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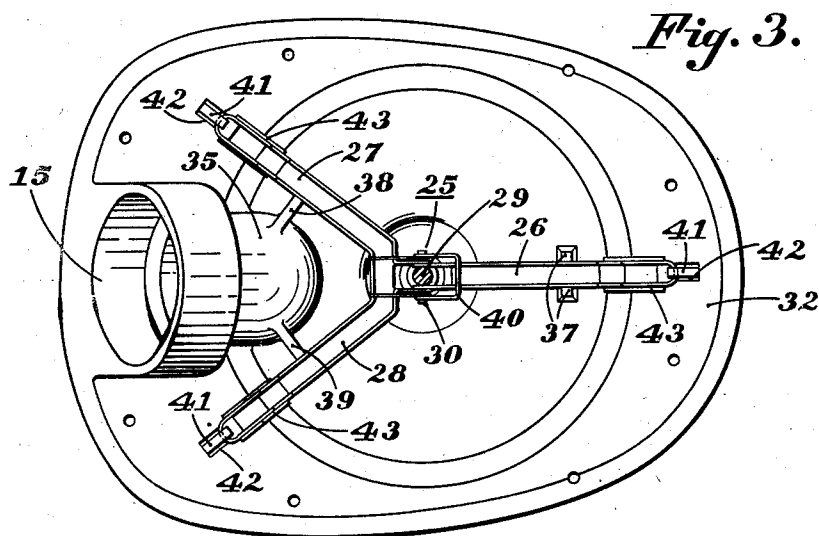
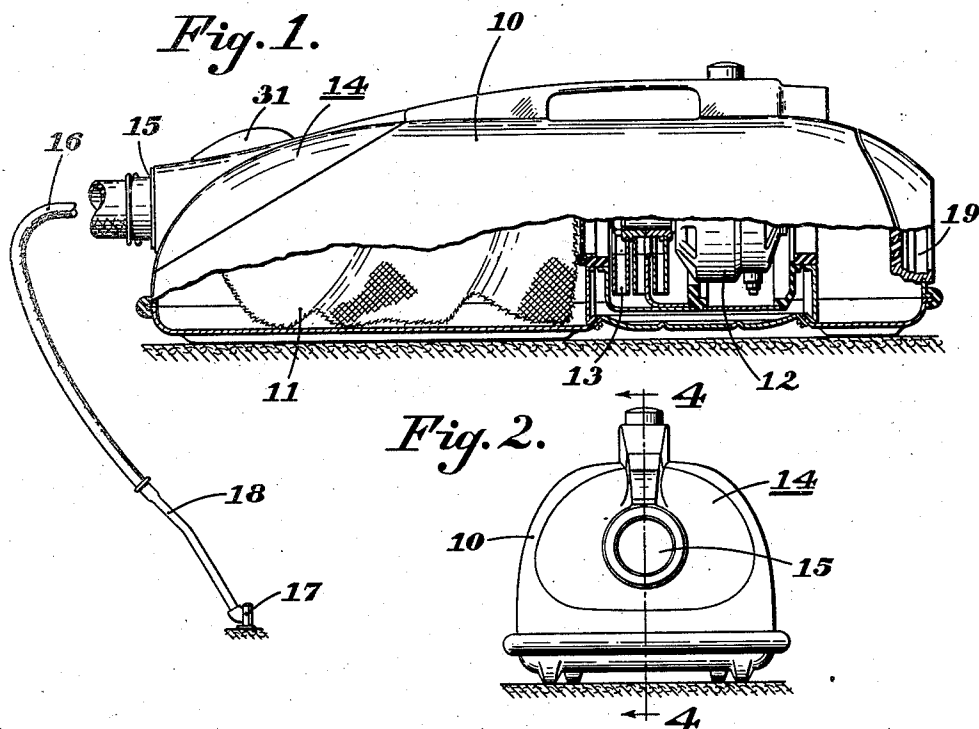
C. L. BROWN, JR

2,220,060

CLOSURE MEMBER

Filed May 19, 1939

2 Sheets-Sheet 1



INVENTOR.

BY *Charles L. Brown, Jr.*
Arthur G. Pringley
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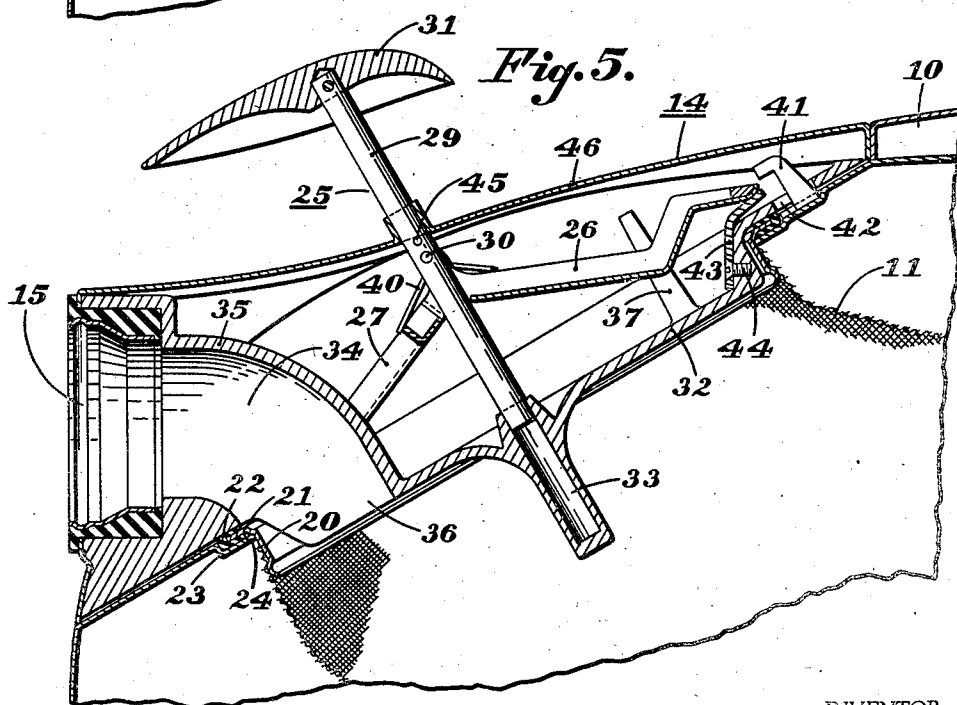
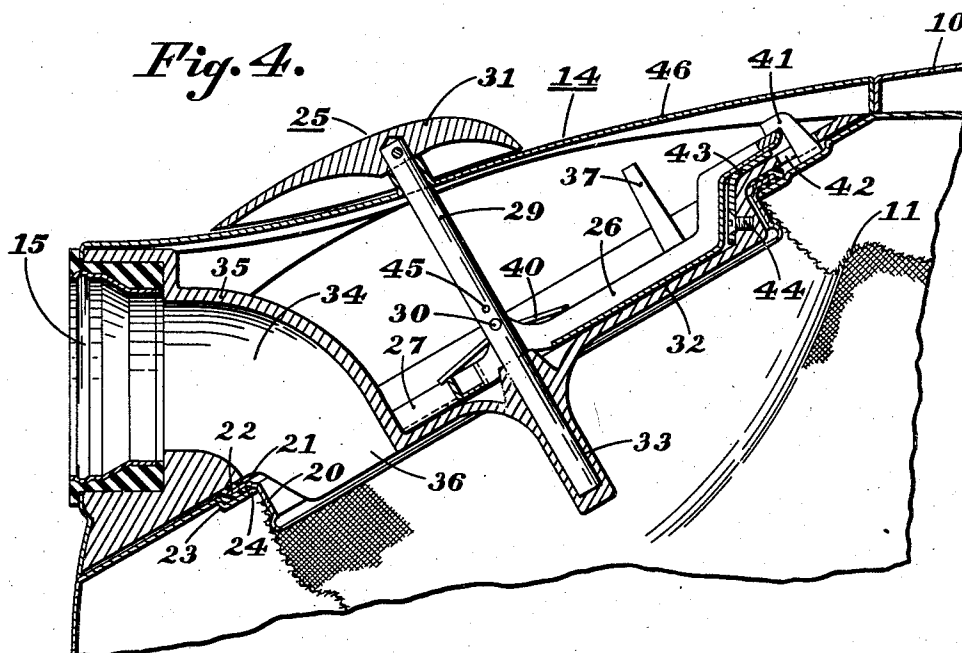
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CLOSURE MEMBER

Filed May 19, 1939

2 Sheets-Sheet 2



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2,220,060

CLOSURE MEMBER

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corporation of Delaware

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5 Claims. (Cl. 292—6)

My invention relates to closure members and more particularly to a closure member for a vacuum cleaner of the type pulled around by a hose connected to it.

5 An object of my invention is to provide an improved closure member for a vacuum cleaner of this type with an oblique opening for the dust separating member and an opening in a vertical plane in the closure member for receiving the
10 hose.

Other and further objects will appear as the description of my improved closure member progresses.

15 What I consider to be novel and my invention may be better understood by reference to the following specification and appended claims when considered in connection with the accompanying drawings, in which

20 Fig. 1 is a side view of a vacuum cleaner, broken away in part, incorporating my improved closure member;

Fig. 2 is an end view of the vacuum cleaner;

25 Fig. 3 is a top view of the closure member with the cover removed connected to the vacuum cleaner;

Fig. 4 is a side sectional view of the closure member and the adjacent portion of the vacuum cleaner, with the closure member in a locking position; and

30 Fig. 5 is a sectional view similar to Fig. 4, with the locking mechanism in the inoperative position.

Referring to the drawings, 10 indicates a vacuum cleaner casing in which is housed a dust separating member 11, and an electric motor 12 driving a multistage centrifugal fan 13. A closure member 14 is connected to one end of the casing and is provided with an inlet opening 15 in which a flexible hose 16 is connected. Hose
40 16 is connected to a cleaning tool 17 with an interposed substantially rigid tubular member 18.

In the normal operation of the vacuum cleaner, the motor 12 drives the fan 13 and draws air through the opening 15, and exhausts the air through an opening 19 at the opposite end of the casing 10. Closure member 14 is provided for permitting the removal of the dust separating member 11 periodically, for emptying the dust collected therein. Dust separating member 11 is provided with a ring 20 having an outwardly extending flange 21 covered by a flexible gasket 22. Flange 21 and gasket 22 rest on a seat 23 provided around an opening 24 in casing 10. Opening 24 is located in a plane at a considerable angle
55 to the vertical. The dust separating member 11

is supported in opening 24 with its mouth opening upwardly.

A locking mechanism 25 is provided for locking the closure member 14 to the casing 10. Locking mechanism 25 includes three pivoted arms 26, 27, and 28. Arm 26 is pivotally connected to rod 29 by means of a pivot pin 30. Arms 27 and 28 are formed integrally and pivoted to the rod 29, also by the pivot pin 30. At its outer end, rod 29 is provided with a handle 31. Closure member 14 is provided with a back plate 32 in the form of a casting. Plate 32 is provided with a central recess 33 in which the rod 29 is received. A passage 34 communicating with opening 15 is provided by a conduit 35 formed integrally with the plate 32. Conduit 35 communicates at its inner end through opening 36 with the interior of the dust separating member 11. Movement of arm 26 from an inoperative to a locking position is guided by spaced posts 37, projecting upwardly from plate 32. Movement of arms 27 and 28 is guided by two projections 38 and 39, engaging respectively arm 27 and arm 28. Projections 38 and 39 are formed integrally with the plate 32. Arms 26, 27, and 28 are biased downwardly toward plate 32 by spring 40.

Casing 10 is provided with a plurality of bosses 41 in the form of hooked projections extending through openings 42 in plate 32. Bosses 41 are provided for cooperation with each of the arms 26, 27, and 28. The arms are held in locking engagement with the bosses 41 by leaf springs 43 in the form of plates, secured to the back plate 32 by means of screws 44. To move the locking mechanism 25 from the locking position of Fig. 4 to an inoperative position, the handle 31 is grasped and moved away from the closure member 14 in a direction normal to the plane of opening 24. As the rod is moved in this direction, arms 26, 27, and 28 move inwardly from engagement with the bosses 41 pivoting on pivot pin 30. Outward movement of the rod 29 is stopped by engagement of a pin 45 with the cover 46. The closure member 14 may then be removed from the casing 10 by a continued movement of the handle 31 in a direction normal to the plane of opening 24. When the closure member 14 is replaced on the casing 10, the closure member may be locked thereto by pressure applied on the handle 31 in the direction in which the closure member is moved in placing it on the casing 10. As the rod 29 moves inwardly into the recess 33, the arms 26, 27, and 28 move outwardly, guided by the posts 37 and projections 38 and 39, into engagement with the bosses 41. The springs 43 hold the arms in tight

engagement with the latching members. When the handle is in the fully closed position, the arms 26, 27, and 28 extend outwardly perpendicular to the axis of the rod 29. In this position, there is no tendency for the arms to be accidentally moved from engagement with the latching members 41.

In the assembly of the closure member 14, the springs 43 are secured to the plate 32. The rod 29 is inserted in the recess 33 and the arms 26, 27, and 28 secured thereto by the pivot pin 30. The spring 40 is inserted over the ends of pin 30 with its ends engaging arm 26 and the combined arms 27 and 28. The cover 46 is then placed over the plate 32 and secured thereto. The handle 31 is secured to the end of rod 29. The assembly of the closure member is then complete.

In the operation of the vacuum cleaner, the casing 10 is usually located centrally of the area being cleaned. As the cleaning tool 17 traverses the surface around the casing 10, it may be found desirable to clean a surface that cannot be reached from the position of casing 10. Casing 10 is then moved by a pull on the flexible hose 16. The force of the pull necessary to move casing 10 is transmitted through the closure member 14. Since the inlet opening 15 is in a vertical plane and the casing 10 rests on a horizontal surface, the force transmitted is in a horizontal direction. The plane of opening 24 is oblique to the plane of inlet opening 15 and there is no tendency for a force transmitted through the closure member 14 to release the locking mechanism 25. Release of the locking mechanism 25 requires a force in a direction normal to the plane of opening 24 which is oblique to the horizontal direction of the force utilized in moving the casing 10. The two arms 26 and 27 located closely adjacent to and at each side of the opening 15 prevent any tendency of movement of the closure member 14 in a horizontal direction away from the casing 10. The radial spacing of arms 27 and 28 is less than the spacing of arm 26 from arms 27 and 28. The unequal spacing of arms 26, 27, and 28, in addition to reinforcing the closure member 14 at the point of application of the force for moving casing 10, has the further advantage of accommodating itself to the necessarily elongated shape of the closure member 14, as a result of its location at an angle to the horizontal axis of casing 10.

What I claim is:

1. A closure member for a casing having an opening oblique to the axis of the casing, said closure member having an opening with an axis parallel to the axis of the casing, radially spaced arms secured to said closure member and located at each side of the opening of said closure member, a third arm spaced radially midway between said first-mentioned arms, bosses extending outwardly from said casing around said casing opening entering openings in said closure member, a rod carried by said closure member movable in a

direction normal to the plane of the opening of said casing, and means pivotally connecting said arms to said rod, whereby movement of said rod inwardly toward said closure member causes said arms to move outwardly into engagement with said bosses to lock said closure member to said casing.

2. A closure member including a plate having a central recess, a rod received in said recess and adapted to move in a direction perpendicular to the plane of said plate, a handle connected to one end of said rod for reciprocating said rod, a plurality of radially spaced arms pivotally connected to said rod, spring means engaging said arms urging them toward said plate, said plate having a plurality of boss receiving openings, and a plurality of spring means secured adjacent to said boss receiving openings, said arms moving outwardly to engagement with said boss receiving openings upon movement of said rod in one direction and held in locking engagement with the bosses by said last-named spring means.

3. A closure member including a plate having a central recess, a rod received in said recess and adapted to move in a direction perpendicular to the plane of said plate, a handle connected to one end of said rod for reciprocating said rod in the direction of its axis, a plurality of radially spaced arms pivotally connected to said rod, spring means engaging said arms urging them toward said plate, said plate having a plurality of boss receiving openings, a plurality of spring members secured adjacent to said boss receiving openings, said arms moving outwardly to engagement with said boss receiving openings upon movement of said rod in one direction, and projections from said plate guiding movement of said arms outwardly to a locking position with said bosses upon movement of said rod in one direction.

4. A locking mechanism for a closure member including a rod reciprocable from a latching to an unlatching position, a plurality of radially spaced arms, means pivotally connecting said arms to said rod, spring means biasing said arms to rotation on said pivot means, and a second spring means holding said arms in latching position against the bias of said first-named spring means.

5. A closure member including a plate having a central recess, a rod received in said recess and adapted to move in a direction perpendicular to the plane of said plate, a handle connected to one end of said rod for reciprocating said rod in the direction of its axis, two radially spaced arms integrally connected and pivotally secured to said rod, a third arm radially spaced from said first-mentioned arms and pivotally secured to said rod, said plate having a plurality of boss receiving openings, and a plurality of spring members secured adjacent to said boss receiving openings and adapted to secure said arms in locking position upon engagement with said bosses.

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