July 24, 1928. 1,678,111

W. A. FRANTZ

SUCTION CLEANER

Filed Dec. 4. 1922 3 Sheets-Sheet 1

Fig. 1.

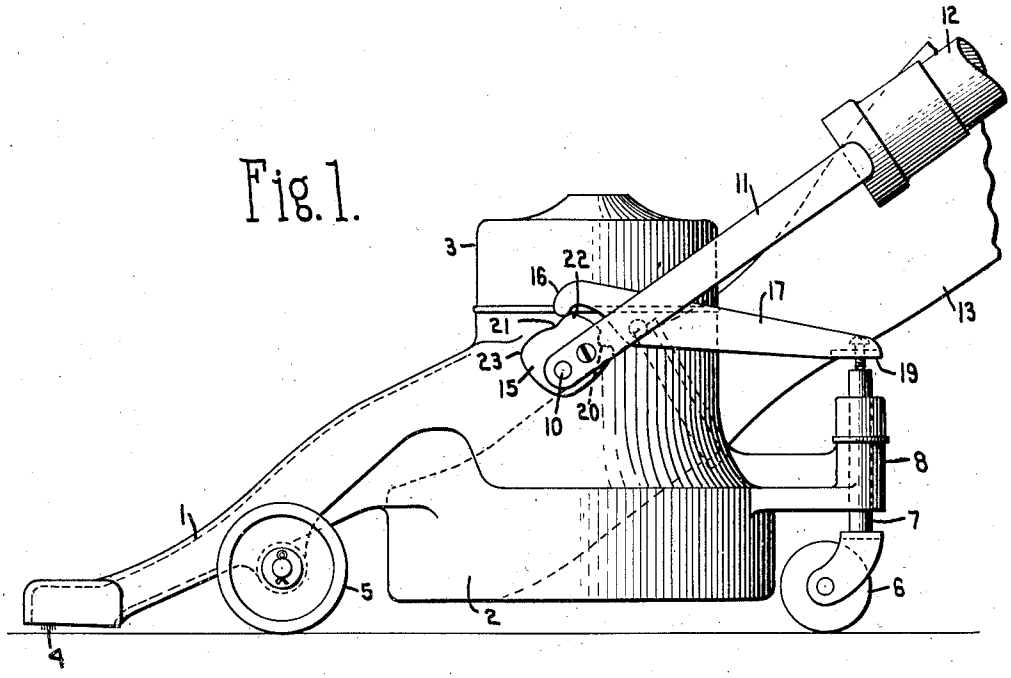
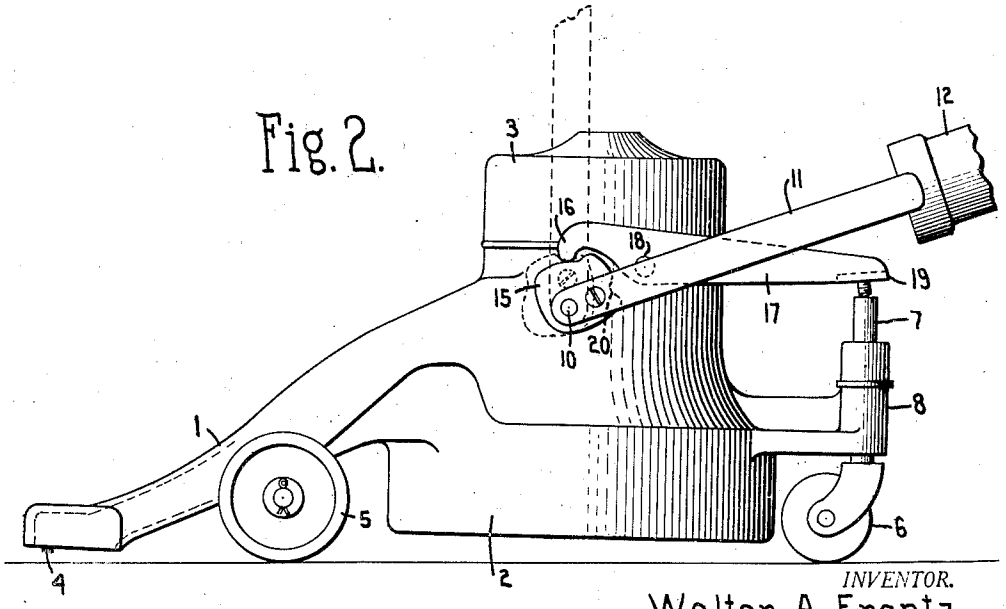


Fig. 2.



INVENTOR.
Walter A. Frantz
BY
Harold Ellis Smith
ATTORNEY.

July 24, 1928. 1,678,111

W. A. FRANTZ

SUCTION CLEANER

Filed Dec. 4, 1922 3 Sheets-Sheet 2

Fig. 3.

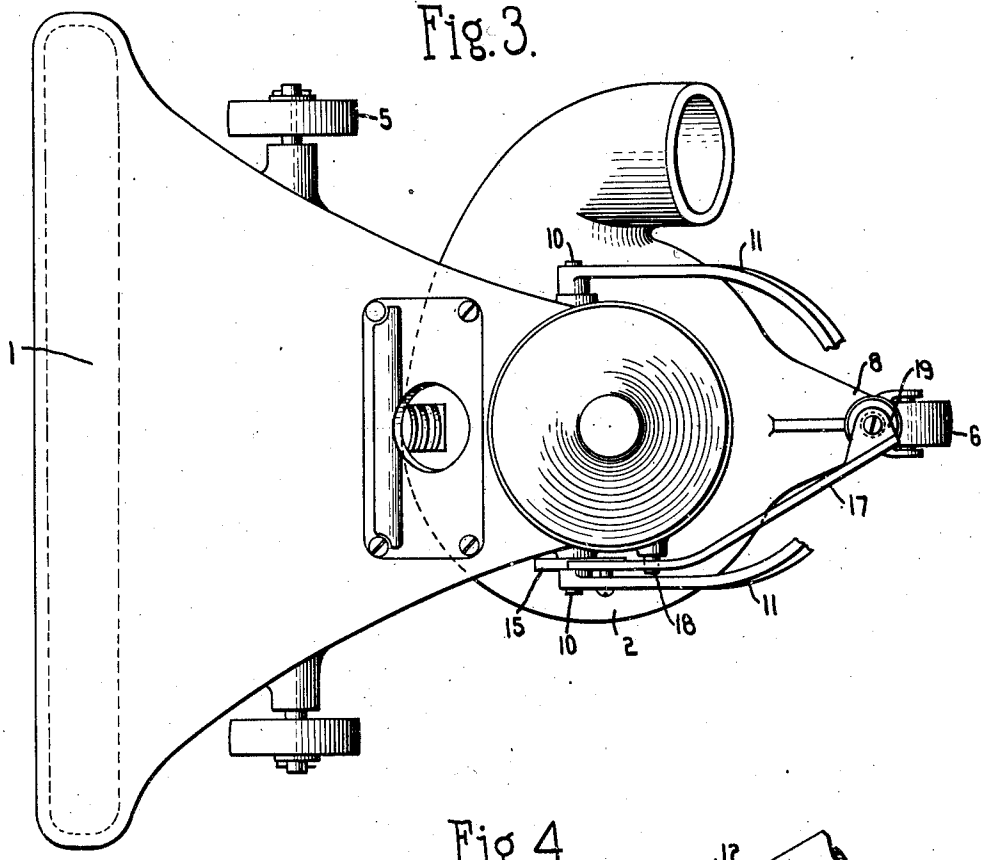
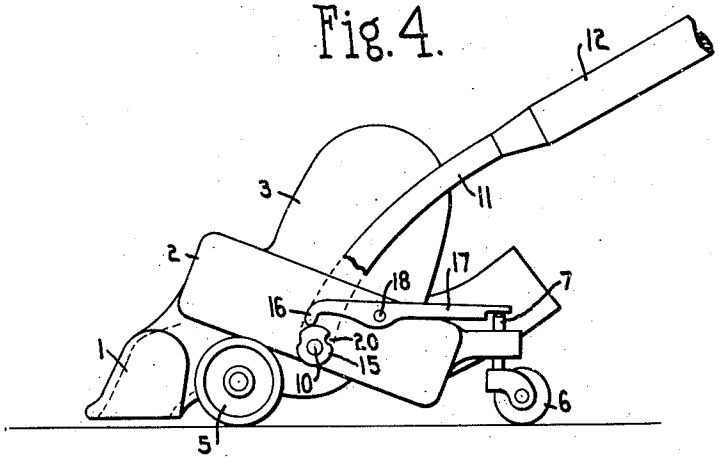


Fig. 4.



INVENTOR.

Walter A. Frantz

BY Harold Allen Smith

ATTORNEY.

July 24, 1928. 1,678,111

W. A. FRANTZ

SUCTION CLEANER

Filed Dec. 4, 1922 3 Sheets-Sheet 3

Fig. 5.

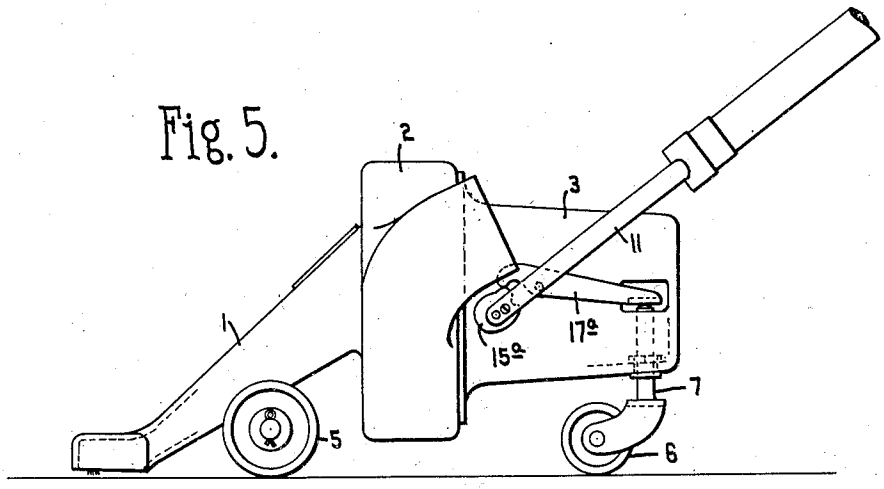
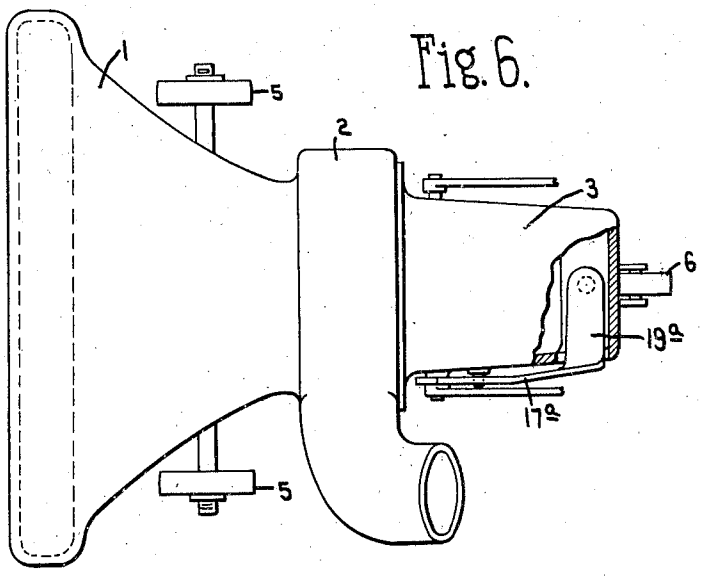


Fig. 6.



INVENTOR.
Walter A. Frantz
BY
Harold Ellis Smith
ATTORNEY.

Patented July 24, 1928. 1,678,111

UNITED STATES PATENT OFFICE.

WALTER A. FRANTZ, OF CLEVELAND, OHIO.

SUCTION CLEANER.

Application filed December 4, 1922. Serial No. 604,790.

This invention relates to suction cleaners and has for its object the provision of a floor cleaning device wherein the height of the collecting nozzle is adjusted automatically by the position of the handle. It is well known that devices of this character operate most successfully only when adjusted strictly in accordance with the presence or thickness of the rug or floor covering. Thus upon a bare floor or upon a thin rug it is desirable that the nozzle be held at a low level, while upon a thick and soft rug it is necessary that the nozzle should be elevated somewhat. Nearly all cleaners are made with an adjustment device, but it is very seldom that the user knows what adjustment to make, or knowing the adjustment, makes it. Indeed, in order to secure the maximum effect of such an adjustment it would be necessary to manipulate it every time the cleaner was run over the edge of the rug which is obviously impractical with the prior machines.

I have observed that in the operation of any device which is pushed by a handle, whether suction-sweeper, carpet-sweeper, lawn-mower or wheel-barrow, it is customary when the opposition to forward movement is small to hold the handle at a comparatively high angle and thus secure rapid action, while if the opposition be increased the handle is instinctively lowered so as to secure a more direct push, and it is the essence of my invention to employ this instinctive reaction of the operator to effect the adjustment of the cleaner nozzle thereby enabling its elevation or depression instantly, automatically, easily, and without the necessity of thought on the part of the operator. Other objects of the invention are the provision of a simple and inexpensive cleaner-support; the provision of new and improved means for holding the handle upright when the cleaner is not in use; the provision of automatic means for elevating the nozzle when the cleaner is put away so as to relieve the nozzle-brush of pressure and deformation; while further objects and advantages will become apparent as the description proceeds.

In the drawings accompanying and a part of this application I have shown certain illustrative embodiments of my invention but without intent to limit myself thereto since the same can be modified in many ways within the terms of the annexed claims. Fig. 1 is a side elevation of a suction cleaner embodying my improvements and showing the nozzle depressed; Fig. 2 is a similar view showing the nozzle elevated; Fig. 3 is a top plan view of the device shown in Fig. 1; Fig. 4 is a side elevation of a different design of cleaner illustrating a mode of connection between the handle and the elevating device; Fig. 5 is a side elevation of a different type of cleaner provided with my improvements; and Fig. 6 is a top plan view of the cleaner shown in Fig. 5.

The essential parts of the device are a body or casing, a floor tool, supporting means, and an operating handle. In the present embodiment this body is constituted by the casing of a suction cleaner, having a floor tool or nozzle 1, a fan casing 2, and a motor casing 3. I have chosen for illustrative purposes a cleaner of the electric type although it will be understood that I do not limit this invention to such use since it can equally well be employed with traction-operated or hand-cranked devices. The nozzle is formed with a downwardly facing collecting mouth shown in dotted lines in the different views in which is ordinarily mounted a suitable brush 4, either movable or fixed. The cleaner is supported upon two forward wheels 5—5 mounted on fixed axes, one at each side of the machine, and a central rear caster 6 whose shank 7 is slidably and rearwardly mounted in the bracket 8 projecting centrally at the rear of the machine. Pivoted to each side of the casing upon the horizontal gudgeons 10—10 are the fork-arms 11—11 which carry the operating handle 12 by which the dust bag 13 is supported and the cleaner as a whole is manipulated. Rigidly secured to one of these arms adjacent its gudgeon is a cam plate 15 engaging the bent end 16 of a lever 17 pivoted to a second horizontal gudgeon 18 also carried by the cleaner casing and having at its far end a horizontal portion 19 engaging the shank 7. The cam plate 15 is formed with an irregular contour so that when the handle is held at an intermediate angle as shown in Fig. 1, the portion 19 of the lever is depressed relatively to the casing, thereby elevating the casing relatively to the shank 7 and depressing the nozzle; while if the handle be lowered further as shown in Fig. 2, the portion 19 is allowed to rise, thereby permitting the elevation of the nozzle. The plate is also formed with a suitable

notch 20 adapted to receive the projection 16 when the handle is moved to vertical position whereby the rear end of the casing is similarly allowed to fall, raising the nozzle and holding the handle securely in place. This serves the double function of relieving the weight on the brush and of holding the the handle upright.

In Fig. 4 I have illustrated an arrangement and adaptation of my improvements to a cleaner of the upright type, wherein the motor 3 is at the top and the floor tool or nozzle is at the bottom. The various parts are identified by the same reference characters and will be clear to those skilled in the art without further description.

In Figs. 5 and 6 I have shown a third type of cleaner in which the nozzle is located in front, the motor in the rear, and the fan chamber intermediate thereof, the common axis of the fan chamber and motor being approximately horizontal. In this case I have shown the forward wheels 5—5 as mounted on fixed axes, and the rear caster 6 having a slidable and rotatable shank 7 bearing against the horizontal portion 19^a of a lever 17^a operated by a cam plate 15^a carried by the nozzle-fork 11 as before.

While I do not limit myself to any fixed type of cam it is further to be noticed that the particular cam here shown has two notches 20, and 21 and two raised portions 22 and 23. The notch 20 accommodates the projection 16 when the handle is vertical, the projection 22 depresses the nozzle when the handle is at a high angle, and the notch 21 receives the projection and allows the elevation of the nozzle when the handle is moved to a lower angle. In case the handle is depressed clear to horizontal position the nozzle is again depressed for the reason that thick rugs are seldom found on stairs or below heavy furniture such as beds and a minimum elevation is generally desired in these places.

I do not confine myself to that construction of cleaner wherein the nozzle is rigid with the remainder of the casing or body or wherein the wheels are fastened individually to the body since my invention is equally applicable to a construction wherein the nozzle is movably attached or wherein the wheels are carried upon a separate frame or chassis as in the reissued patent of William V. Orr, No. 15,423, and my claims are drawn with these and other alterations in view. It will, therefore, be understood that many changes in detail can be made within the scope of my invention and that I do not limit myself to any features of construction, arrangement or design, except as the same are specifically recited in the annexed claims.

Having thus described my invention what I claim is:

1. In a suction cleaner, in combination, a casing having at its forward part a collecting nozzle formed with a narrow elongated inlet mouth arranged transversely of the cleaner axis, a pair of carrying wheels journaled to said cleaner one at each side between said mouth and the center of gravity of the casing, a carrying wheel at the rear of the center of gravity and vertically movable relatively to the casing, an operating handle pivoted to said casing upon a transverse axis between said first wheels and said last wheel, a cam carried by said handle, and a lever pivoted to said casing, one end of said lever engaging said cam and the other end thereof operatively connected to raise and lower said last wheel.

2. In a suction cleaner, in combination, a casing having at its forward part a collecting nozzle formed with a narrow, elongated, inlet mouth arranged transversely of the cleaner axis, a pair of carrying wheels journaled to said cleaner one at each side between said mouth and the center of gravity of the casing, a carrying wheel at the rear of the center of gravity, certain of said wheels being vertically movable relatively to said casing, a lever pivoted to said casing and having one end operatively connected to the movable wheel, an operating handle pivoted to said casing and a cam carried by said handle and engaging said lever.

In testimony whereof, I hereunto affix my signature.

WALTER A. FRANTZ.