

July 4, 1939.

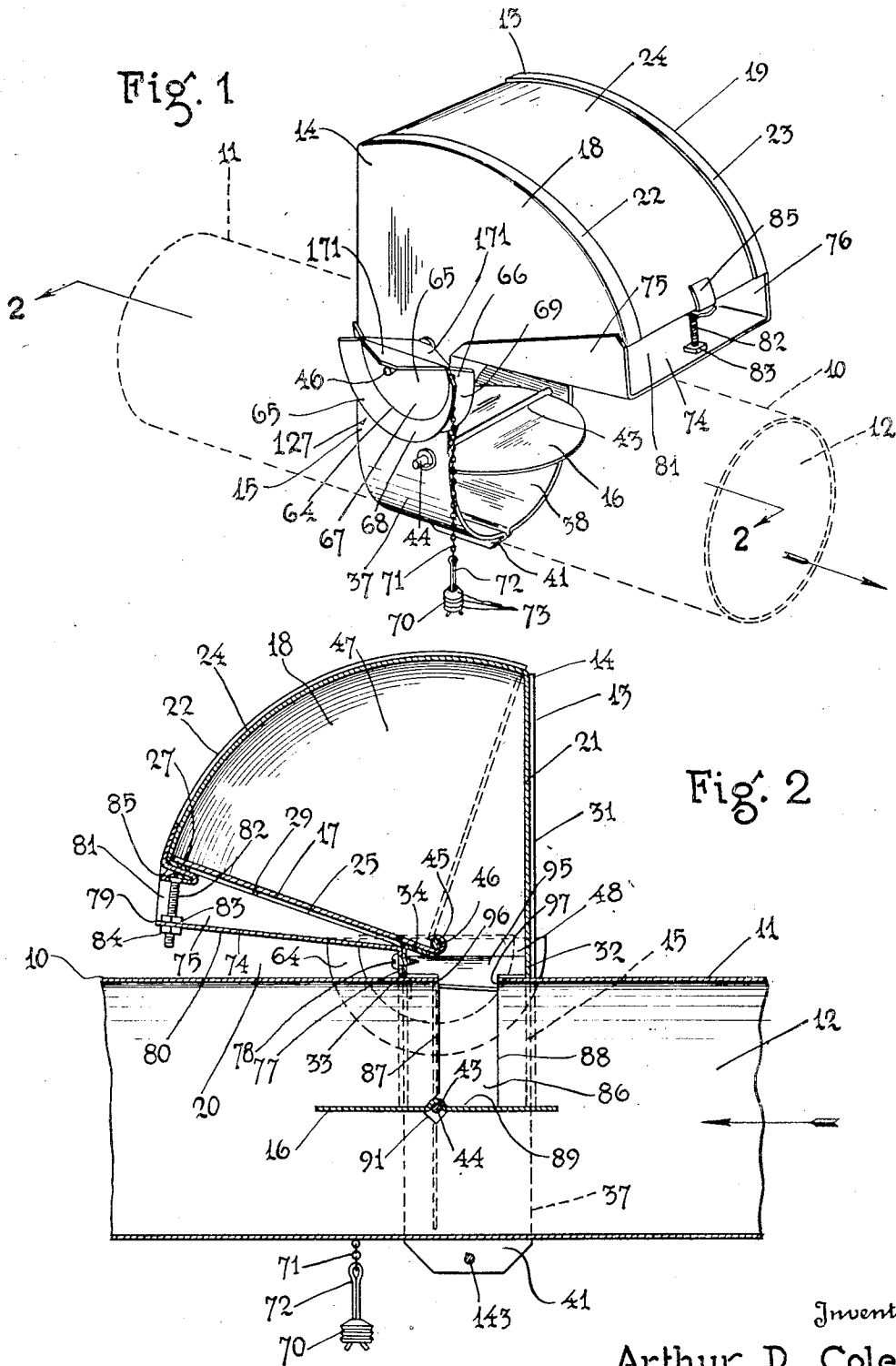
**A. D. COLE**

**2,164,607**

## DAMPER CONTROL

Filed Aug: 26, 1935

2 Sheets-Sheet 1



Inventor

Arthur D. Cole

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A. D. COLE

2,164,607

DAMPER CONTROL

Filed Aug. 26, 1935

2 Sheets-Sheet 2

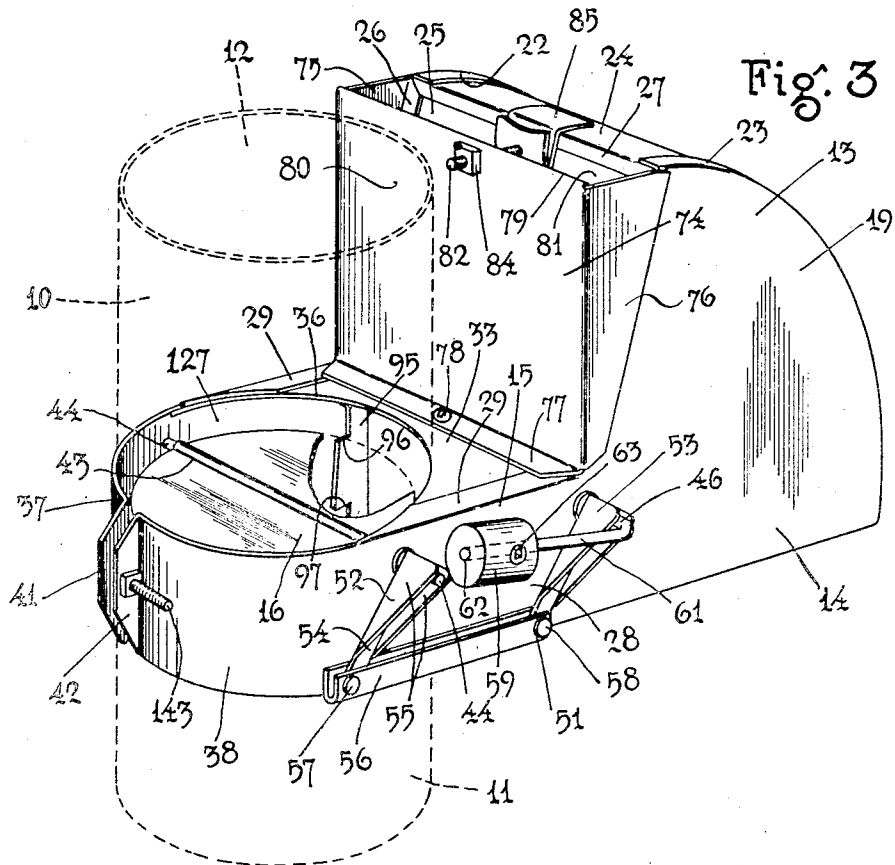


Fig. 3

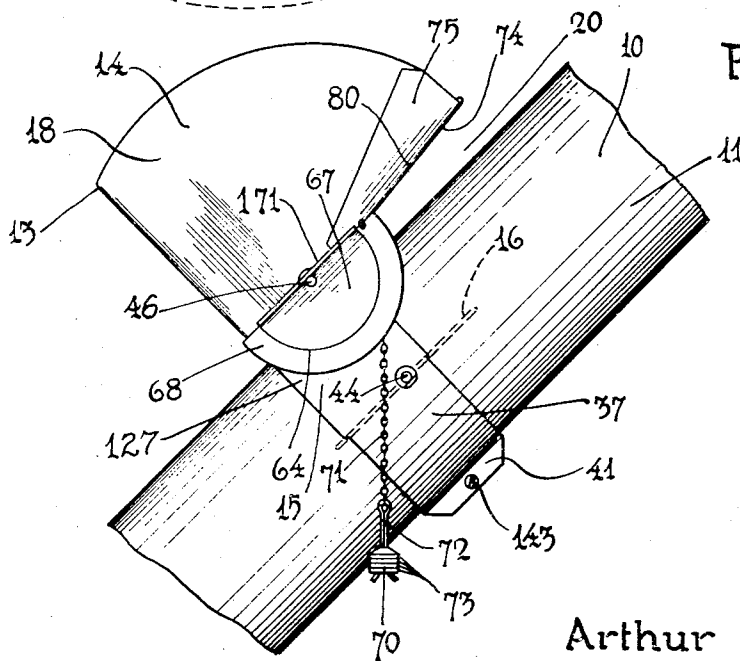


Fig. 4

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## UNITED STATES PATENT OFFICE

2,164,607

## DAMPER CONTROL

Arthur D. Cole, Minneapolis, Minn.

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16 Claims. (Cl. 236—45)

My invention relates to dampers and damper controls and more specifically to draft regulators.

An object of the invention resides in providing a draft regulator, particularly adapted to be installed in existing smoke pipes without removal or dismantling of the stove pipe or replacement of any of the sections thereof.

A still further object of the invention resides in providing a draft regulator which may be installed in a vertical horizontal or inclined stove pipe without reconstruction or rearrangement of the parts of the regulator.

Another object of the invention resides in providing a draft regulator which cannot be improperly installed.

An object of the invention resides in providing a draft regulator having a damper adapted to be inserted into the pipe through a relatively narrow circumferential opening in the pipe.

A feature of the invention resides in providing a draft regulator having a case, a damper and a vane for operating the damper both disposed within the case, said damper being pivoted at both ends to the case and being adapted to be inserted into the pipe in which the device is to be installed.

Another object of the invention resides in providing a linkage connected to the vane and damper for operating the damper, said linkage being disposed exteriorly of the case.

An object of the invention resides in providing a damping device for preventing hunting or wagging of the control vane when changes in draft occur.

A still further object of the invention resides in providing a construction by means of which adjustment of the damping device may be procured.

Another object of the invention resides in constructing the damping device in the form of a shield adapted to cover the opening between the case and the exterior, whereby the flow of air into or out of the device through said opening may be controlled.

A feature of the invention resides in providing an angular space or corner between the pipe and the case in which the said shield is disposed.

An object of the invention resides in constructing the case with a neck having parallel side walls spaced apart substantially the diameter of the pipe and adapted to be tangent to the pipe when the device is installed, said neck also having top and bottom walls constructed with arcuate edges adapted to fit against the pipe upon the exterior thereof.

Another object of the invention resides in providing extensions on the side walls of the neck adapted to be bent about the pipe and in further providing clamping means at the ends of the extensions for drawing the same together for the

purpose of causing the case to fit upon the pipe and for holding the case attached to the pipe.

An object of the invention resides in arranging the opening in the pipe through which the damper is inserted in a manner such that the damper never passes the edges of the opening when the damper is swung about its axis, thereby preventing catching of the damper on the edges of the pipe adjacent the opening therein and maintaining the damper throughout its movement within the confines of the pipe.

Another object of the invention resides in providing a strut between the walls of the neck having the arcuate slots for stiffening the same, said strut having shoulders thereon for engagement with the edges of the pipe at the opening therein, said shoulders serving to locate the device relative to the opening and to reinforce the pipe.

A still further object of the invention resides in constructing the movable parts of the invention so that the same are at all times balanced, whereby inaccuracies in the operation of the device are entirely eliminated.

A feature of the invention resides in utilizing with the invention a drum semi-circular in form to which a weighted flexible member is attached.

An object of the invention resides in the specific construction of said drum.

An object of the invention resides in providing a device which will not be affected by the accumulation of soot and scale within the pipe.

Other objects of the invention reside in the novel combination and arrangement of parts and in the details of construction hereinafter illustrated and/or described.

In the drawings:

Fig. 1 is a perspective view of a draft regulator illustrating an embodiment of my invention and applied to a horizontally extending pipe.

Fig. 2 is a longitudinal sectional view taken on line 2—2 of Fig. 1.

Fig. 3 is a view similar to Fig. 1 showing the draft regulator applied to a vertically extending pipe and viewed from the opposite side of the regulator.

Fig. 4 is an elevational view of the regulator, showing the regulator mounted on an inclined pipe.

My invention may be used in conjunction with any device or apparatus through which the flow of a gas occurs and in which the regulation of flow of such gas is desired. A common use of the invention is in conjunction with smoke pipes of heating plants and for the purpose of simplification, the following description of the invention will be confined to draft regulators to be used in conjunction with heating plants, though it can readily be comprehended that other applications of the invention are contemplated.

For the purpose of illustrating the application

of my invention, I have shown a section of pipe which is indicated in Figs. 1 and 3 of the drawings in dotted lines and designated by the reference numeral 10. This section of pipe forms a part of the smoke pipe of a heating plant with which the invention is to be used. The wall of the smoke pipe is indicated by the reference numeral 11 and the passageway therethrough by the numeral 12. The flue gas flows through the passageway 12 from left to right as viewed in Fig. 1.

The draft regulator proper comprises a case 13 which supports all of the operating parts of the regulator and which is bodily applicable to the smoke pipe 10 and which may be attached thereto in an extremely simple and expedient manner. The case 13 is formed with a body portion 14 and a neck 15 issuing outwardly therefrom. The neck 15 extends up to and is attached to the smoke pipe 10 while the body portion 14 projects outwardly from the smoke pipe and is spaced with respect thereto to provide a corner or angle 20 therebetween. Pivoted to the wall structure of the neck 15 is a damper 16 which is disposed within the passageway 12 of smoke pipe 10 and which is adapted to control the flow of gas through said passageway. Within the body portion 14 of case 13 is disposed a vane 17 which is subject to the pressure within the passageway 12 and which functions to operate the damper 16. These various parts will now be described in detail.

The body portion of case 13 comprises two spaced side walls 18 and 19 which are of the shape of a segment of a circle. These two walls are parallel to one another and are attached to a radial wall 21 which extends completely across the case. The walls 18 and 19 are provided at the arcuate edges thereof with inwardly turned arcuate flanges 22 and 23. A curved or arcuate wall 24 is secured to the flanges 22 and 23 and is integral with the wall 21. The case 13 is open at the portion thereof opposite the radial wall 21, the opening through said case being designated by the reference numeral 25. At the marginal edges of this opening are provided flanges 26 and 27 which are turned inwardly from the walls 18 and 19 and the wall 24.

The neck 15 comprises spaced side walls 127 and 28 which lie in continuation of the walls 18 and 19 of the body portion 14 and which are preferably constructed of the same sheets of material from which the said walls 18 and 19 are constructed. These walls have inwardly turned flanges 29 and 31 at the top and bottom thereof, the flanges 31 extending along walls 18 and 19 and being integral therewith. Attached to these walls are parallel radial walls 32 and 33. The wall 32 forms a continuation of the wall 21 of the body portion 14 of the case and is preferably constructed of the same sheet of material as said wall. The wall 33 is constructed of a separate sheet and is provided with an inwardly turned flange 34, the purpose of which will be subsequently more fully explained. This flange lies in the plane of the flanges 26 and 27 of the arcuate and side walls of the body portion 14 of the case 13.

The two walls 32 and 33 are constructed with arcuate edges 36 which are of the same curvature as the pipe 10 and are adapted to fit or seat against the wall 11 of said pipe. The width of the walls 32 and 33 and the arcuate wall 24 of the body portion 14 of the case is exactly equal to the external diameter of the pipe so that when

the case is applied to the pipe, as shown in the drawings, the two side walls 127 and 28 lie tangent to the pipe. On the two side walls 127 and 28 are formed two extensions 37 and 38 which are adapted to be bent about the pipe when the same is applied thereto. These extensions have bent outwardly therefrom flanges 41 and 42 which are spaced from one another. A bolt 143 passes through these flanges and serves to draw the flanges together to tension the said extensions for the purpose of causing the case to fit the pipe and to securely hold the regulator attached to the pipe.

For the purpose of reinforcing the neck 15 of the case 13, I utilize one or more struts 95 which extend between the walls 32 and 33 of said neck and which are welded or otherwise secured thereto. These struts are disposed at the periphery of the arcuate edge 36. On the struts 95 are formed shoulders 96 and 97 which extend inwardly into the pipe proper. These shoulders serve a purpose to be subsequently referred to.

Within the neck 15 and within the pipe 12 is mounted the damper 16. This damper consists of a disk constructed of sheet metal and of a diameter slightly less than the internal diameter of the pipe. This disk is formed at its center with a diametrically extending groove 43. A shaft 44 is disposed within said groove and the said damper is welded to the shaft at suitable intervals along said shaft. Shaft 44 is journaled in the two side walls 127 and 28 of neck 15 and extends outwardly beyond the same. By means of this construction the damper may swing from the position shown in Fig. 1 to that shown in Fig. 3.

Within the body portion 14 of the case 13 is mounted the vane 17. This vane consists of a rectangular sheet of metal provided at one end with a beaded portion 45. A shaft 46 is disposed within said beaded portion and is welded thereto the same as the shaft 44 is secured to damper 16. Shaft 46 extends through the side walls 18 and 19 of the body portion 14 of case 13 and is journaled therein. The arcuate wall 24 of the case 13 is concentric with the axis of the shaft 46 and the two walls 18 and 19 are at right angles to said shaft so that the vane 17 may swing from the full line position shown in Fig. 2 to the dotted line position and during such movement is in close proximity to the edges of the case so as to prevent appreciable leakage of air past the vane. The flange 34 on the radial wall 33 of neck 15 and the flanges 26 and 27 on the walls 18, 19 and 24 of the body portion 14 of the case serve as stops for limiting the movement of the vane 17 outwardly. Movement of the vane in the opposite direction is limited by the radial wall 21 which the vane engages as shown in dotted lines in Fig. 2.

By means of the particular construction of the case 13 a compartment 47 is formed within the interior of the body portion 14 and in which the vane 17 is movable. This compartment communicates through a passageway 48 in neck 15 with the passageway 12 of the smoke pipe 10. In operation the surface of the vane facing the interior of the case is subject to the pressure within the pipe 10 and serves to control the operation of the regulating device.

For operating the damper 16 a linkage is used which is indicated in its entirety by the reference numeral 51. This linkage comprises two cranks 52 and 53 which are attached to the shafts 44 and 46. Both cranks 52 and 53 are constructed

in the same manner and only the construction of crank 52 will be described in detail. This crank is constructed from sheet metal and is formed with an elongated body portion 54 from which issue two wings 55. The shaft 44 extends through the body portion 54 and the wings 55 are welded to the said shaft. Cranks 52 and 53 are connected together by means of a U-shaped link 56 which is pivoted to the said cranks through rivets 57 and 58 passing jointly through the link 56 and the corresponding crank. The two cranks 52 and 53 are exactly the same length and the distance between rivets 57 and 58 of link 56 is equal to the distance between the shafts 44 and 45 so that the linkage 51 is always balanced and the damper and vane will never be thrown out of balance regardless of the position of said linkage.

Inasmuch as the damper 16 is attached medially to the shaft 44 the same is at all times balanced. The vane 17 being attached along an edge to the shaft 46, a counterweight 59 is utilized for counterbalancing said vane. Shaft 46 is provided at its end with an arm 61 which is bent outwardly therefrom and to which the said counterweight is attached. The counterweight is formed with a bore 62 for the reception of said arm and may be slid longitudinally along said arm to vary its distance from the center of the shaft 46. A set screw 63 threaded into the counterweight holds the same in adjusted position upon the arm 61. Arm 61 lies in the plane of the vane 17 so that said vane is perfectly balanced.

For the purpose of providing suitable resisting force to counteract the pressure of the flue gas against the vane 17, whereby regulation of the draft is procured, a construction is employed which is best shown in Fig. 1. Attached to the end of the shaft 46 protruding through the wall 18 of case 13 is a drum 64. This drum is constructed in the form of a semi-circular sheave. Drum 64 is constructed in two halves 65 and 66 formed of sheet metal pressed in the desired shape. These halves are provided with planiform semi-circular portions 67 and with outwardly flaring annular portions 68. When the two halves are placed together with the semi-circular portions 67 in contact, the flared portions 68 form a groove 69 therebetween. The said halves are further constructed with outwardly turned flanges 171 which lie in the same common plane and in a plane parallel with the axis of the drum. Shaft 46 extends through the portions 67 and is welded to the two flanges 171. The drum 64 has attached to it at one end of the groove 69 a chain 71, which chain has secured to the other end thereof a split cotter pin 72. A number of washers 73 mounted on this cotter pin form a weight 70 which provides the resisting force.

For the purpose of damping the action of the vane 17 and to prevent hunting or wagging of said vane when the pressure with the smoke pipe varies, a shield 74 is employed. This shield consists of a sheet of metal which is constructed with a body portion 80 adapted to overlie the opening 25 in the case 13. Said shield is further constructed with wings 75 and 76 which extend outwardly therefrom and embrace the two side walls 18 and 19 of the body portion 14 of the case. At the inner end of the body portion 75 of shield 74 is a flange 77 which is secured to the radial wall 33 of neck 15 of the case through a sheet metal screw 78. The outer edge 79 of the shield 74 is free and is spaced from the flange 27 to provide an opening or outlet 81 which is in

communication with the portion of the chamber 47 on the exterior of the vane 17 through the opening 25. By moving the shield 74 toward and from the case 13, the dimensions of the outlet 81 can be varied and the resistance to the flow of air into the compartment 47 through the opening 25 can be adjusted. The shield 74 is held in adjusted position by means of a bolt 82 which extends through said shield. Two nuts 83 and 84 on said bolt hold the shield in proper position. Bolt 82 is attached to a clip 85 which is welded to the wall 24 of the case.

The manner of installing my invention is as follows: For the purpose of explanation, it is assumed that the pipe 10 is so arranged that the chimney is connected to the left as viewed in Fig. 2 and the heating plant to the right. At the desired locality in the pipe 10 where the regulator is to be installed, a circumferentially extending slot 86 is cut. This slot is relatively narrow, being bounded by two circumferentially extending edges 87 and 88 and two edges 89 extending along elements of the pipe and situated substantially diametrically opposite one another though slightly toward one side of the diametral plane. At the corners formed by the edges 87 and 89 are cut notches 91. After the pipe has been so cut and the slot 86 and notches 91 formed, the draft regulator is arranged with the damper 16 disposed as shown in Fig. 3 and with the extensions 37 and 38 lying in the planes of the walls 127 and 28 of the case. The device is then slid into place with the two extensions 37 and 38 straddling the pipe. As the device is applied the struts 95 are inserted into the slot 86 of the pipe and the shoulders 96 and 97 brought into engagement with the edges 87 and 88 thereof. The device is finally brought toward the pipe until the arcuate edges 36 of the radial walls 32 and 33 seat against the wall 11 of the pipe. When this occurs, shaft 44 is disposed in notches 91. The two extensions 37 and 38 are then bent about the pipe and the bolt 143 inserted through the flanges 41 and 42 and said bolt tightened up. This attaches the regulator to the pipe and holds the same securely applied thereto. The regulator is now ready for use.

In the use of the regulator it is merely necessary to adjust the weight 70 applied to the drum 64 by changing the number of washers 73 mounted on cotter pin 72. In normal position when the draft is a minimum, the damper and vane occupy the position shown in full lines in Fig. 2. As draft increases the suction in the pipe increases and exerts a pull upon the vane 17, which swings the vane to the right. Such action is in opposition to the force produced by the weight 70. The swinging of the vane 17 causes swinging of the damper 16 toward the position shown in dotted lines in Fig. 2, which tends to cut off the flow of flue gas through the pipe and to reduce the draft. Vane 17 stops at an intermediate position when a balance has been procured. The shield 74 is adjusted so that the outlet 81 is a maximum with no hunting or wagging of the vane 17. Should such hunting commence the shield 74 is moved closer to the case and the area of the outlet 81 reduced. If the draft in the smoke pipe decreases the force is reduced and the weight 70 tends to swing the vane 17 toward its full line position. This opens the damper and allows more flue gas to flow through the tube so that the draft through the smoke pipe remains the same. When the damper reaches its dotted line position, the same engages shoulder

96 of strut 95 which serves as a stop for limiting the movement thereof.

By arranging the shaft 46 in close proximity to the inlet 15 and the arcuate wall 24 remote from said inlet, a construction is provided which will not be affected by the accumulation of soot and scale within the pipe. When the device is on a horizontal pipe as shown in Fig. 2, the vane 17 throws the soot and scale back into the pipe every time the vane reaches the dotted line position. Changes in the weight of the vane through accumulation of soot and scale hence cannot occur when the device is thus installed. When the device is installed on a vertical or inclined pipe, as shown in Figs. 3 and 4, the vane is subjected on its under side to the flue gases and hence cannot collect soot and scale. In neither installation is the curved wall 24 so disposed as to permit of accumulation of soot thereon. None of the walls along which the vane travels can hence collect soot or scale to obstruct movement of the vane and the device will hence function indefinitely without attention.

My invention is highly advantageous in that a simple and practical construction is provided which may be readily and quickly attached to an existing smoke pipe without dismantling or replacing any of the sections thereof. The device requires an extremely small amount of space longitudinally along the pipe and can hence be installed in crowded quarters as, for example, on a section of an elbow or in a very short length of pipe. The slot in which the damper is positioned is extremely narrow and does not greatly weaken the pipe. By means of the struts employed, both the pipe and the case are reinforced. The shoulders and struts used with my invention serve to locate the case with respect to the pipe so that the device cannot be incorrectly applied. The shaft carrying the damper is supported at both ends so that an extremely sturdy construction is provided. All of the linkage for the invention is disposed upon the exterior of the case, thereby preventing accumulation of soot or scale upon the same and changing the operation of the regulator. By means of the semi-circular drum employed it becomes impossible to install the device incorrectly. If the chain can be made to ride within the groove of the drum the device will function.

Changes in the specific form of my invention, as herein disclosed, may be made within the scope of what is claimed without departing from the spirit of my invention.

Having described my invention, what I claim as new and desire to protect by Letters Patent is:

1. In combination with a cylindrical pipe having a semi-circular opening therein and formed with parallel circumferential edges bounding said opening, a draft regulator including a case adapted to fit about the pipe and covering said opening, said case including spaced transverse walls, said walls being formed with arcuate edges adapted to fit against the pipe, a strut between said walls and disposed in proximity to said arcuate edges, and shoulders formed on said strut for engagement with the circumferential edges of the pipe, said shoulders restraining longitudinal movement of the case with respect to the pipe, and means for holding the case attached to the pipe.

2. In combination with a cylindrical pipe having a semi-circular opening therein and formed with parallel circumferential edges bounding said opening, a draft regulator including a case adapted to fit about the pipe and covering said open-

ing, said case having transverse walls constructed with arcuate edges adapted to fit against the pipe and being further constructed with side walls connected to said transverse walls and tangent to the pipe, a shaft journaled at its ends in said side walls and extending across the pipe, a strut between said transverse walls and positioned in proximity to said arcuate edges, said strut having a portion extending into the pipe and a damper carried by said shaft, said portion of the strut forming a stop for limiting the movement of said damper.

3. A draft regulator comprising a case, two shafts arranged in parallel relation and pivoted to said case, a damper attached at its center to one of said shafts, a regulating vane carried by one of said shafts, means for counterbalancing said regulating vane, cranks connected to said shafts and extending outwardly therefrom in parallel relation, said cranks being of the same length, and a link pivoted to said cranks, said link being of the same length as the distance between said shafts.

4. In combination with a cylindrical pipe having a semi-circular opening therein and formed with parallel circumferential edges partially bounding said opening and being formed with edges disposed substantially at diametrically opposite lines extending along elements of the pipe and further bounding said opening and being further formed with notches at opposite corners of said opening, a case adapted to fit about the pipe and covering the opening, a shaft extending across said case and disposed within said notches, and a damper mounted on said shaft and adapted to swing in one position parallel to two of the circumferential edges and in another position at right angles thereto and parallel to the second named edges, said damper in both extreme positions being within the confines of the pipe and being free from said opening.

5. In combination with a pipe, a draft regulator including a case having a chamber therein, a damper within the pipe, a vane within said chamber means actuated by said vane for operating said damper, said vane on one side thereof being subject to the pressure within the pipe and on the other side thereof subject to atmospheric pressure, and a movable member connected to said case and forming in conjunction therewith a variable opening for damping the movement of said vane.

6. In combination with a pipe, a draft regulator including a case having a chamber therein, a damper within the pipe, a vane within said chamber means actuated by said vane for operating said damper, said vane on one side thereof being subject to the pressure within the pipe, said case having an opening on the opposite side of said vane and said vane on such side being subject to atmospheric pressure, a shield guarding said opening, said shield being pivoted to said case along an edge of said opening and having wings thereon fitting against the sides of the case, said shield being spaced from the case at the edge thereof opposite said pivoted edge to form an outlet communicating with the chamber within said case upon the atmospheric side of the vane, and means for holding said shield in adjusted position with respect to the case.

7. In combination, a pipe, a case applied to said pipe and having a segmental shaped portion extending outwardly from the pipe and spaced therefrom to form a corner therebetween, a vane within the segmental shaped portion of said case,

said case being open on the side thereof facing said pipe, and a shield applied to such portion of the case and disposed within said corner, means for guiding said shield for movement toward and from the case, and means for holding the shield in adjusted position with respect to the case.

8. A draft regulator comprising a case, two shafts arranged in parallel relation and pivoted to said case, a damper attached to one of said shafts, a vane attached to the other of said shafts, linkage between said shaft and vane, a semi-circular drum secured to one of said shafts with the diametral portion thereof substantially parallel with said damper, an elongated flexible member wrapped about said drum and a weight secured to the end of said member.

9. A draft regulator comprising a case, two shafts arranged in parallel relation and pivoted to said case, a damper attached to one of said shafts, a vane attached to the other of said shafts, linkage between said shaft and vane, a semi-circular drum secured to one of said shafts, said drum being constructed from two sheets of metal having outwardly flaring circular portions forming in conjunction a V-shaped groove and having flanges at the diametral portions thereof extending outwardly in opposite directions, said shaft extending through said drum in proximity to said flanges and being welded to said flanges, a flexible member secured to said drum and adapted to be wrapped about said groove and a weight attached to the end of said flexible member.

10. In combination with a cylindrical pipe having an opening therein, a draft regulator including a case adapted to fit about the pipe and covering said opening, said case including spaced transverse walls, said walls being formed with arcuate edges adapted to fit against the pipe and a strut extending between said walls and disposed in proximity to said pipe with an edge of said strut substantially at the arcuate edges of said transverse walls.

11. In combination with a pipe, a draft regulator including a case having a chamber therein, a damper within the pipe, a vane within said chamber, means actuated by said vane for operating said damper, said vane on one side thereof being subject to the pressure within the pipe, said case having an opening subjecting the other side of the case to atmospheric pressure, a valve member movable relative to said opening for controlling the movement of air by said vane through said opening, and means for holding said valve member in adjusted position with respect to said case.

12. A draft regulator for application to a pipe, said regulator comprising a case having two substantially radial walls, a curved wall connecting said radial walls and parallel walls connected therewith, a vane, pivot means for said vane pivoted to said parallel walls in proximity to one of said radial walls and in spaced relation with the other radial wall, a neck connected to said first named radial wall of the case and disposed between the pivot means and the other radial wall, and a damper in said pipe and operated by said vane.

13. A draft regulator for application to a pipe, said regulator comprising a case, a rectangular neck issuing outwardly from said case and in

communication therewith, said neck having transverse walls of a width substantially equal to the diameter of the pipe and side walls connected thereto, said transverse walls being constructed with arcuate edges adapted to fit against the pipe, extensions on said side walls adapted to be bent about the pipe, means for drawing said extensions together to hold the regulator attached to the pipe, a damper pivoted to the side walls of said neck and adapted to extend into the pipe when the regulator is applied thereto, a vane pivoted within said case and subject through said neck to the pressure within the pipe, and motion transmitting means connected to said damper and vane and moving said damper upon variation in pressure within the pipe.

14. A draft regulator for application to a pipe, said regulator comprising a case, a rectangular neck issuing outwardly from said case and in communication therewith, said neck having transverse walls of a width substantially equal to the diameter of the pipe and side walls connected thereto, said transverse walls being constructed with arcuate edges adapted to fit against the pipe, means connected to said side walls for attaching the regulator to the pipe, said side walls having aligning bearings therein positioned in proximity to one of said other walls, a damper having a shaft journaled in said bearings, a vane pivoted within said case, and subjected to the pressure within the pipe, and motion transmitting means connected to said damper and vane and moving said damper upon variations of pressure in the pipe.

15. In combination with a cylindrical pipe having a passageway therethrough, a case on said pipe having a chamber communicating with said passageway, said case being constructed with two parallel walls spaced apart a distance equal to the diameter of the pipe, said walls being tangent to said pipe, a pivoted damper disposed between said walls and having its axis disposed transversely of said walls and substantially diametrically of said pipe, said damper being supported by said walls, a pivoted vane disposed within said case and having its axis disposed transversely of said walls, and in spaced substantially parallel relation with respect to the axis of said damper, said vane being supported by the same walls of said case and means for connecting said vane to said damper so that said damper is operated by said vane.

16. In combination with a cylindrical pipe having a passageway therethrough, a case on said pipe having a chamber communicating with said passageway, said case being constructed with two spaced walls parallel to the axes of the pipe and issuing from the pipe along elements thereof, a pivoted damper disposed between said walls and having its axis disposed transversely of said walls and substantially diametrically of said pipe, said damper being supported by said walls, a pivoted vane disposed within said case and having its axis disposed transversely of said walls, and in spaced substantially parallel relation with respect to the axis of said damper, said vane being supported by the same walls of said case and means for connecting said vane to said damper so that said damper is operated by said vane.