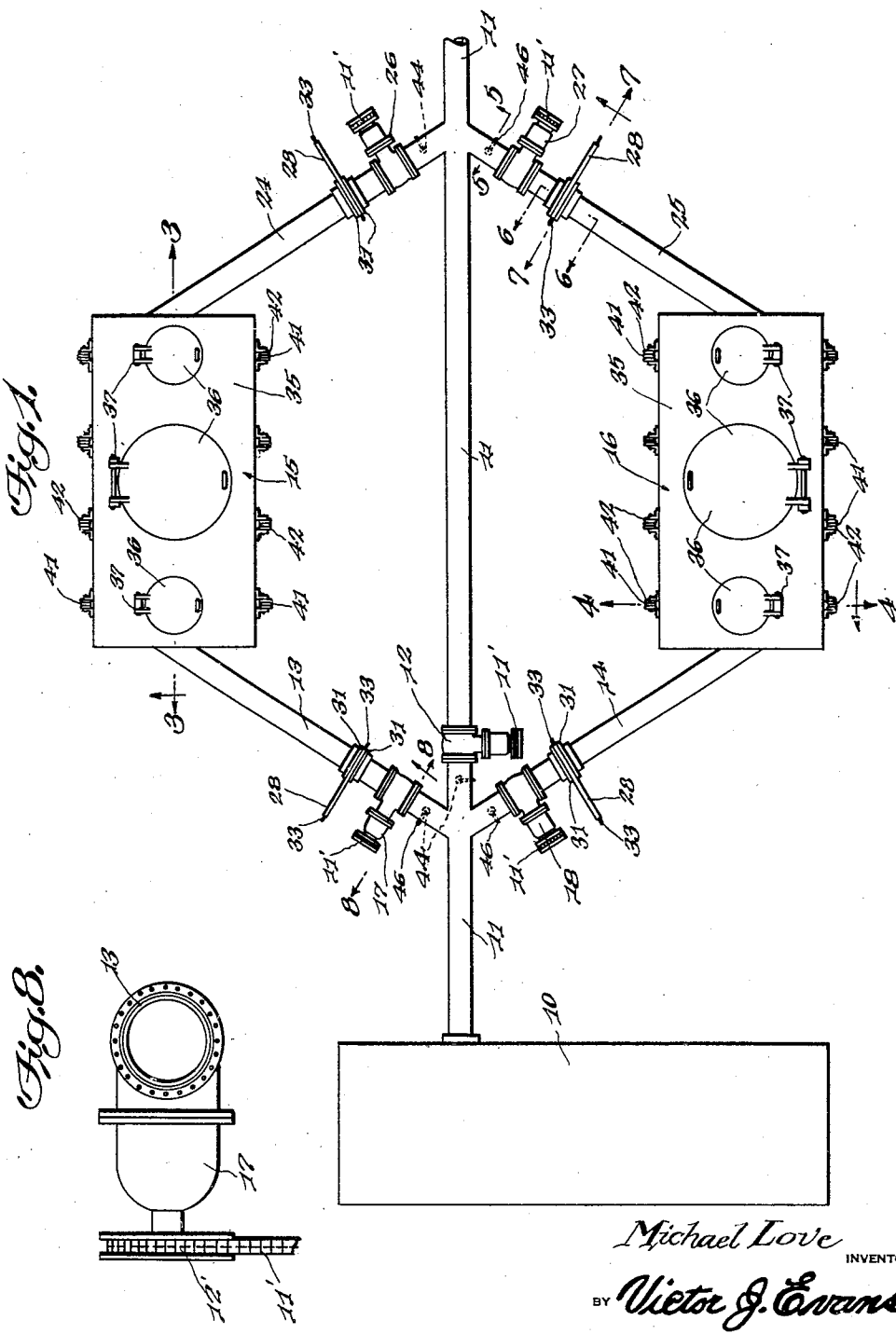
M. LOVE

1,739,367

DUST TRAP

Filed Nov. 11, 1925

2 Sheets-Sheet 1



Michael Love
INVENTOR
BY Victor J. Evans
ATTORNEY

Dec. 10, 1929.

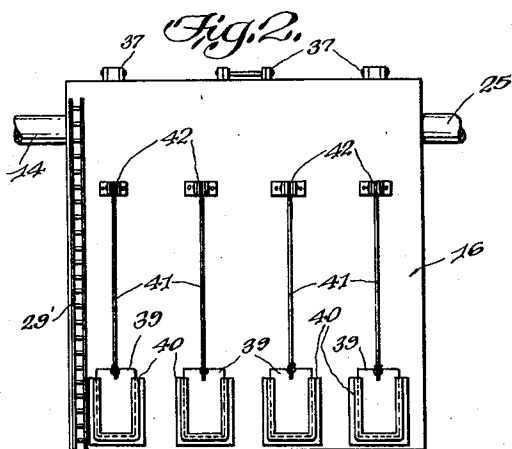
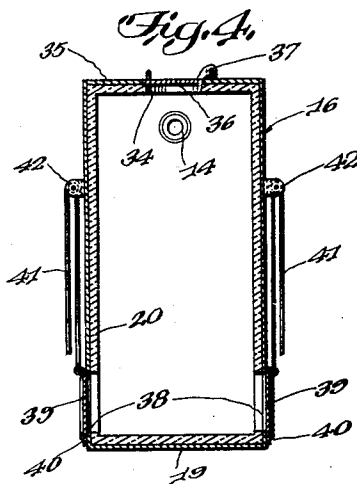
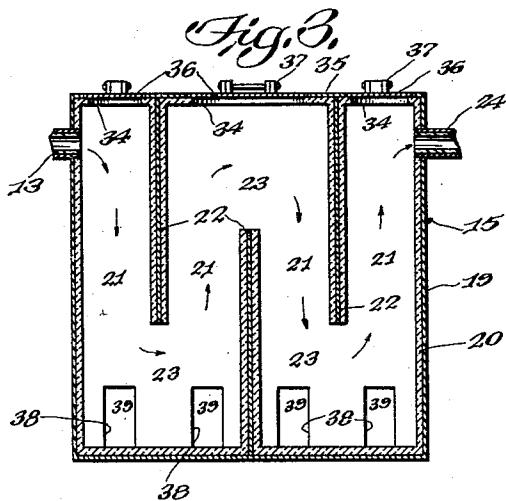
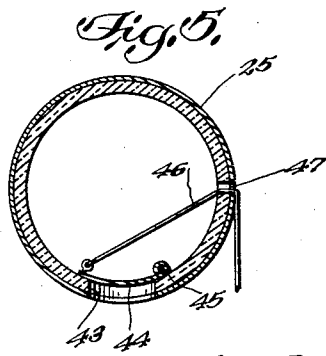
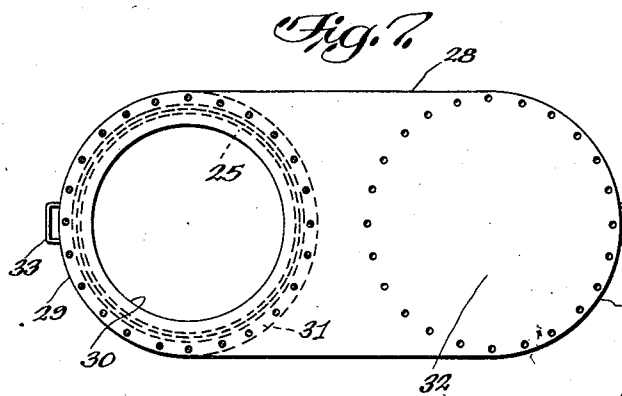
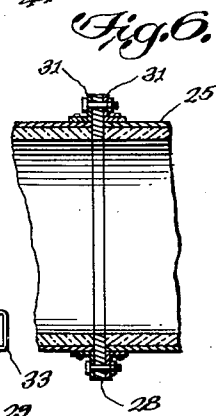
M. LOVE

1,739,367

DUST TRAP

Filed Nov. 11, 1925

2 Sheets-Sheet 2



Michael Love

INVENTOR

BY Victor J. Evans

ATTORNEY

UNITED STATES PATENT OFFICE

MICHAEL LOVE, OF PITTSBURGH, PENNSYLVANIA

DUST TRAP

Application filed November 11, 1925. Serial No. 63,390.

This invention relates to new and useful improvements in dust traps and has for its principal object the provision of an improved construction of this character which will be highly efficient in use and economical in manufacture.

Among the salient objects of the invention is the provision of a device of this character arranged and adapted to trap flue dust and other foreign particles of matter which would, if not trapped, be carried with the gas from the blast furnace to the boiler such as is generally used in foundries and steel works.

A further object of the invention is the provision of a dust trap, the construction of which is such that the removal of dust trapped therein can be conveniently made and interior or exterior repairs can be made at an economical cost, with safety to the workers, and without discontinuing the flow of gas to the boilers.

A further object of the invention is the provision of a pair of dust traps of the character to be hereinafter described which are in communication with a blast furnace and boiler in such manner that one or both of the traps can be shut off for the purpose of making repairs or for removing the dust and other particles therefrom.

Other objects will appear hereinafter.

The invention consists in the combination and arrangement of parts hereinafter described.

The invention will be best understood by reference to the accompanying drawings showing the preferred form of construction and in which:

Fig. 1 is a top plan view of the invention showing the preferred form of construction.

Fig. 2 is a side elevational view of one of the dust traps embodied in the invention.

Fig. 3 is a vertical sectional view taken substantially on line 3—3 of Fig. 1.

Fig. 4 is a vertical sectional view taken substantially on line 4—4 of Fig. 1.

Fig. 5 is a sectional view taken substantially on line 5—5 of Fig. 1.

Fig. 6 is a fragmentary sectional view taken substantially on line 6—6 of Fig. 1.

Fig. 7 is a side elevational view of one of

the shut-off plates taken substantially on line 7—7 of Fig. 1.

Fig. 8 is a detail view taken substantially on line 8—8 of Fig. 1.

Referring to the drawings illustrating the preferred form of construction, 10 indicates a blast furnace of the type employed in steel mills which is in communication with boilers (not shown) by means of a conductor pipe 11 through which gas from the blast furnace passes to boilers and passage through the conductor pipe is controlled by a gate valve 12, of an approved type, which in turn is manually controlled by a sprocket chain 11' passing over a sprocket wheel 12'. Communicating with the conductor pipe 11, rearwardly of the gate valve 12, are branch conductor pipes 13 and 14 which have communication with traps 15 and 16 respectively and passage through these pipes is likewise controlled by gate valves 17 and 18. This arrangement is such that the gas flowing from the blast furnace can be diverted through either of the pipes 13 or 14 into the trap communicating with the pipe through which the gas is flowing, by closing the gate valve 12 and the gate valve of the branch pipe through which passage is to be shut off.

The conductor pipes and the traps, as best illustrated in Figs. 2 to 4 inclusive, are preferably constructed of an outer casing 19 formed of metallic material and lined with a non-combustible material as indicated at 20, the non-combustible material protecting the outer casing from the heat and chemicals of the gas.

As illustrated the traps are provided with a number of spaced baffle plates 22 forming a zig-zag passage 23 through each of the traps and these baffle plates are preferably lined with non-combustible material to protect the metallic material from which they are formed from the heat and chemical acids of the gas. The gas entering the traps from the conductor pipes 13 and 14 is diverted in a zig-zag course through the traps and during passage thereof the baffle plates intercede and arrest dust and deposit the same within the traps. The clean gas continues its course through exit branch conductor pipes 24 and 25 which

have communication with conductor pipe 11 forwardly of the gate valve 12 and passage through the branch conductor pipes is controlled by gate valves 26 and 27 similar in type to the gate valves herein mentioned.

The operation of the device thus far described is such that gas flowing from the blast furnace at low pressure, may have direct communication with boilers (not shown) through the conductor pipe 11 or through either of the traps 15 and 16 when at a higher pressure, this being accomplished by closing the necessary valves so as to divert the gas to the particular trap desired.

In addition to the branch pipe gate valves, which are employed for the purpose of closing the passage through these pipes, I also provide shut off plates 28 which are oblong in shape with semi-circular ends 29 and these shut off plates are ordinarily used to close the passage through the conductor pipes leading to the traps when the traps are not in use during cleaning or repairing. As shown in Fig. 7, a circular opening 30 is formed in one portion of each of the shut off plates 28 and this opening, when the shut off plates 28 are mounted to permit passage through the branch pipe with which used, is in registration with the passage of that branch pipe and when mounted in this position the shut off plate is bolted to flanges 31 carried by the conductor pipe. When it is desired to close the passage through this pipe, by means of the shut-off plate, the bolts are removed from the same and the shut off plate shifted so as to bring the solid portion 32 in closing position, thus cutting off communication through the conductor pipe. As shown in Fig. 7, handles 33 are provided on each of the shut off plates to afford manual manipulation.

Provision is provided to gain access to the interior of the traps for the purpose of removing the accumulated dust or for the purpose of making repairs. To permit this removal, man-holes 34 are formed in the top walls 35 of the dust traps and are normally closed by covers 36 hingedly mounted as at 37, there being a ladder 29' provided affording means of reaching the covers 36. Openings 38 formed in the side walls of the traps are also provided for the above purpose and these openings are normally closed by doors 39 slidably mounted in guide ways 40 and are manipulated by cables 41 extending over a pulley 42 as best shown in Fig. 4. I also provide openings 43 in the conductor pipes, as best shown in Figs. 1 and 5 for removing accumulated dust from these pipes and these openings are normally closed by drop doors 44 hingedly mounted as at 45 and manipulated by means of a cable 46 extending through openings 47 as shown in Fig. 5.

An object of the invention as herein stated, is to trap the dust and other foreign particles of matter travelling with the gas

from a blast furnace to a boiler and to accomplish this object I have, as will be apparent from the foregoing description, provided traps and other means whereby the flow of gas need not be discontinued when one or both of the traps are to be shut off from communication with the blast furnace and boiler, as it will be noted that the flow of gas is manually controlled and may flow through either of the conductor pipes 11, 13 or 14. When the gas flows through either of the conductor pipes 13 or 14 it is diverted into the trap in communication with that particular conductor pipe and as the gas passes through the trap particles of dust and other foreign matter carried therewith are interceded and arrested by the baffle plates and trapped within the traps leaving the gas to find exit through the exit conductor pipes free from the usual dust and other foreign particles of matter.

The invention having been set forth, what I claim as new and useful is:—

1. In a device of the class described, a main conduit having pairs of branch conduits extending therefrom at spaced apart points whereby an intermediate portion is defined in said main conduit, said branch conduits extending from said main conduit at acute angles to the intermediate portion thereof, dust traps, conduits leading to said dust traps adapted to be connected to said branch conduits, and valve means in said branch conduits and in the intermediate portion of said main conduit adapted to be opened or closed in predetermined arrangements whereby to regulate passage through or past said dust traps.

2. In a device of the class described, a main conduit having pairs of branch conduits extending therefrom at spaced apart points whereby an intermediate portion is defined in said main conduit, said branch conduits extending from said main conduit at acute angles to the intermediate portion thereof, dust traps, conduits extending from said dust traps adapted to be connected to said branch conduits, valve means in said branch conduits, valve means in the intermediate portion of said main conduit, and means in said conduits leading to said dust traps adapted to be arranged such that said dust traps may be permanently closed against passage from said main conduit therinto and therefrom at predetermined times.

In testimony whereof I affix my signature.
MICHAEL LOVE.