This invention relates to a ventilating attachment for water closets, and analogous fixtures of the class set forth in my Patents No. 696,906, July 4, 1911, and No. 1,025,364, May 7, 1912, except that an electrically operated fan is mounted within the ventilating pipe and controlled by an electric switch which, in turn, is controlled by the opening and closing movement of the seat of the closet bowl through the medium of suitable connections between the seat and switch.

The main object of the present invention is to provide simple and efficient means actually controlling the switch and motor-driven fan controlled thereby and also for opening a suitable damper in the ventilating pipe while the fan is in operation.

Another object is to construct the various parts of the ventilating device as a single unit capable of being easily and quickly installed in operative connection with any suitable bowl.

Other objects and uses relating to specific parts of the invention will be brought out in the following description.

In the drawings:

Figure 1 is a side elevation, partly in section of my improved ventilating attachment mounted upon a bowl, which is shown as partly broken away and as provided with a vertically movable seat.

Figure 2 is a top plan of a portion of the closet bowl and seat together with the damper and damper supporting section and mechanism for transmitting motion from the seat to the switch and damper, a portion of the ventilating section being broken away to show the damper in full.

Figure 3 is an enlarged longitudinal sectional view taken on line 3—3, Figure 2.

Figure 4 is an enlarged side elevation of the lower horizontal pipe section upon which the damper and switch together with the operating means therefor is mounted.

Figure 5 is an enlarged side view of the rear end of the lower ventilating section and of the lever switch in section and the operating crank for closing the same.

Figure 6 is an enlarged detail sectional view of a portion of the lower horizontal section of the ventilator showing the stop for limiting the closing movement of the damper and opening movement of the switch operating member.

Figure 7 is an enlarged detail sectional view taken on line 7—7, Figure 2.

In order that the invention may be clearly understood I have shown a closet bowl —A— as provided with a substantially flat and horizontal rearward extension —a— and a seat —B— hingedly connected by sections —b— and —b’— to the extension —a— to swing vertically about a horizontal axis toward and from the top of the bowl —A—.

The ventilating device comprises a relatively broad but shallow pipe section —1— having the front end of its bottom cut away or opened so that the flanged side of said portion may rest flatwise upon the upper surface of the extension —a— of the bowl as shown more clearly in Figure 3, said sides being provided with oppositely projecting lugs or ears —2— having openings therethrough for receiving the hinge bolts —3’— which serve to clamp the section —1— to the extension —a— in addition to their other function of supporting the lid —5—.

The rear end of the section —1— is provided with bottom, top and side walls and is slightly deeper than the front and to form a shoulder —3— which abuts against the rear and face of the extension —a— to assist in holding the section —1— firmly in place.

When the section —1— is clamped in operative position upon the extension —a— the latter closes the opening in the bottom thereof, said extension being open at both ends to communicate with the interior of the bowl for ventilating purposes.

The section —1— is provided with a rearwardly extending pipe section —4— which may be cast integrally therewith or separately therefrom and afterward permanently secured thereto to form a continuation of the section —1— and for this purpose the front end of the section —4— is relatively broad and shallow to correspond with the rear end of the section —1— and is preferably hinged at 4’ to the section —1— to permit it to be adjusted and set to the most convenient angles.

This section —4— is deflected laterally mainly to one side of the section —1— and at an angle thereto for convenience of installation of the switch and damper operating mechanism presently described, the extreme rear end of the section —4— being cylindrical for receiving the adjacent end of a ventilating pipe section —5— which may be con-
nected with a draft flue or vent pipe—C— in the house or as shown, may be extended through the roof or to the exterior of any other portion of the house and thereby form a ventilating extension of the sections—1— and —4—.

The ventilator pipe—5— is continued upwardly above the upper floor or to the attic of the building where it is connected to one end of a suitable fan case—6— which is additionally supported from the roof, ceiling or rafters by a hanger or equivalent support—9— and has its other end connected to the vent pipe—C—.

This fan case is preferably disposed in a horizontal position for receiving and enclosing an electric motor—7— and a fan—8— which latter is direct-connected to the armature shaft of the motor to rotate about a horizontal axis, the motor being mounted up-on a bracket—10— on the interior of the case—6— in spaced relation to the walls thereof to allow for circulation of air through the case.

The motor—7— requires only a small amount of current which may be supplied from any available house-lighting or power circuit through suitable cables—12— leading through a nipple—11— on the fan case—6— to the motor and through the ventilating pipe—5— to a self-opening seat-controlled electric switch—13—.

The switch—13— is mounted in a suitable case—14— preferably on the under side of the pipe section—4— as shown more clearly in Figure 5 and comprises a pair of spring terminals—15— which are mounted upon an insulating block—16— within the case—14— and are connected to the cables—12— to cooperate with a moveable switch member for controlling the operation of the motor in a manner presently described.

Under this arrangement the fan will be operated only when the seat—b— is depressed by the owner and will remain at rest when the seat is raised, thereby conserving the current used in the operation of the motor—7—.

A switch operating plunger—17— is reciprocally movable horizontally in suitable guide openings in one end of the case—14— and insulating block—16— and has its inner end provided with a contact member—18— of electric conducting material adapted to be moved into and out of contact with the terminals—15— for closing and opening the motor circuit as the plunger is moved in opposite directions in the manner hereinafter described.

The plunger—17— and its switch member—18— are yieldingly held in their open positions by means of a coiled spring—20— between the outer face of the adjacent end of the case—14— and a shoulder—21— on the outer end of the rod—17— so that the motor switch is normally open, but is adapted to be closed automatically by the depression of the seat—B— toward the top of the bowl—A—.

For this latter purpose, a crank shaft—22— is journaled in suitable bearings—23— on one side of the front pipe section—1— to rock about a horizontal axis substantially parallel with the longitudinal center of the section—1— and has its front end extended forwardly some distance beyond the hinge section—b— and provided with a laterally outwardly and upwardly projecting crank arm—24— underlying and normally engaging the underside of the adjacent portion of the seat—B— some distance in front of the hinge pin as—b'— about which the seat is adapted to move.

The rear end of the crank shaft—22— is provided with a rearwardly, laterally and outwardly extending crank arm—25— along the adjacent side of the pipe section—4—.

The rear end of the crank arm—24— is provided with a laterally and inwardly offset—26— to which is connected one end of a tension spring—27— having its other end attached at—28— to the underside of the rear end of the pipe section—4— as shown more clearly in Figure 4.

A damper—29—, Figure 3, is mounted on the intermediate portion of a crank shaft—30— within the rear end of the pipe section—4— for regulating the passage of air and gases through said pipe, said shaft being journaled in the opposite side walls of the cylindrical portion of the pipe section—4— and is provided at one end with an external crank arm—31— which is connected by a link—32— to the offset portion—26— of the crank arm—25— for transmitting motion from the crank shaft—29—to the damper shaft—30— and vice versa.

The opposite end of the damper shaft—30— is provided with an external crank arm—33— extending across the outer end of the switch-operating plunger—17— in normally spaced relation thereto but adapted to engage and operate the plunger when the damper—29—is opened by the depression of the seat—B—.

The tension spring—27— serves the triple purpose of operating the damper shaft—30— to yieldingly hold the damper in its closed position and also to operate the crank shaft—22—to cause the crank arm—24—to normally hold the seat—B—in a slightly elevated position as shown in Figures 1 and 3 and also to hold the switch operating crank arm—33—in its inactive position.

A suitable stop bar—34— is adjustable secured by means of a clamping screw—35— to the underside of the pipe section—4— as shown more clearly in Figure 6 for engaging the crank arm—25—and thereby limiting the rocking movement of the crank shaft—136.
—22— by the spring —27— which incidentally limits the movements of the seat —B—, damper —29— and switch-operating member —33— leaving the seat —B— free to be further opened by hand independently of the crank arm —24—.

The switch box —14— is preferably made as a separate unit and secured by any suitable fastening means to the underside of the pipe section —4—, but obviously might be cast integral with said pipe section, if desired.

**Operation.**

Assuming that the seat —B— is resting normally upon the crank arm —24— of the crank shaft —33— and is yieldingly held in that position against its own weight by the tension of the spring —27— which is sufficiently strong for that purpose but is adapted to yield under additional pressure on the box as, for example, the occupant thereof.

Under these conditions, the motor —7— and fan —8— will be at rest and the switch —13— will be open to break the circuit to the motor.

Now, as the seat —B— is depressed by the user it will engage and depress the crank arm —24— thereby rocking the shaft —22— and its crank arm —25— away from the stop —34—.

This operation of the crank arm —25— from its normal position against the action of the spring —27— will rock the damper shaft —30— through the medium of the link —32— thereby opening the damper —29— and operating the crank arm —23— on the damper shaft against the outer end —21— of the plunger —17— for forcing the plunger inwardly to engage its contact member —18— with the terminals —15— of the motor circuit for operating the motor —7— and its fan —8— as long as the seat B remains depressed.

Immediately upon releasing the extra pressure or weight upon the seat —B— the spring —27— will restore the crank shaft —22— and damper shaft —30— to their normal positions thereby causing the crank arm —24— to elevate the seat —B— and at the same time the crank arm —25— will close the damper —29— and cause the withdrawal of the crank arm —33— on the damper shaft from engagement with the plunger —17— to allow the latter to be returned from its normal position by the retracting spring —20— thus opening the switch —13— and causing the stoppage of the motor —7— and fan —8—.

It is now evident that the motor —7— and fan —8— are operated only when the seat —B— is occupied thereby conserving the current energy and wear upon the motor and also breaking the circuit to the motor.

The electrical parts of the switch are entirely inclosed within the house —14— and are, therefore, protected from contact with external objects.

The construction and operation of the apparatus as described is particularly simple and highly efficient, but it is evident that various changes may be made in the structural details without departing from the spirit of this invention.

It will be observed that when the closet is not in use the damper —29— will be in a more or less closed position according to the angle to which it is set on the shaft —30— thereby reducing the normal natural draft and conserving the heat in the room in which the closet is located, it being understood that the damper may be adjusted and set on the shaft —30— or otherwise to any angle or degree of normal natural draft required.

What I claim is:

1. In a ventilating attachment for water closets having a bowl and a vertically movable seat, a ventilating pipe communicating with the interior of the bowl, a damper within in the said pipe, a crank shaft journaled on the pipe and provided with axially spaced crank arms, one of said crank arms constituting a yielding support for holding the seat in a normally elevated position, a spring operatively connected to the other crank arm for operating the shaft to cause the first named crank arm to elevate the seat, and means actuated by the second named crank arm for opening the damper when the first named crank arm is depressed.

2. In a ventilating attachment for water closets having a bowl and a vertically movable seat, a ventilating pipe communicating with the interior of the bowl, a damper within in the said pipe, a crank shaft journaled on the pipe and provided with axially spaced crank arms, one of said crank arms constituting a yielding support for holding the seat in a normally elevated position, a spring operatively connected to the other crank arm for operating the shaft to cause the first named crank arm to elevate the seat, a damper within in the pipe and means including a link operatively connected to the second named crank arm for opening the damper when the crank shaft is operated by the depression of the seat against the first named crank arm.

3. In a ventilating attachment for water closets having a bowl and a vertically movable seat, a ventilating pipe communicating with the interior of the bowl, a crank shaft having a crank arm normally engaged by the seat, a spring for operating the shaft and crank arm to cause the latter to normally hold the seat in a slightly elevated position, an electrically operated motor driven fan within in the ventilating pipe, an electric switch controlling the motor circuit, and means actuated by the crank shaft for closing the switches as the crank shaft is operated by the depression of the seat.
4. In a ventilating attachment for water closets having a bowl and a vertically movable seat, a ventilating pipe communicating with the interior of the bowl, spring-operated means for normally holding the seat in a slightly elevated position and depressible by the lowering of the seat from said position, a damper in the ventilating pipe, means actuated by the depression of said seat supporting means for opening the damper, an electric motor and a fan actuated thereby, both supported within the ventilating pipe, a normally open electric switch in the motor circuit, and means actuated by the damper operating means for closing the switch.

In witness whereof I have hereunto set my hand this 13th day of October, 1927.

KIRK S. BLANCHARD.