A. W. ARNOLD.

AUTOMATIC DRAFT CONTROLLER.

APPLICATION FILED JAN. 20, 1911.

1,067,777.

Patented July 15, 1913.

2 SHEETS—SHEET 1.

Fig. 1

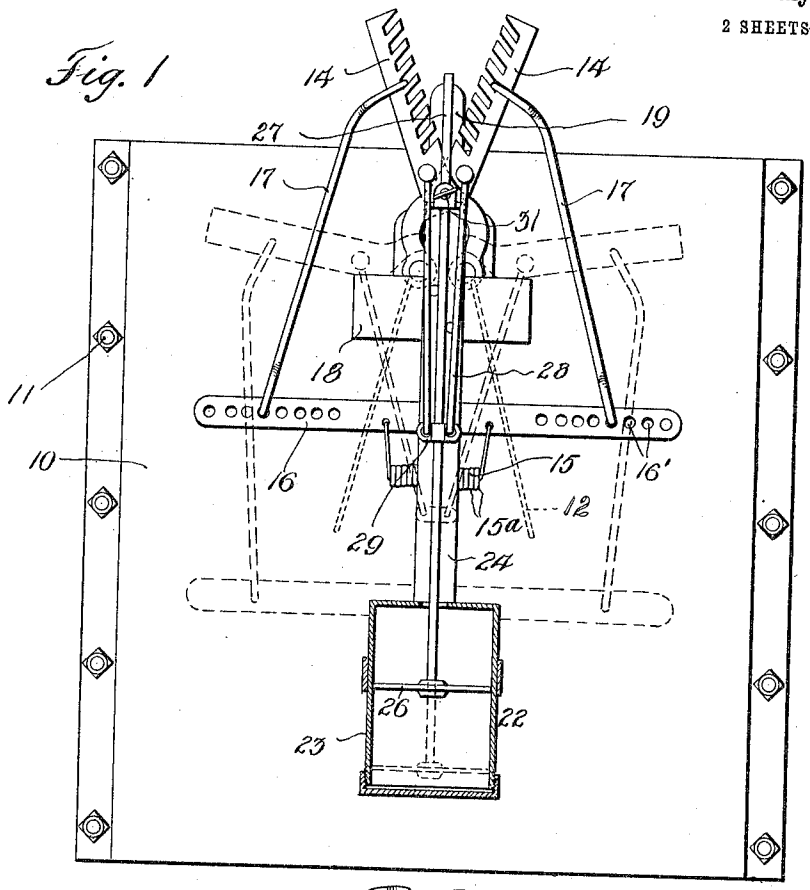
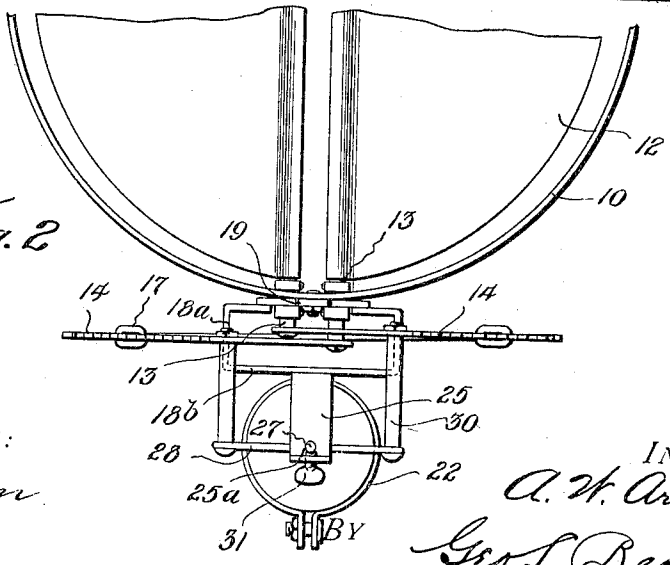


Fig. 2



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Fig. 3

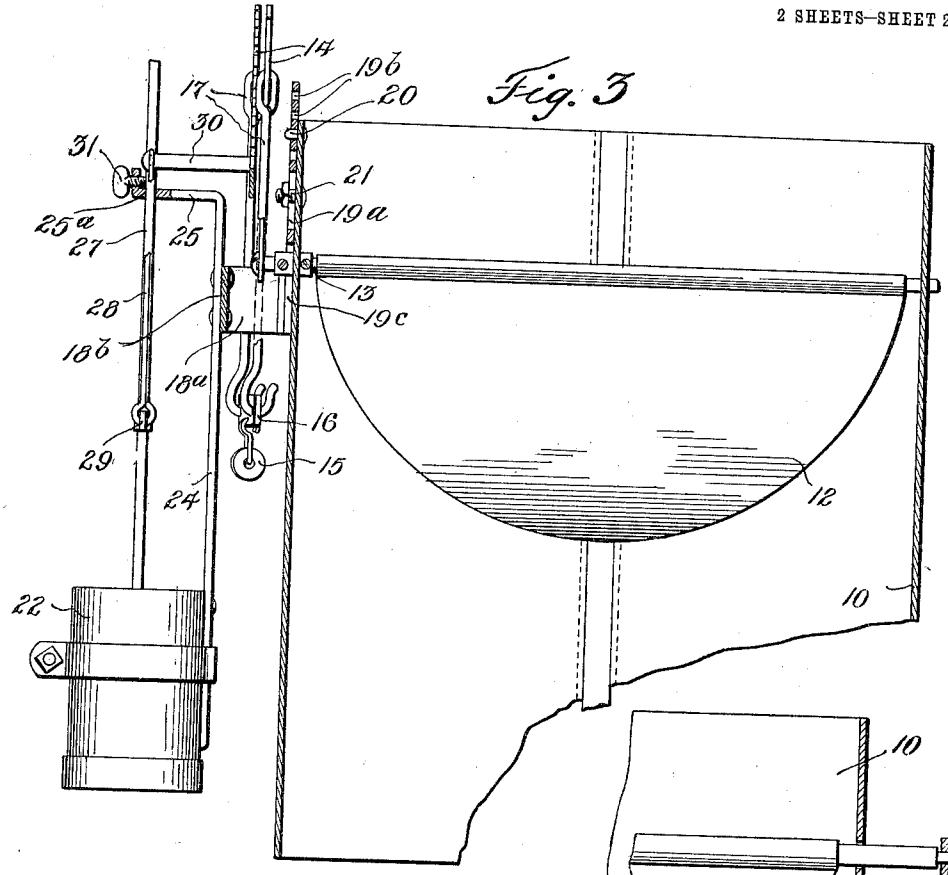


Fig. 6

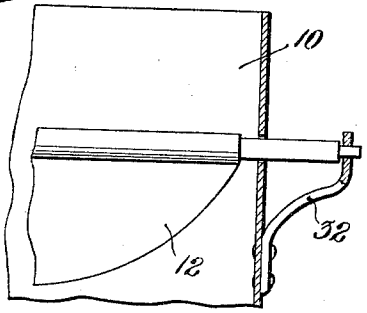


Fig. 4

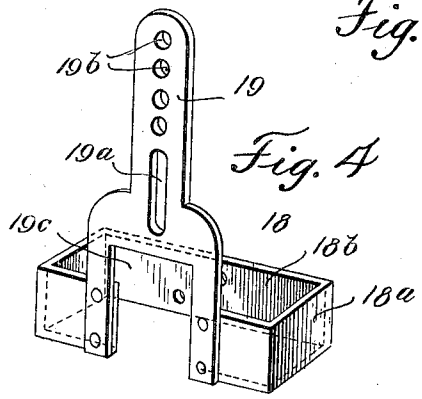
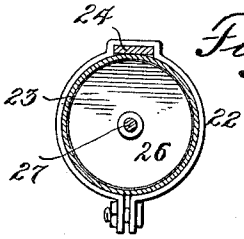


Fig. 5



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UNITED STATES PATENT OFFICE.

ARTHUR W. ARNOLD, OF NEW YORK, N. Y.

AUTOMATIC DRAFT-CONTROLLER.

1,067,777. Specification of Letters Patent. Patented July 15, 1913.

Application filed January 20, 1911. Serial No. 603,651.

To all whom it may concern:

Be it known that I, ARTHUR W. ARNOLD, a citizen of the United States, residing at New York, in the county and State of New York, have invented a new and useful Automatic Draft-Controller, of which the following is a specification.

This invention relates generally to that type of devices described and claimed in Letters Patent of the United States issued on the 20th day of September, 1910, to Safety and Economy Damper Company, Nos. 970,598 and 970,599, at my request, and consists particularly of the novel devices and combinations hereinafter fully described and claimed, and illustrated in the accompanying drawings, in which—

Figure 1 is a front elevation; Fig. 2 is a plan view of the principal parts of the same; Fig. 3 is a transverse vertical section; Fig. 4 is a rear perspective view of the bumper; Fig. 5 is a plan view of the dash pot, and Fig. 6 is a detail of a modified form of bearing.

Throughout the following description and on the several figures of the drawings similar parts are referred to by like reference characters.

The main support for the device of controller comprises a shell or casing 10, of any suitable construction, and which may be secured to any flue out through which hot products of combustion are adapted to pass, but it will be understood that in some instances the shell may be the flue structure itself. When the shell is an element separate from the flue, it may be secured to the flue in any convenient manner, as by separable fastenings 11. The shell or flue may be of any suitable form in cross section, either circular, elliptical, or angular.

The controller comprises one or more wings 12 movable within the shell on as many axes 13 extending transversely of the shell, the shafts or axes 13 being journaled in bearings on opposite walls of the shell. Since the shafts have bearing points independent of each other on the shell only, there is no possibility for any deposit or clogging, preventing intended free movement of the wings. While two such shafts and attached wings are shown, it is obvious that in certain forms of flues a single shaft and wing might be employed in preference. As shown each shaft has rigidly, though preferably removably, connected thereto an arm 14, which projects from the shaft in practically the plane of the wing of the same, so that when the controller is open the wings are close together on one side of their axes and the arms are close together on the other side.

Counterweight means of any suitable nature may be connected to either or both of the aforesaid arms 14. As shown said means comprises a weight 15 of variable heft combined with or suspended from a bar 16 extending horizontally to a considerable distance on both sides of the weight 15, the bar in turn being connected to the arms 14 by links 17. By virtue of the foregoing counterweight connections it is feasible and frequently desirable to so adjust the links 17 to the bar 16 and arms 14 that the wings and arms may be practically vertical or in line with the axis of the flue and yet provide that a very light draft will cause the wings to swing apart toward their closed position. The links being connected to the bar at points far distant from the middle, their pull on the arms, even when the arms are close together, may be approximately at right angles thereto, and as the bar moves downwardly bodily and the arms swing through arcs of circles it is possible for said links to continue pulling upon the arms in substantially the same direction as at first. Under these conditions the weight is practically as effective on the arms when they are upright as when they approach their horizontal position. This will provide for wide-open wings and at the same time insure quick and certain operation of the controller even under the influence of a light draft. The effective leverage of each arm may be varied by adjusting the link toward or from its center of oscillation, and the direction of pull from the bar to the arm may be varied by shifting the point of connection of the link along the series of holes or notches 16′. The weight 15 is shown as comprising individual removable weight elements 15^a, as one means to vary the heft thereof.

The extent of closing movement of the controller wings may be determined in any suitable manner, to provide for more or less free flue space when the wings are closed as far as they may go for any particular adjustment. I provide in this instance a bumper 18 rigidly connected to the shell 10 and comprising parts of stops 18[a] extending outwardly into the path of and adapted to be impinged by the arms 14. The bumper post 19 is provided with a slot 19[a] and a series of alined holes 19[b], and also with a space 19[c] to accommodate the shafts 13. To secure the bumper to the shell a stud 20 engages in any of said holes, and a bolt 21 passing through the slot clamps the bumper rigidly in place at any desired distance from the shafts 13 and hence so as to vary the swing of the arms and wings.

The above-described peculiar relation between the arms 14 and the counterweight means provides a very easy and free movement of the wings. There is a tendency, therefore, for the impact between the arms and the stops to be objectionably noisy, especially, as I have observed in extensive practice, when the wings are subjected to irregular outside atmospheric conditions. To meet and obviate this tendency in a cheap, compact, and effective manner I provide cushioning means, shown herein as a dash pot 22 associated with the arms 14. The cylinder 23 may conveniently be secured to the cross bar 18[b] of the bumper by means of a stem 24, the upper end of which is bent outwardly at 25 and provided with a guide hole 25[a]. The bottom of the cylinder is closed, and the piston 26 operates toward and from the same with a sufficiently close fit to prevent too rapid movement of the arms and wings, the piston rod 27 being connected to the arms through links 28 attached to the piston rod at 29 and pivoted to a pair of studs 30 extending outwardly from the arms sufficiently far to permit free movement of the piston rod and links 28 in a plane parallel to the plane of the arms and counterweight means. By supporting the dash pot from the bumper ample free space is provided for operation of the weight, and since the bottom is the effective end of the cylinder it maintains a practically uniform relation to or distance from the lower limit of movement of the arms 14 in all adjustments of the bumper. The upper end of the piston rod 27 being guided in the hole 25[a] there is no possibility of binding of the piston due to uneven pulls or thrusts on the links 28. Obviously any convenient variation in the form of bumper may be employed, and the dash pot may be otherwise supported than on the bumper structure.

In some instances it is desirable to lock the wings temporarily from operation, and to accomplish this I show at 31 a thumb screw which may be turned so as to bind upon the piston rod 27 and thereby hold the same, and hence the wings, in any desired position.

Fig. 6 illustrates a modified form of bearing, comprising an arm or bracket 32 carried by the shell or flue and extending outwardly therefrom to a considerable distance, whereby the actual bearing points may be spaced well from the heat and may be of a more delicate nature than would be possible otherwise. I employ this form of wing support especially in the larger stack structures, and hence provide practically anti-friction bearings for the same.

Having thus described a preferred embodiment of the invention, but intending not to be limited thereto except as may be required by the prior art, I claim:

1. The hereindescribed automatic draft controller comprising, in combination, a pivoted wing, an arm connected thereto, a counterweight of variable heft connected to the arm, a bumper to limit the extent of movement of the arm and counterweight, and cushioning means connected to said arm to govern its rate of movement and impact against the bumper.

2. The hereindescribed automatic draft controller comprising, in combination, a pair of wings, a pair of arms, counterweight means of variable heft connected to the arms, a bumper adapted to be impinged directly by the arms to limit the extent of movement of the arms, and a dash pot to regulate the force of the impact of said arms upon the bumper.

3. The hereindescribed automatic draft controller comprising, in combination a pair of wings movable on parallel axes, a pair of arms connected thereto and crossing each other, a dash pot connected to the arms to control their speed of movement, and variable counterweight means associated with the dash pot and arms.

4. The hereindescribed automatic draft controller comprising, in combination, a pivoted wing, an arm rigidly connected thereto, a counterweight connected to the arm, a bumper to limit the swing of the arm and wing, and a dash pot carried by the bumper and connected to the arm to govern its rate of movement and force of its impact against the bumper.

5. The hereindescribed automatic draft controller comprising, in combination, a pivoted wing, an arm connected thereto, a counterwieght connected to the arm, an adjustable bumper to variably limit the swinging movement of the arm and wing, and a dash pot carried by the bumper and adjustable therewith to govern the rate of movement of the arm.

6. The hereindescribed automatic draft controller comprising, in combination, a pair of wings, a pair of arms connected thereto and extending approximately oppositely therefrom, counterweight means comprising a long horizontal bar, a pair of links extending from widely separated points near the ends of said bar to said arms, and means to control the extent of movement of the arms.

ARTHUR W. ARNOLD.

Witnesses:
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Copies of this patent may be obtained for five cents each, by addressing the "Commissioner of Patents, Washington, D. C."