

1,015,372.

4 SHEETS—SHEET 1.



James Hutchinson:
Calvin G. Milam.

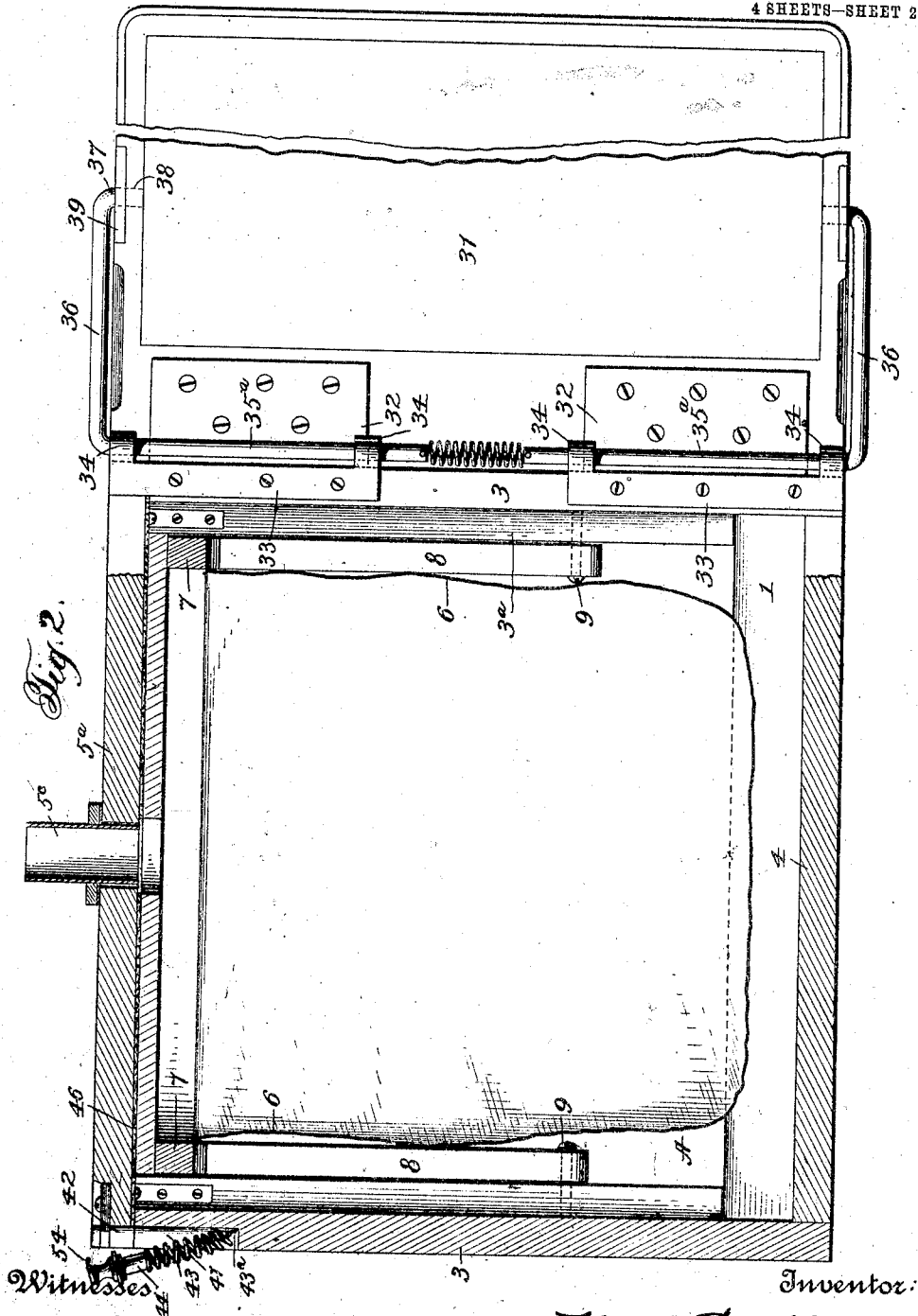
Morris S. Wright,
by Yacovlevich Attorneys

M. S. WRIGHT.
PNEUMATIC CLEANING MACHINE.
APPLICATION FILED NOV. 17, 1909.

1,015,372.

Patented Jan. 23, 1912.

4 SHEETS—SHEET 2.



Witnesses:
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Carlin G. Milam,

Inventor:
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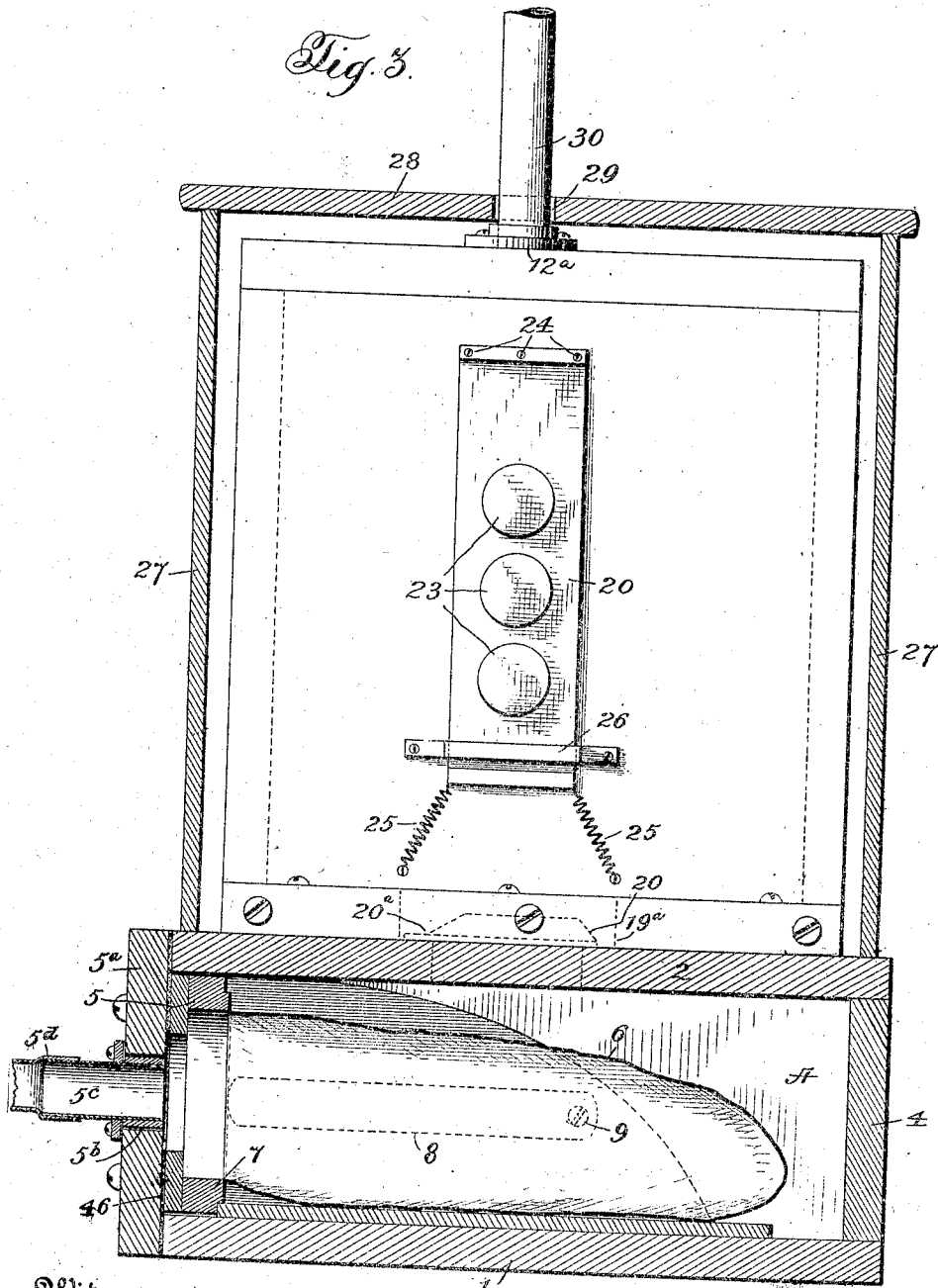
By T. W. Milam, Attorney.

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4 SHEETS—SHEET 3.



Witnesses:

James Hutchinson
Edwin P. Milne

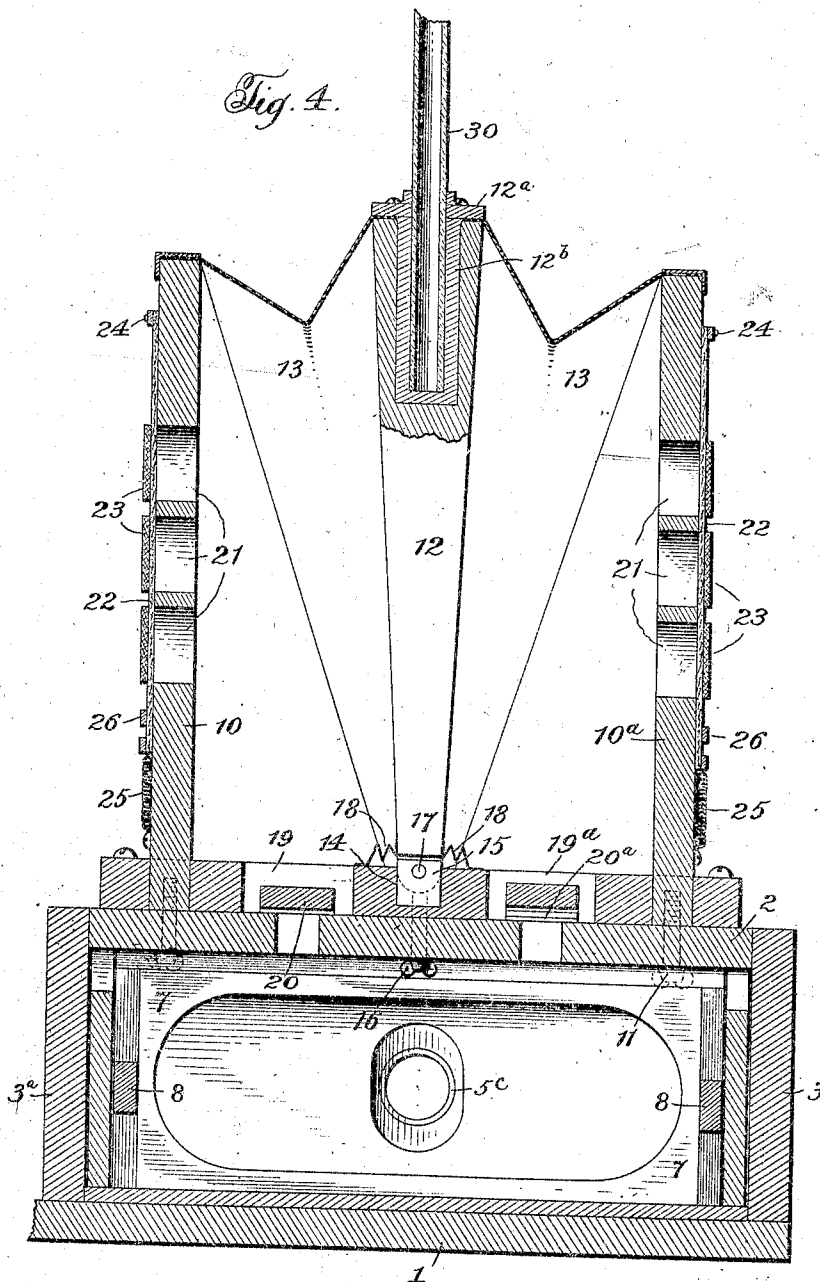
Inventor:

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4 SHEETS—SHEET 4.



Witnesses:

Inventor:

James Hutchinson:

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By Thomas W. Milam, Attorneys.

UNITED STATES PATENT OFFICE.

MORRIS S. WRIGHT, OF WORCESTER, MASSACHUSETTS, ASSIGNOR TO M. S. WRIGHT COMPANY, OF WORCESTER, MASSACHUSETTS.

PNEUMATIC CLEANING-MACHINE.

1,015,372.

Specification of Letters Patent.

Patented Jan. 23, 1912.

Application filed November 17, 1909. Serial No. 528,618.

To all whom it may concern:

Be it known that I, MORRIS S. WRIGHT, citizen of the United States, residing at Worcester, in the county of Worcester and State of Massachusetts, have invented certain new and useful Improvements in Pneumatic Cleaning-Machines, of which the following is a specification, reference being had therein to the accompanying drawing.

This invention relates to pneumatic cleaning and dust collecting apparatus, having particular reference to a machine of the character stated adapted for the gathering of dust or the like from surfaces to be cleaned, through the medium of vacuum creating instrumentalities.

It is the main object of the invention to improve upon the type of pneumatic cleaning machines, to the end that the same are rendered more compact, durable, efficient in operation, and cheap to manufacture.

More particularly the invention includes a wind-chest or vacuum chamber upon which is mounted the operating or exhausting pneumatics or bellows and a dust receiving receptacle in the wind-chest, with novel means of connection for the various parts.

Further, the invention includes means whereby the dust receiving receptacle also constitutes means for filtering the air containing dust forced into the receptacle by suction, together with means whereby the dust receptacle may be readily removed for cleansing purposes and to this end contemplates a removable drawer for the wind-chest and a removable dust receiving bag of filtering material positioned in said drawer, with efficient means for holding said parts in position.

The invention also includes a novel type of valve construction, whereby the operation of the exhausting bellows is rendered more accurate and efficient.

Further the invention includes many minor details of improved construction and arrangement of parts, to be more particularly pointed out hereinafter in the description, which for a clear understanding of the invention should be read in connection with the accompanying drawings, which form a part hereof, and wherein is disclosed an embodiment of the invention which has proven satisfactory.

In the drawings, Figure 1 is a rear elevation with a portion of the casing shown

in section, Fig. 2 a top plan view with parts in section, Fig. 3 a vertical cross section, Fig. 4 a vertical longitudinal section, and Figs. 5 and 6 are detail views.

Referring now more particularly to the drawings wherein like reference numerals relate to corresponding numerals throughout the several figures of the drawings, a wind-chest or vacuum chamber is provided the same being designated as a whole by the reference character A and comprising a bottom or base part 1, a top part 2 preferably being co-extensive with the base, and sides 3—3^a and back 4. The said wind-chest is open at its front and is adapted to be closed by the front wall 5^a of a movable receptacle in the form of a drawer 5, said wall 5^a having portions which overlap the wall of the chest surrounding the opening in the front thereof. Positioned preferably centrally of the front wall 5^a of the drawer is an opening 5^b adapted for the reception of a suitable coupling 5^c for the usual flexible tubing 5^d which connects with a nozzle of any desired construction, the latter constituting no part of the present invention, but which is adapted as is usual to play over the surface to be cleaned and collect the dust and dirt from such surface. Means to be more particularly referred to hereinafter, is provided for creating a vacuum in the wind-chest A and drawing the dust laden air through the opening 5^b by suction. To the end that the air containing dust will be properly filtered, and the dust gathered together for removal, a receptacle conveniently in the form of flexible bagging 6 of any desired construction is mounted on the drawer 5 with the open end thereof arranged over the opening 5^b in said drawer, whereby to intercept the dust. The dust receptacle or bag 6 has extending around its mouth portion a relatively rigid frame 7 secured thereto in any desired manner and constructed to fit snugly the interior walls of the drawer. In order to hold said bag in position whereby the frame at the mouth end thereof will be firmly held against the inner surface of the front wall 5^a of the drawer holding means is provided, conveniently friction holding means, which said means is releasable in order to permit the ready disengagement of the bag from the drawer. This holding means conveniently comprises oppositely disposed rigid arms 8 one upon opposite sides of the bag and piv-

oted adjacent their rear ends as at 9 to the inner wall of the sides of the drawer 5. By reason of the pivotal connection of said arms 8 they are adapted to be swung downwardly to the end that the forward terminals thereof will contact with the frame 7 of the bag and force the same into holding engagement with the front wall of the drawer 5. This arrangement positively precludes any accidental separation of the dust receptacle by the force of suction or otherwise and maintains a practically closed joint between the bag 6 and front wall 5^a of the drawer.

Mounted upon the top wall 2 of the wind-chest is the vacuum creating means preferably comprising double acting exhausting bellows or pneumatics and constructed as follows: 10 and 10^a are vertically extending relatively stationary back boards for the bellows conveniently extending from front to back of the wind-chest and secured to the top wall thereof in any desired manner, preferably by thumb screws 11 projecting through the top wall 2 of the wind-chest and operable from the interior of the wind-chest upon the removal of the drawer 5. 12 is a movable section of the bellows arranged intermediate of the stationary boards 10 and 10^a and constituting a partition to make the bellows double acting. The movable partition 12 and the stationary boards 10 and 10^a are connected by the folding webs or diaphragms 13 of ordinary construction. On the top wall of the wind-chest is provided a recessed member 14 adapted for the reception of a hinge block 15 the member 14 being secured conveniently by thumb screws 16 in the top of the wind-chest. The hinge block is provided with recesses and lugs adapted to register with the same parts in the lower end of the movable partition 12 and a pintle 17 passing through the interlocking portions of the hinge block and partition constitutes an efficient pivot and one which is strong and durable. Folds of leather or the like 18 are arranged on opposite sides of the movable partition 12 at the hinged end thereof to prevent leakage of the air at the hinged connection. The top wall of the wind-chest A is provided with one or more openings 19 and 19^a respectively on opposite sides of the movable partition 12. These openings establish communication between the interior of the wind-chest and the exhausting bellows and valves of any desired construction are provided for opening and closing the openings on opposite sides of the partition alternately. The construction of valves shown comprise members 20 hinged at one side 20^a to the top surface of the wind-chest and arranged to automatically swing about the pivotal connection to open or close communication between the wind-chest and exhausting bellows according to

the operation of the latter. Each of the stationary back boards of the bellows is provided with one or more openings 21, three of such openings being shown for the purpose of illustration. These openings are adapted to be closed and opened by a novel construction of flap valve to be now described. It has been customary to form valves for this purpose of leather or the like, but it has been found in practice that the material could not be formed sufficiently thin to provide the necessary flexibility without being pervious to air. The present construction of valve is designed to overcome these difficulties and with this in view the body 22 of the valve is formed of flexible material conveniently leather, and adjacent each of the openings 21 is a relatively rigid or thickened material, which shall be termed for convenience reinforcing disks 23 which disks are secured in any desired manner as by gluing to the outer surface of the body members 22. These reinforcing disks may be constructed of any desired material, as leather or rubber and with the backing of the body portion 22 of the valve will constitute an efficient closure for the openings 21 and a closure impervious to the air. Again by arranging the reinforcing disks upon the outer surface of the body portion 22, the body portion itself is not hardened but will remain sufficiently soft to prevent its impact upon the back boards 10 and 10^a, hardly noticeable, thereby obviating any additional noise incident to the reinforcing feature. The body portions of the valves are secured at their upper ends in any convenient manner as by tacks 24 to the outer surface of the stationary boards 10 and 10^a, and spring members 25 secured respectively to the lower ends of the body of the valves and said stationary boards tend to hold the valves in closed or flat position against the sides of said boards. The spring members are conveniently in the form of spirals projecting outwardly at an incline at the opposite sides of the valve body adjacent the lower end thereby tending to more firmly hold all portions of the valve flat when in closed position. Means are provided for preventing any unnecessary lateral play of the valves and guiding the same in their movement which means comprise guide members 26 secured to the outer surface of the boards 10 and 10^a adjacent the lower ends of the valves and overlapping the same while permitting vertical movement of the lower ends of said valves.

A frame comprising upright side supports 27 and a connecting top member 28 is secured to the wind-chest in any desired manner the top member 28 having an elongated slot 29 therein for the reception and guidance of a projecting rod 30 secured in any desired manner to a cup shaped member 12^b fitting

in a recess in the movable partition 12 and secured by a cap 12^a. The projecting member 30 constitutes a handle or operating member to be engaged by the hand of the user for imparting reciprocating movement to the movable partition 12 about its pivotal connection, said movement being guided by the slot 29 in the guide member 28 and the ends of said slot constituting means for limiting the movement of the operating handle in either direction. The handle as well as the parts 12^a and 12^b are preferably of metallic formation.

Means is provided for extending the base portion of the apparatus whereby the several parts are more firmly supported when the machine is in operation, the said means however being collapsible whereby the same will offer no substantial obstruction or protuberance when the machine is in use. This means, which is termed an extensible platform section and may constitute a foot rest for the operator, comprises a substantially flat body 31 pivoted at its inner end by hinged members 32 to the side 3 of the wind-chest in a manner to constitute a continuation of the bottom 1 of the wind-chest when in lowered position and to rest upon the surface. Novel means is provided for maintaining the platform in lowered position and against movement, the same comprising bracket supports 33 secured to the wind-chest adjacent the top thereof and having projecting ears 34 for the reception of angled extensions 35^a of bracket arms 36. The said bracket arms are free to swing in the bearings formed by said ears 34 and when the platform is lowered for use lugs or projections 37 at the outer ends of said arms engage apertures 38 in the sides of said platform. The lugs 37 may be formed by offsetting the free ends of the bracket arms 36. In order to hold said bracket arms in engagement with the apertures 38 in the platform a spring member is inserted between the angled extensions 35^a and connected to the ends of each, the said spring being designed to normally draw the arms toward one another. The locking recesses or apertures 38 are conveniently reinforced by apertured metallic plates 39.

The operation may be briefly described as follows: The extended base or platform having been lowered and the bracket arms having been swung down about their pivots the offset free ends thereof are engaged with the locking apertures and the spring exerts inward pressure on the offset terminals to firmly lock the platform in position, when the operator grasps the projecting handle 30 and moves the same back and forth about its pivot at the lower end thereof. This reciprocating movement of the movable partition alternately collapses the respective bellows. When one of the bellows is col-

lapsed the valves 22 will be forced outwardly from engagement with the boards 10 and 10^a against the action of the springs 25 thereby uncovering the opening 21 for the emission of air and when a bellows is expanded it draws air through the valve openings 20, the reverse operations taking place at the same time in the other bellows as is apparent. The vacuum created in the wind-chest by the exhausting bellows draws into the chest the dust laden air the air being filtered by passing through the dust receptacle or bag 6 and the dust lodging in said bag for collection. When it is desired to remove the bag for the purpose of emptying the same or for gaining access into the interior of the chest the drawer is drawn outwardly, the locking arms 8 are swung upwardly about their pivots thereby releasing the bag from holding engagement with the drawer, when the bag may be removed and emptied or cleaned. It is obvious of course that new bags may be substituted from time to time as occasion demands.

The drawer 5 is held in closed position preferably by the following means: An elongated slot or recess is provided in the sides of the wind-chest adjacent the front thereof as shown at 41 the said recess being adapted to register with a similar recess 42 in the sides of the front wall of the drawer. 43 are spring members secured at one end 43^a to the sides of the chest, each said spring members being adapted to normally rest in the recesses 41 and connected at their opposite ends to pintles 44 adapted to fit in the recesses 42 of the front wall of the drawer, the pintles having a flange to overlap the wall of the recesses 42 and terminating in an operating knob 54. It is noted that when the drawer is closed the locking pintles 44 are bodily and freely movable into position to engage with the recesses 42 in the drawer, the tension of the spring being to exert inward pressure on the pintles thereby holding the front wall of the drawer snugly against a suitable packing 46 interposed between said front wall of the drawer and the edges of the wind-chest. Should it be necessary to gain access to the interior of the exhausting bellows or the valves 20, it is only necessary to remove the drawer 5 and its bag, when the operator can readily remove the thumb screws 11 and 16 thereby releasing the connection between the exhausters and the vacuum chamber or wind-chest. When released, the exhausters may be removed for the purpose of replacing, cleansing or repairing of parts.

It will be appreciated that the front wall 5^a of the drawer also constitutes a closure for the vacuum chamber A, which closure has a dust inlet aperture or opening. Still another very important characteristic of the front wall 5^a resides in the fact that the

same also constitutes a closure for the open mouth of the bag maintained by the collar or frame 7. This construction is of especial advantage in connection with the removal of the dust from the filtering bag. When in position the arms 8 which engage the collar or frame 7 at the open end of the bag lock the bag in position so that the bag constitutes in effect a connected part of the front wall 5^a. This locking engagement is maintained when the drawer is removed from which it will be seen that the bag will be closed by the front wall 5^a of the drawer and may be transported to even a remote place of deposit without any likelihood of dropping the dust. Subsequently the bars 8 are released when the bag may be removed and the open mouth of the same maintained by the collar 7 permits the dust to readily fall out.

I claim:

1. In a dust collector, the combination with a casing, having a dust collecting chamber therein formed with a side opening, means for exhausting the air from the chamber, a filtering dust receiving receptacle located within the chamber and having an unrestricted mouth or open end, a frame for the said open end, a removable wall member for the chamber constituting a closure for the same and for the dust receptacle mouth, and having a relatively small inlet opening communicating with the interior of the receptacle, means for removably connecting the wall to the casing, and means for removably connecting the said receptacle frame to the said wall.

2. In a machine of the character described, the combination of a casing having an open side, a bag within the casing having an open mouth at said open side of the casing, a wall for closing said side having an inlet port, means for pressing the wall against the casing, and means for pressing the bag in an opposite direction against said wall so as to constitute a releasable but closed joint between the wall and chamber and between the wall and bag.

3. In a machine of the character described, the combination of a filtering receiving bag having an open mouth, a wall for closing said opening having an inlet

port, a frame for the mouth of the bag, and means for removably holding the bag on said wall comprising a pivoted arm carried by the wall and adapted to engage said frame.

4. In a machine of the character described, the combination of a casing having an opening, a removable wall for said opening, said wall having an opening and a projection within the casing, a filtering receiving bag, a relatively rigid frame for the mouth of the bag, and movable means mounted on said projection of the wall for connecting said frame of the bag to said wall.

5. In a device of the character described, a casing having an opening, a dust receiving receptacle adapted to be inserted through said opening, a frame for the mouth of the receptacle, a removable closure for the opening having a dust inlet, and movable means within the casing for forcing the frame into air tight engagement with the closure.

6. In a device of the character described, a dust receiving chamber having an opening, a removable flexible dust receiving filtering receiver in the receptacle, a dust inlet member forming the closure for the opening, means for detachably securing the closure to the chamber, and independent movable means for detachably connecting the closure and receptacle.

7. In an apparatus of the character described, the combination of a casing having a chamber, the casing having an opening in its side, a removable wall for said open side of the casing, said wall having an inlet opening, a filtering dust receiving receptacle within the chamber, the receptacle having an open mouth, a relatively rigid frame surrounding said open mouth, and means within the receptacle for holding the frame of the bag in substantially air tight engagement with the removable wall of the casing.

In testimony whereof I affix my signature in presence of two witnesses.

MORRIS S. WRIGHT.

Witnesses:

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B. F. SAWYER.