

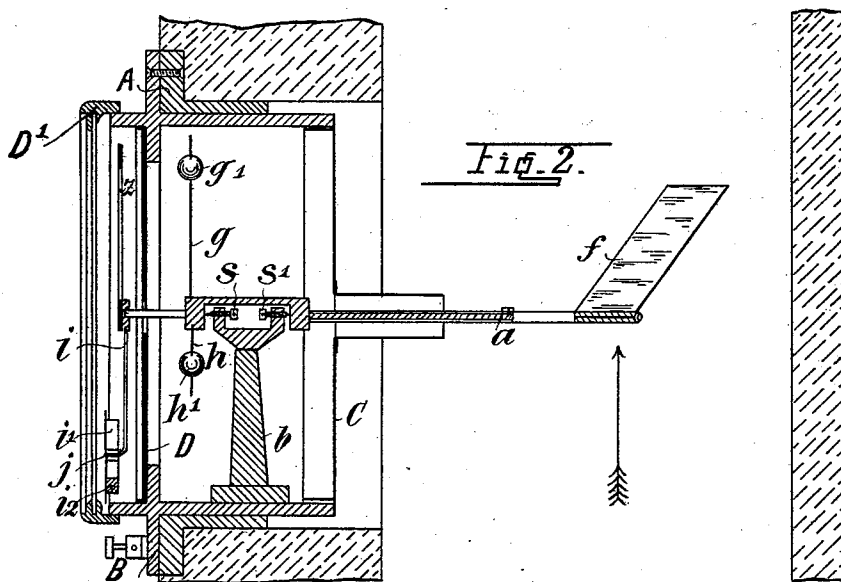
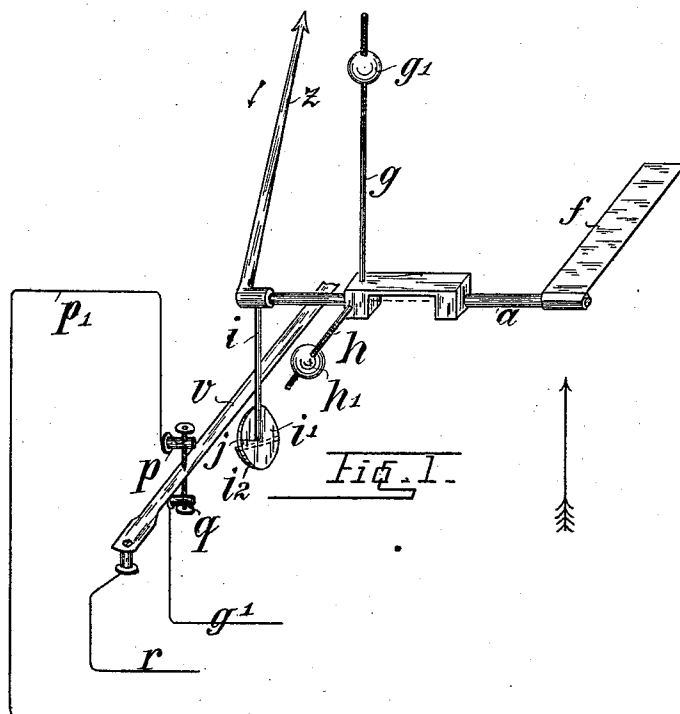
(No Model.)

2 Sheets—Sheet 1.

H. RECKNAGEL.
AIR DRAFT CONTROL APPARATUS.

No. 529,191.

Patented Nov. 13, 1894.



Witnesses
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(No Model.)

2 Sheets—Sheet 2.

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Fig. 3.

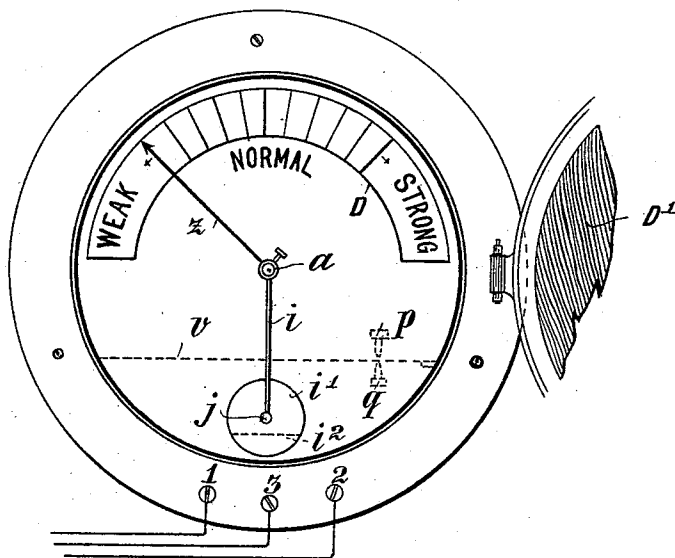
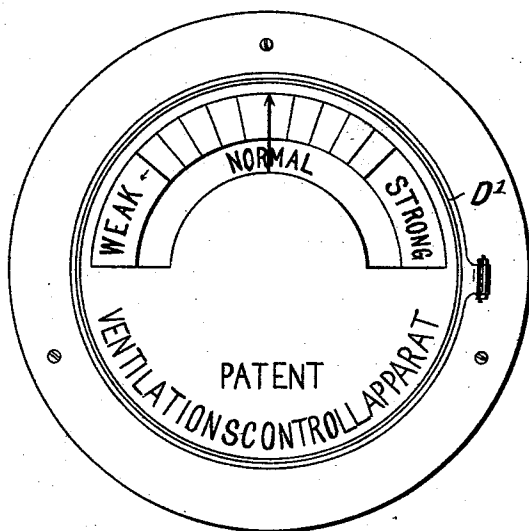


Fig. 4.



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UNITED STATES PATENT OFFICE.

HERMANN RECKNAGEL, OF WINTERTHUR, SWITZERLAND.

AIR-DRAFT-CONTROL APPARATUS.

SPECIFICATION forming part of Letters Patent No. 529,191, dated November 13, 1894.

Application filed February 6, 1894. Serial No. 499,295. (No model.) Patented in Germany February 1, 1893, No. 71,575.

To all whom it may concern:

Be it known that I, HERMANN RECKNAGEL, a citizen of Switzerland, residing at Winterthur, in the Swiss Republic, have invented a certain new and useful Improved Air-Draft-Control Apparatus, (for which I have obtained a patent in Germany No. 71,575, dated February 1, 1893,) of which the following is a full, clear, and exact description.

The present invention consists of an apparatus for controlling the air draft, for use in connection with ventilating systems to indicate any variation in the draft and in case the latter should exceed or drop below a certain desired standard, to report such irregularity to any desired part of the building.

The apparatus is constructed on the principle of that class of anemometers having a sensitive blade or plate which is actuated by the draft and the invention consists mainly in the means employed to regulate or adjust the blade to indicate any required draft and variations in such desired "standard" draft and also in certain means, hereinafter more particularly described, to increase the moment of inertia of the spindle and hand actuated by the said blade or plate, and thus obtain a steadier motion of the parts, which would otherwise move too suddenly into one or other of the extreme positions, thus continually reporting a merely momentary variation of the draft and giving rise to unnecessary inconvenience. In order to enable an apparatus of this kind to report variations in the draft to different parts of the building a steady motion of the parts is absolutely necessary; and it is owing to the want of this steadiness, that the ordinary anemometers are inapplicable for the purpose, since their light weight and momentary sensitiveness cause a continual making and breaking of the circuit and unnecessary alarm.

The present apparatus, which is particularly applicable for schools, hospitals, and in fact for all buildings having ventilating systems, has the great advantage, that on a change in the speed of the air current taking place the blade and pointer or hand perform the corresponding movement almost without further oscillation, so that the hand is always steady on the dial and the condition of the air draft can be read off at any time.

In order to make the present specification more easily intelligible reference is had to the accompanying drawings, in which similar letters and figures denote similar parts throughout the several views.

Figure 1 is a perspective diagrammatic view showing the general arrangement of the parts of the apparatus; Fig. 2, a vertical section through the apparatus; Fig. 3, a front elevation with the cover open and broken away, and Fig. 4 a complete front elevation.

The spindle a , which carries all the movable parts of the apparatus, is mounted on the points of the screws s s' at the top of the standard b fixed in the casing B of the apparatus, as shown at Fig. 2. To the front end of this spindle a are attached the pointer or hand i and the adjusting and balancing mechanism, hereinafter more particularly described, while the opposite end extends out of the casing into the air channel and carries the blade or plate f , which is advantageously made of aluminium and must be perfectly rigid. The apparatus should be fixed in a wall of the air channel in such manner as to be easily removable. For instance a ring A may be bricked in the said wall and the apparatus fitted into the ring and held in place by means of screws or in any other suitable manner (Fig. 2). The casing B is closed at the back by a plate C having a sleeve through which the spindle a passes, said plate serving to keep out dust and dirt. The front of the casing is closed by the dial D and the hinged glass front D' after the manner of a clock. The dial may be suitably graduated and is advantageously marked "Weak," "Normal" and "Strong."

The adjusting and balancing mechanism, which serves at the same time to increase the moment of inertia of the movable parts of the apparatus, consists of the adjustable weights g' , h' , and i' mounted respectively on the arms g , h , and i of the spindle a . Of these three weights, the weight h' serves to counterbalance the weight of the plate f and is mounted diametrically opposite to the same. Both weights g' and h' are adjustable on their respective rods which are threaded for the purpose. The weight i' is revoluble on the arm j of the rod i and eccentrically weighted at i^2 . Thus the same may be adjusted by turning it on its pivot j and removing its center of

gravity nearer to or farther from the center of the spindle a . The weight i' should fit its pivot j sufficiently tight as to enable it to remain in any position into which it is turned, or a suitably arranged spring may be employed to increase the friction. In order to adjust the apparatus in the first place, the eccentric weight i^2 should be turned into position nearest to the center of the spindle a and the weight g' adjusted to counterbalance it, so that the whole mechanism is balanced and will remain in any position stationary. By turning the disk i' with the eccentric weight i^2 on its pivot j , the equilibrium will be destroyed and the weight i^2 tends to swing the plate f in the opposite direction to the current of air which is to be controlled, coming in the direction indicated by the arrow in Fig. 1.

The pointer or hand z is mounted on the spindle at an angle of forty-five degrees to the plate f and the weight i^2 should be adjusted to allow the hand z to show "Normal" on the dial, when the required strength of current is playing on the plate f . From this it will be clear that by varying the position of the weight i^2 , the apparatus can be adjusted to any required strength of current, which will keep the pointer at "Normal."

In order to adjust the apparatus to a certain known current, an ordinary anemometer should be employed in combination with the same and the weight i^2 adjusted until the pointer z shows "Normal" when the current of air indicated by the anemometer is playing on the plate f . Any variation in the said current will then be indicated by the pointer which on a decrease of current will move toward "Weak" and on an increase toward "Strong" on the dial. This motion of the pointer z may be employed to make and break electric circuits in the following manner.

A very flexible flat spring v is arranged a little distance above the weight i' as shown at Figs. 1 and 3. To one end of this spring is attached a circuit wire r while at a suitable distance from the point of attachment of the spring two contacts p and q are arranged respectively a little above and below the spring.

The lower contact q normally—i. e., when the spring is not raised by the weight i' —touches the spring v completing the circuit $r q'$ while the upper contact p is situated slightly above the said spring. When now the pointer shows a "Normal" current the spring v will be lifted from the contact q by the disk i' (Fig. 3) but if the draft exceeds the normal strength, the said spring will be raised still higher and lifted by the weight or disk i' and make contact with p . On the other hand, if the draft drops below the normal, the said spring will be released by the disk i' and fall down onto the contact q completing the circuit $q' r$. The circuit may lead to the superintendent's room or to other convenient

part of the building so that any irregularity will be reported at such point. The contacts p and q are connected to the contact screws 1 and 2 Fig. 3, while 3 is in communication with the spring v .

The apparatus can be used in connection with any air passages whether vertical, horizontal, or at an angle, as it will only be necessary to arrange the angle of the plate f to correspond.

I claim as my invention—

1. An air draft control apparatus having a spindle a mounted on antifriction bearings, and having at one end a plate or blade f actuated by the air draft and at the opposite end a pointer z , suitable weights on said spindle to counterbalance the said plate and pointer and increase the moment of inertia of the movable part and an adjustable weight i^2 to adjust the apparatus to any required draft substantially as described.

2. An air draft control apparatus having a spindle a mounted on points $s s'$, a standard b to carry said spindle, a plate or blade f at one end of said spindle to extend into the air passage, a pointer z at the opposite end of said spindle, an arm h with adjustable weight h' to counterbalance the plate f , an arm i with weighted disk i' and adjustable weight i^2 , an arm g with adjustable weight g' and a suitable dial D in the manner and for the purpose substantially as described.

3. In the combination with an air draft control apparatus having a spindle a mounted on antifriction bearings and having at one end a plate f and at the other a pointer z , suitable weights on said spindle to counterbalance the said plate and pointer and increase the moment of inertia of the movable parts and an adjustable weight i^2 , a flexible spring v to extend horizontally over the adjustable weight i^2 and having a conductor r and contacts p and q above and below said spring in the manner and for the purpose substantially as described.

4. An air draft control apparatus having a spindle a mounted on points $s s'$, a standard b to carry said spindle, a plate or blade f at one end of said spindle to extend into the air passage, a pointer z at the opposite end of said spindle, an arm h with adjustable weight h' to counterbalance the plate or blade f , an arm i with weighted disk i' and adjustable weight i^2 , an arm g with adjustable weight g' and suitable dial D for the said pointer, a flat spring v mounted in the casing and extending horizontally over the disk i' , contacts p and q above and below said spring and suitable electric connection substantially as described and shown and for the purpose specified.

In witness whereof I have hereunto set my hand in presence of two witnesses.

HERMANN RECKNAGEL.

Witnesses:

HERM. GUTKNECHT,
T. BAEBLER.