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Patented Sept. 25, 1900.

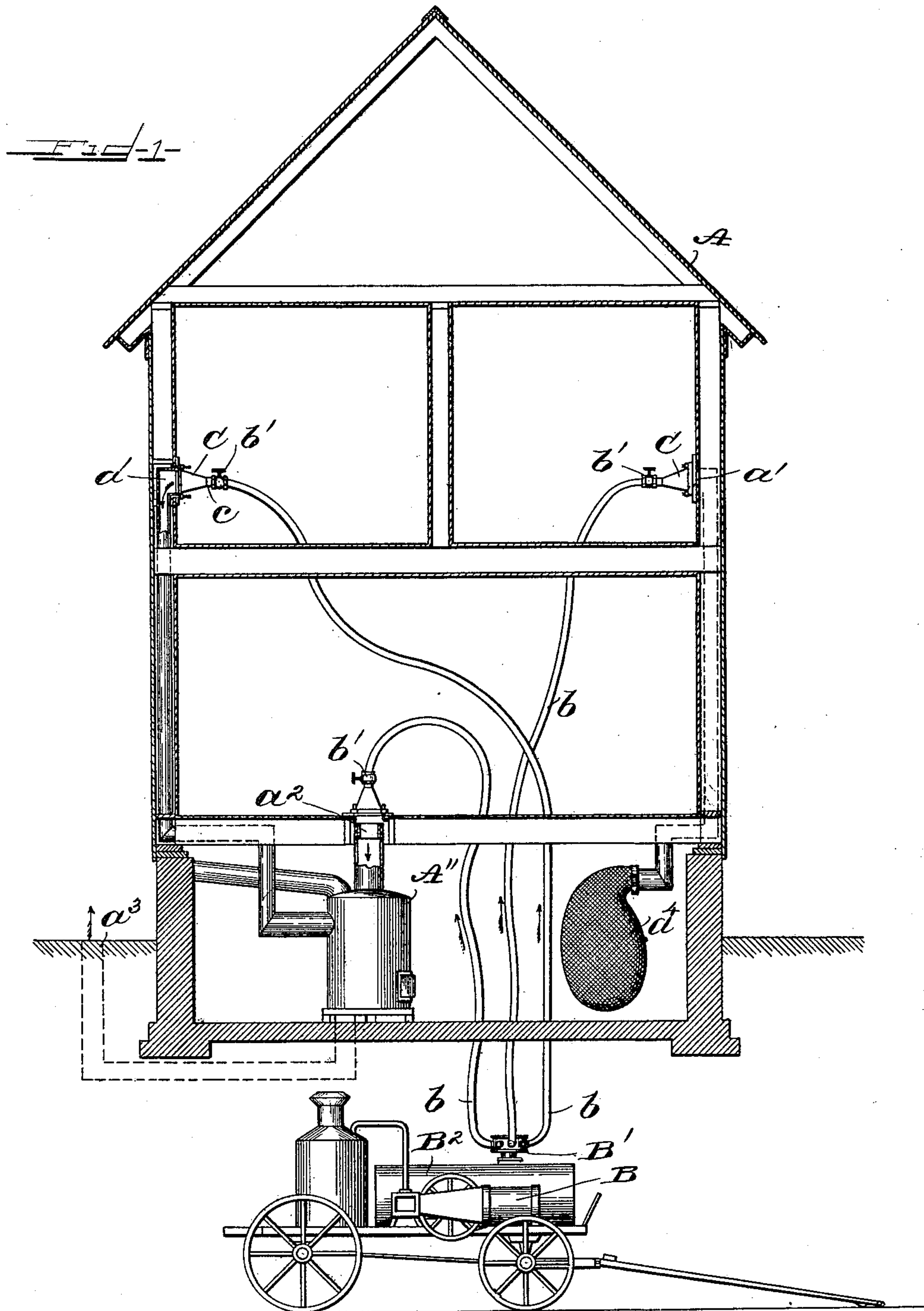
W. T. VAN DORN.

MEANS FOR CLEANING FLUES FOR FURNACES OR THE LIKE.

(Application filed May 14, 1900.)

(No Model.)

2 Sheets—Sheet 1.



Witnesses
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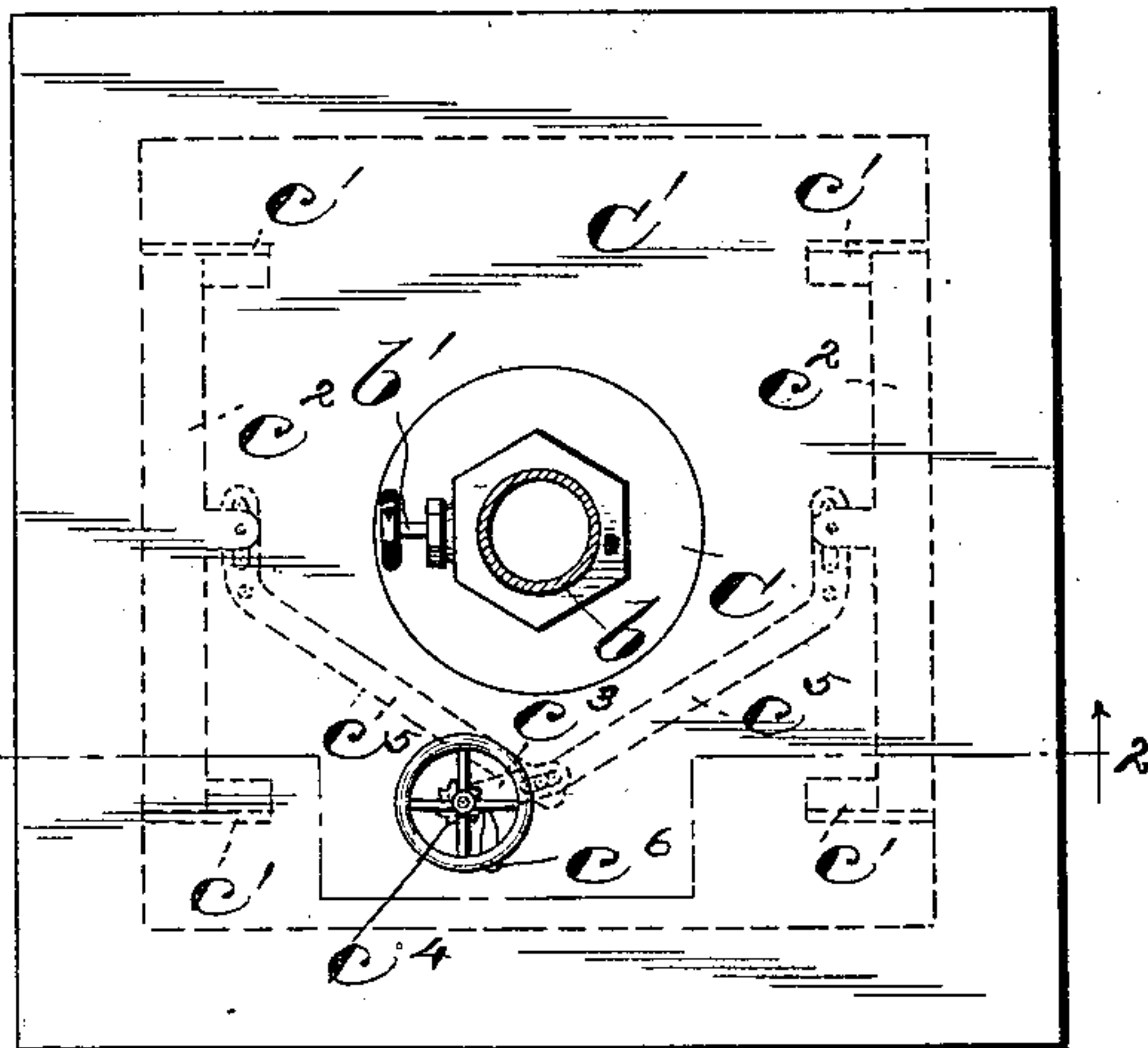
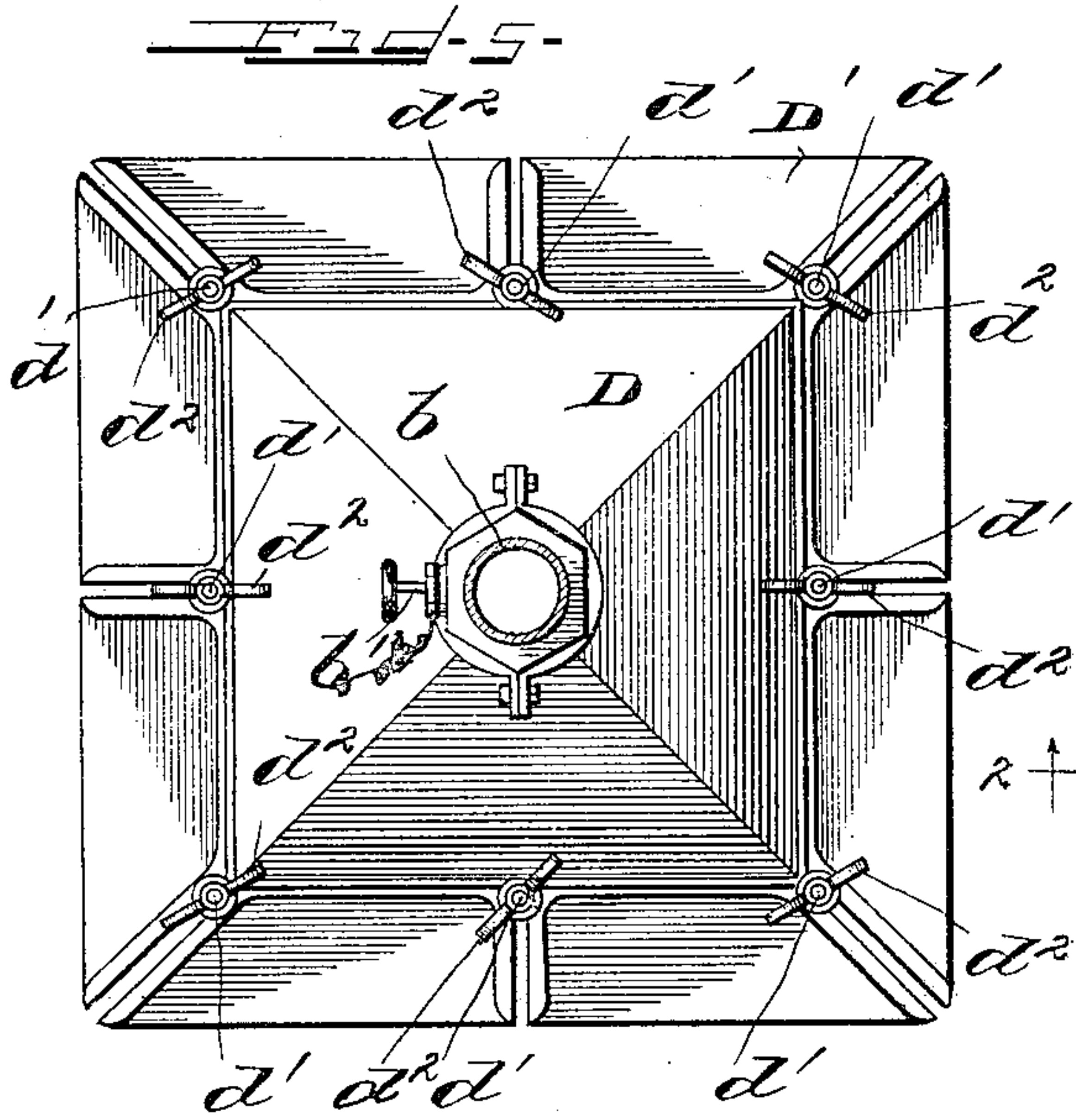
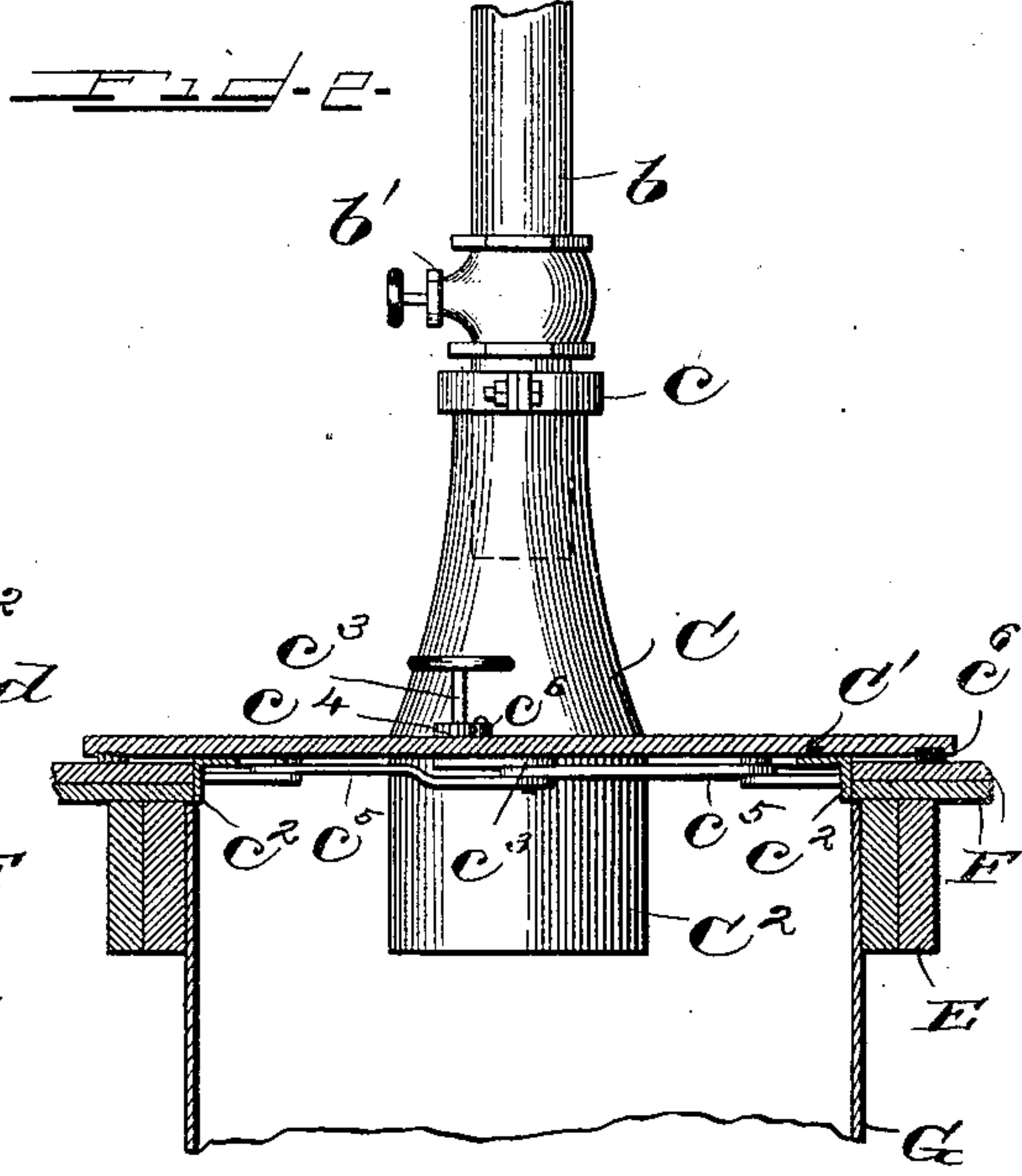
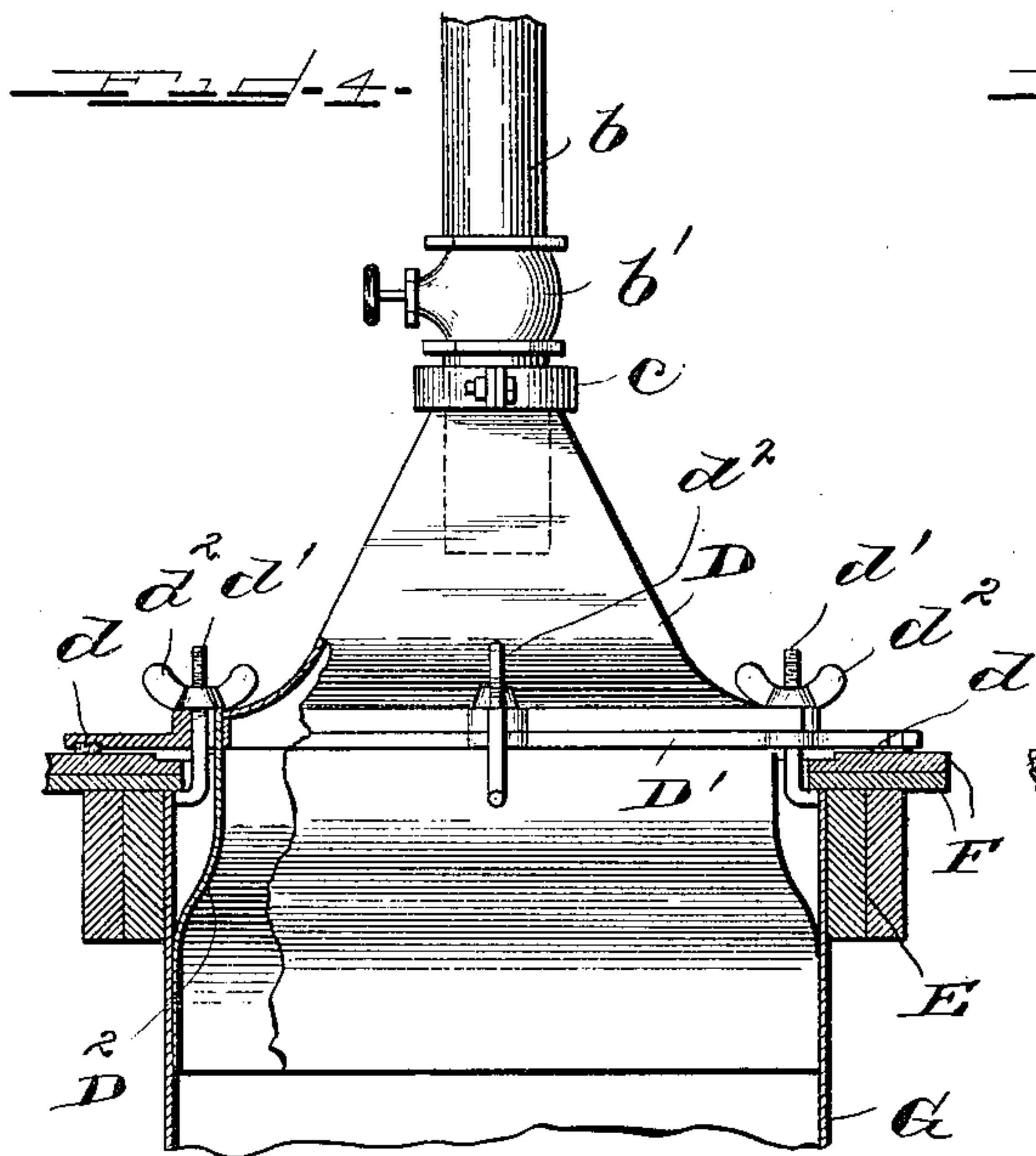
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Witnesses

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UNITED STATES PATENT OFFICE.

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MEANS FOR CLEANING FLUES FOR FURNACES OR THE LIKE.

SPECIFICATION forming part of Letters Patent No. 658,477, dated September 25, 1900.

Application filed May 14, 1900. Serial No. 16,578. (No model.)

To all whom it may concern:

Be it known that I, WILLIAM T. VAN DORN, a citizen of the United States, residing at Chicago, in the county of Cook and State of Illinois, have invented a new and useful Improvement in Means for Cleaning Flues for Furnaces or the Like, of which the following is a full, clear, and exact description, reference being had to the accompanying drawings, and the letters of reference marked thereon, which form a part of this specification.

This invention relates to improvements in means for cleaning flues of furnaces and the like of that class ordinarily employed for heating purposes.

A furnace of any desired construction is ordinarily located in a basement and flue-pipes lead therefrom upwardly through the partitions and side walls of the building to the rooms desired to be heated and open into said rooms by means of apertures provided with registers of any desired form. Ordinarily the registers are located in the floor or in the side wall or in a partition and in close proximity to the floor and adapted to receive therein dust, dirt, or refuse of various kinds which is swept or falls through the register into the flue-pipes. It is a matter of common experience that when the furnace is in operation, thereby causing a strong ascending current of hot air through said flue-pipes, considerable quantities of dust from such refuse is carried upwardly to discolor the walls and render the atmosphere within the room unfit for respiration. Not only is this the case, but it frequently occurs that during the portion of the season when the furnace is not in use organic matter finds its way into the flue-pipe through the carelessness of servants or of children and decomposing thereby endangers the health of inhabitants of the entire building. Obviously from the location of said furnace-flues the same are comparatively difficult of access and it is frequently impossible to clean the same by the ordinary methods. My invention contemplates a pneumatic means for removing all foreign matter from said flues in a minimum of time and with a minimum of expense and inconvenience.

The invention consists of the matters here-

inafter described, and more fully pointed out and defined in the appended claims.

In the drawings, Figure 1 is a vertical cross-section of a building provided with such heating means and illustrates one means of embodying my invention. Fig. 2 is a view in vertical section of a device adapted to afford air-tight connection between said flue and the pressure-reservoirs. Fig. 3 is a top plan view of the same. Fig. 4 is a view similar to Fig. 2 and illustrates another means for securing air-tight connection between a flue and an air-pressure tank. Fig. 5 is a top plan view of the same.

As shown in the drawings, A indicates a building of any desired form or construction provided with registers, some of which, as herein shown, are located in the floor and some in the side walls of the building. Said registers are connected by means of hot-air flues with the furnace A' in any desired manner. Said hot-air flues located in the walls are indicated by a' and those downwardly through the floor are indicated by a^2 .

a^3 indicates the cold-air duct leading inwardly to the lower part of the furnace from outside the building and adapted to furnish fresh air thereto in a familiar manner.

B indicates an air-compressing pump of any desired construction, and B^2 a tank to receive the air under pressure from the pump. As herein shown, said pump and tank are mounted upon a carriage or truck to adapt the same to be moved along the street.

B' indicates a head connected with the compression-chamber of said pump or said tank and provided with a plurality of nipples adapted to afford air-tight connection with the hose-pipes b b and adapted when not connected with said hose-pipes to be closed in a familiar manner by shut-off cocks or caps to prevent the escape of air therefrom. Said hose-pipes b b , each provided with a valved nozzle b' , are adapted to be led into the doors and windows of a building.

For the purpose of forming the connection with the heat-flue a pneumatic hood is provided, adapted to be rigidly secured to the nozzle b' of the hose. Said pneumatic hood or fitting, as herein shown, comprises a rigid plate C', of metal or the like, provided with

a central aperture and having dimensions greater than the open end of the heat-flue and adapted to form a closure therefor. Said plate is provided on its under side with
 5 a pad or band of rubber extending around the same and adapted to prevent the escape of air between said plate and the floor or wall. On the upper side said plate is provided with a conical casing or shell C, which
 10 extends through said plate, forming an air-tight joint therewith. Said casing is provided at its upper end with a collar c, adapted to form an air-tight joint with the end of the hose-nozzle. Obviously the register being removed from the flue and said plate C'
 15 being laid over the open end thereof the weight of a man standing thereon will ordinarily be sufficient to hold the same in close contact with the floor, entirely closing the
 20 upper end of the flue-pipe when the air is turned on. For use, however, with large registers means are provided for clamping said hood rigidly within the end of the flue-pipe, as follows: Said plate C' is provided on
 25 the under side thereof on opposite sides with the depending guide-flanges c' c', parallel with each other and adapted to form ways for oppositely-moving clamping-bars c² c², located on each side of the plate parallel with
 30 the edge thereof, and the ends of which are engaged in said flanges c' c'. Means are provided for moving said clamping-bars oppositely or into and out of engagement with the edges of the floor surrounding said flue-aperture or with the joists on each side of said
 35 aperture, as follows: A shaft C³ is provided, the lower end of which passes through said plate C' and is provided with a suitable stuffing-box. The upper end of said shaft extends above the plate and is provided with a
 40 hand-wheel for rotating the shaft. A ratchet-wheel c⁴ is provided adjacent to said plate C' on the upper side thereof, and a suitable pawl is pivoted to said plate adjacent thereto
 45 in position to engage the teeth of the same to hold said shaft from rotation in one direction. The lower end of said shaft is provided with an arm c³, extending at right angles with said shaft and provided with a stud or
 50 pivot-pin having pivotal engagement with the toggle-bars c⁵ c⁵, the outer slotted ends of which are secured, respectively, to a central lug on each clamping-bar c² c² by means of a pivot-pin secured in each lug. The point
 55 of engagement of said toggle-bars with said clamping-bars is out of alinement with the shaft C³, so that the rotation of said shaft C³ in one direction forces said clamping-bars oppositely and outwardly into clamping engagement with the joists or with the margin
 60 of the floor at the sides of said flue-aperture. Rotation in the opposite direction tends to withdraw said clamping-bars from such engagement, thereby permitting said hood to
 65 be removed from over the flue.

The form of hood illustrated in Figs. 4 and 5 is similar to that heretofore described with

the exception of the means for engaging or locking the same within the flue-aperture. In this form of my device the plate D' is in
 70 most respects similar to the plate C', but is provided at the corners and in each margin with a plurality of radial slots. A pad or
 75 band d of suitable packing material, such as rubber or the like, is provided around the margin of the plate on its under side to afford close contact with the floor, as before described. Bolts d', provided with hooked ends
 80 or heads, extend downwardly through said slots and are adapted to engage the under edge of the floor and to be clamped thereto by means of winged nuts d², having screw-threaded engagement with the outer ends of
 85 said bolts and bearing against the upper side of the plate. Said plate is provided with a casing D, similar to the casing C, adapted to form air-tight connection with the nozzle of the hose and with said plate. Secured on the
 90 under side of the plate B' and depending therefrom is a sheet of flexible material impervious to air, such as rubber sheeting or like material, which extends entirely around the aperture in said plate and is adapted when the same is secured to the outer end of
 95 the flue to depend within the same and to be forced by the pressure of the air from said hose into close contact with the sides thereof, thereby preventing the escape of the air upwardly through said slots of the plate. Obviously, if desired, such a sheet or tube of
 100 flexible material may be provided beneath the plate C'. Ordinarily, however, the same will not be necessary, inasmuch as it is designed to construct the same with no means for escape of the air between the same and
 105 the floor.

The operation of my device is as follows: Suitable air-compressing means, preferably supported upon a vehicle to admit of the same
 110 being transported along the street, will be provided with a plurality of air-tight hose-pipes, as shown. A plurality of hoods of different sizes will be carried on said vehicle, adapted to be attached to the free ends of
 115 hose-pipes, as described. The registers of the flues of a building on either side of the street being removed, the lower ends of the hoods are secured in the flue-openings, as before described. The valve b' may then be
 120 opened, and air under any pressure will be forced into said flue, the greatest force thereof being directed centrally and downwardly at the point where normally is found the greatest accumulations of refuse. Said jet
 125 of air forces said refuse along said flue and if the same has not been disconnected from the furnace will force all accumulations of dust and dirt outwardly from the same through the cold-air duct, (herein indicated as
 130 a³), thereby effectually cleaning the same. If for any reason it is undesirable to force the refuse, dirt, or other material outwardly through said cold-air duct, the flue-pipe may be disconnected from the furnace, and a re-

ceptacle or sack a^4 , of fine wire, gauze, or burlap, or other loosely-reticulated structure may be secured to the lower end of the flue to catch the refuse matter, while permitting the free escape of the air therefrom. Ordinarily it will be preferable to permit one or more of said flue-pipes to remain connected with the furnace to insure that all accumulations of dust, dirt, or other undesirable matter be forced out of the same.

A device embodying my invention may be constructed with any desired number of hose-pipes, may be of any desired form, and may be adapted to be transported by a vehicle of any construction—if preferred, an automobile vehicle, the propelling means of which may also serve to actuate the air-compressor. The apparatus being conducted down the street, the buildings on both sides of the street may be cleaned at one and the same time, if preferred, or, if desired, all the flues of a building may be connected at one and the same time with said air-compressor by the means described and thoroughly cleaned. The air-pressure remaining permanently on said hose-pipes, it requires but a moment to connect them with the hood and secure the same in the flue and at the proper time open the valve in the nozzle, force the strong current of air therethrough, thus insuring that the said flues and the furnace be effectually cleaned in a minimum of time and with a minimum of expense and inconvenience to the householder.

I claim as my invention—

1. In a device of the class described the combination with an air-pump of a detachable hood, adapted to seal or close the open end of a furnace-flue and provided on its inner side with a tube extending within the flue; a tube connecting the air-pump with said hood and inner tube, and a regulating-valve adapted to be operated at the hood whereby air under a desired pressure may be admitted to the flue, thereby carrying outwardly refuse matter therein contained.

2. In a device of the class described an air-compressing pump provided with means for connecting a plurality of hose therewith, a removable hood on the free end of each hose adapted to be secured in the open end of a furnace-flue, laterally-movable clamping means supported on said hood whereby the same may be secured within said flue and a regulating-valve in the hose adjacent to said hood whereby air may be excluded from the hood or admitted therethrough under a desired pressure.

3. A hood for the purpose specified comprising a plate of sufficient size to cover a heat-flue, a pad of packing surrounding said plate on the under side of the margin thereof, means for clamping said plate within said flue, said plate being provided with a central aperture, a casing secured to the plate and surrounding said aperture and having air-tight connection with a hose-nozzle and

clamping means supported on said plate whereby the same may be rigidly secured within the open end of the flue.

4. In a device of the class described, a hood comprising a plate of metal or the like having dimensions greater than a flue-opening and provided on the under side thereof with a resilient pad adapted to form a tight joint around the flue, and an aperture extending through said plate, an air-tight casing surrounding said aperture on the outer side, and extending upwardly therefrom, means at the upper extremity thereof adapted to form air-tight connection with the nozzle of a hose, and means supported on said plate adapted to afford locking engagement thereof with parts surrounding said flue end, said locking mechanism being adapted for lateral adjustment to permit said hood to be used for flues of different sizes.

5. A hood comprising a casing adapted to have air-tight connection with the nozzle of a hose or the like and provided at its lower end with an apertured plate at approximately right angles with the axis thereof said plate being of sufficient dimensions to cover the discharge end of a furnace-flue, laterally-movable clamping means supported on said plate and adapted to engage on each side of the flue and a depending band or strip surrounding the aperture in said plate and adapted to extend within the flue.

6. In a device of the class described, a hood comprising a casing adapted to have air-tight connection with a nozzle of a hose or the like and provided at its lower end with an apertured plate at right angles with the axis thereof, said plate being of sufficient dimensions to cover the discharge end of a furnace heat-flue, oppositely-moving parallel clamping-bars supported on the under side of said plate on each side of the aperture thereof and adapted to be moved laterally to engage on each side of the flue end, toggle-bars engaging centrally with their opposite ends said clamping-bars and engaging with their adjacent ends a pivot-pin, and means for moving said inner ends outwardly or inwardly, thereby forcing said clamping-bars into or out of engagement at the sides of the flue.

7. In a device of the class described, a plate provided with a central aperture and provided on the under side thereof with a marginal pad or band of resilient material, a casing surrounding said central aperture and provided at its upper ends with means for attachment to a nozzle, a band or strip surrounding the aperture in and depending from said plate and adjacent to said aperture, a rotative shaft passing through said plate provided on its upper ends with a hand-wheel and a ratchet, a pawl pivoted on said plate adapted to engage said ratchet, and to resist rotation of said shaft in one direction, the lower end of said shaft being provided with a laterally-directed arm, a stud on said arm,

oppositely-directed toggle-bars pivoted on said stud and engaging with their outer ends clamping-bars on opposite sides of said plate, adapted to be moved by the rotation of said shaft into and out of engagement at the sides of a heat-flue or the like.

8. In a device of the class described the combination with an air-pump, of a detachable hood provided on its under side with a resilient pad and adapted to seal or close the open end of a furnace-flue, a tube secured on the under side of said hood and extending into the flue, a tube connecting the air-pump and said hood whereby air may be admitted into the flue through said hood and tube, thereby carrying outwardly refuse matter therein contained.

9. In a device of the class described the combination with an air-compressing pump of a detachable hood adapted to seal or close the open end of a furnace-flue and provided on its under side with a tube extending into the flue, a tube connecting the air-pump and said hood and provided with a regulating-valve adapted to be operated at the hood, and clamping means on said hood adapted to secure the same in the flue end.

In testimony whereof I hereunto subscribe my name in the presence of two witnesses.

WILLIAM T. VAN DORN.

In presence of—

CHARLES W. HILLS,
LOUIS J. DELSON.