

C. M. BERNEGAU.
ANEMOMETER.
APPLICATION FILED OCT. 10, 1905.

943,962.

Patented Dec. 21, 1909.
2 SHEETS—SHEET 1.

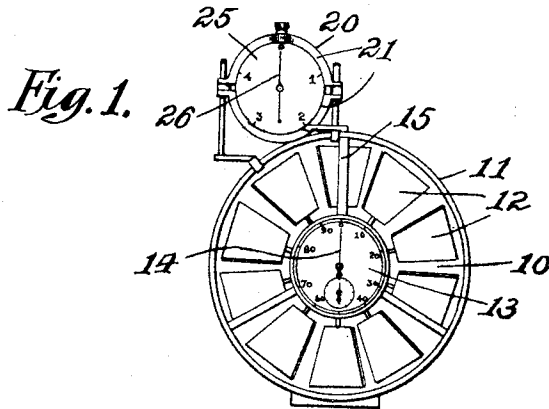
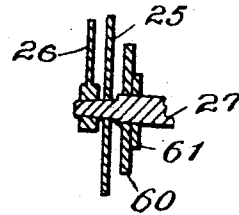
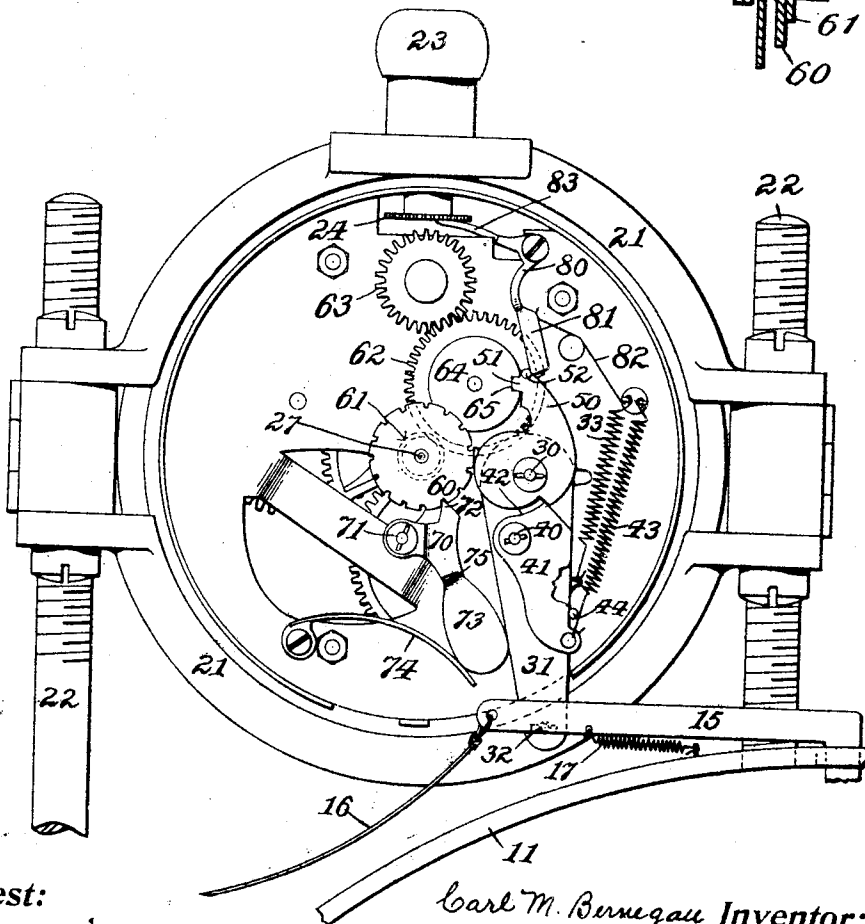


Fig. 2.



Attest:
Herman Meyer
Alan Mc Donnell.

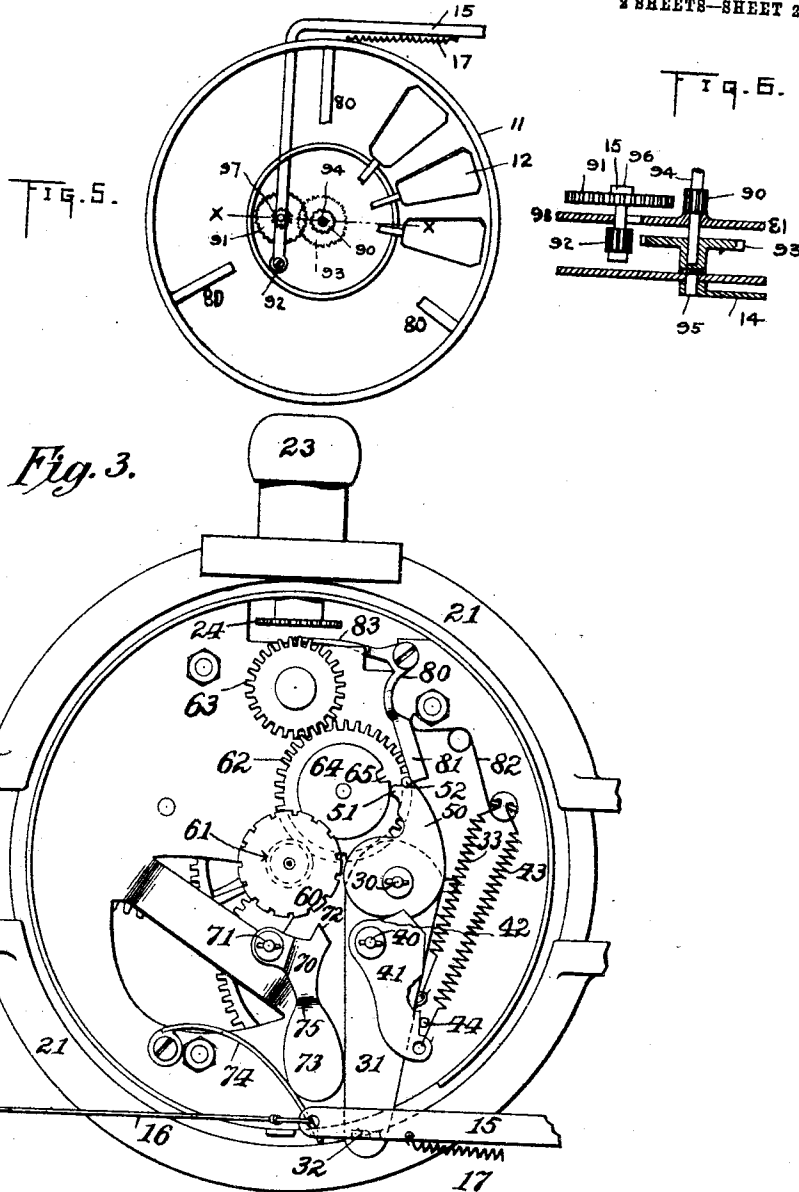
Carl M. Bernegau, Inventor:
by William R. Baird
his Atty.

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UNITED STATES PATENT OFFICE.

CARL M. BERNEGAU, OF HOBOKEN, NEW JERSEY.

ANEMOMETER.

943,962.

Specification of Letters Patent.

Patented Dec. 21, 1909.

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To all whom it may concern:

Be it known that I, CARL M. BERNEGAU, a citizen of the United States, residing at Hoboken, in the county of Hudson and State of New Jersey, have invented certain new and useful Improvements in Anemometers, of which the following is a specification.

My invention relates to anemometers and its novelty consists in the means employed in connection with the registering mechanism of such an instrument to automatically disconnect the same from its driving mechanism after the lapse of a predetermined time whereby the amount of air or other gas flowing through the instrument during such time may be accurately measured.

At present, when it is desired to use an anemometer to ascertain the amount of air passing through a flue or similar structure, it is customary to start the register of the instrument after the current has "set" or become relatively steady by pulling the control lever. Simultaneously the operator examines his watch. Then after a time ascertained from the watch has elapsed the operator again actuates the control lever to stop the register and reads off from the register an indication of how much air has passed through the instrument during the time which has elapsed. This method is liable to several sources of error. In the first place owing to the personal equation of the operator the manipulation of the control lever is not accurately timed with the time of (connecting and disconnecting) the watch and in the second place these instruments frequently being placed in situations difficult of access and hard to manipulate and control, an appreciable time must elapse after they have been started or stopped before the watch can be examined or the time indicated can be called out by another operator and heard by the person controlling the anemometer.

The purpose of my invention is to provide means whereby these errors may be wholly or in great part eliminated. I accomplish this purpose by placing a time keeping mechanism, as a watch, on or near the instrument arranged so that it may be connected with the registering mechanism of the anemometer, simultaneously with the connection of the anemometer with the registering mechanism, so that when the control lever is moved to start the anemometer, the watch mechanism is connected with the

registering mechanism and after the watch mechanism has run a predetermined time, it automatically, through the action of intermediate mechanism, reverses the control lever of the register and disconnects the watch mechanism from the register and the register from the anemometer. The instrument can then, if desired, be moved to a more convenient place for examination, the pointers or hands of the watch and of the anemometer register each remaining fixed until again actuated.

In the drawings Figure 1 is a front elevation in miniature of a usual form of anemometer showing the adjacent watch mechanism, Fig. 2 is an enlarged view with the intermediate mechanism placed on the watch as such mechanism is seen when the dial plate of the watch has been removed and the parts are at rest, Fig. 3 is a view of the same mechanism as that shown in Fig. 2 when the parts are released. Fig. 4 is a detail view. Fig. 5 is a rear view of an anemometer with parts broken away and other parts omitted in order to show how the registering mechanism is connected with the control lever. Fig. 6, a detail sectional view taken on the line $x-x$ of Fig. 5.

In the drawings, 10 is an anemometer of any approved form, 11 being its frame, 12, 12 its vanes, and 13 its register, of which 14 is the hand or pointer, and 15 the control lever. The vanes are secured on an arbor 94 journaled in arms 80 and plate 81, the arbor carrying a pinion 90 and having loosely mounted thereon a gear wheel 93. An arbor 96 is carried by the control lever 15 and has a gear 91 in the same plane as the pinion 90, and a pinion 92 in the same plane as the gear 93. The gear 93 is rigidly attached to the stem 95 of the hand 14. The control lever 15 is pivoted at 92 and by a spring 17 is normally drawn to the right as shown in Figs. 1 and 3 and to the left as shown in Fig. 5.

20 (Fig. 1) is the watch or time keeping mechanism. It is secured to the anemometer frame 11 by means of a framework comprising semicircular yokes 21, 21, embracing the watch casing, and suitable means as the threaded supports 22, 22, which are attached to the anemometer frame whereby the parts are securely held in position. The watch mechanism forms no part of my invention and any convenient means may be employed to locate it in the vicinity of the anemometer.

The watch is provided with a stem wind-

ing mechanism, the stem 23 being provided with a gear 24, which may be thrown into engagement with the winding mechanism or setting mechanism of the watch in the usual manner. It is also provided with a dial 25 (Figs. 1 and 4) graduated in any suitable manner, in this instance being provided at the usual XII point of a clock dial with a zero and the whole circle being divided into five spaces marked 1, 2, 3, 4 and 0, and a hand 26 which travels entirely around the dial in five minutes and which is rotated by an arbor 27 of usual form. All of the parts of the watch above mentioned are of common construction and when the stem 23 is pressed inward, in a manner well known in this art, the gear 24 engages the gear 63 which in turn meshes with gear 62, the latter meshing with pinion 61 on hand arbor 27, whereby the hand 26 may be turned by turning the stem.

Mounted upon any convenient part of the framework of the watch and pivoted at 30 is a lever 31 provided with a connection 32 whereby, as the control lever 15 of the anemometer is moved, the lever 31 moves with it. The connection may be of any convenient construction. It is shown in dotted outline in Figs. 2 and 3 as a pin on the lever 15 and a hole in the lever 31 to receive the pin. A coiled spring 33 serves to put a constant tension upon the lever 31 and to retract it to position when it becomes possible to do so. Pivoted upon the lever 31 at 40 is a second lever 41 having a cam surface 42, the purpose of which will presently appear. It is provided with a coiled tension spring 43, the other end of which is secured to a fixed part of the watch frame, a stop pin 44 serving to limit its movement toward the right. Also pivoted upon the lever 31 at 30 is a dog 50 having a single tooth 51 having sloping sides. At its outer extremity it is provided with an upwardly projecting pin 52.

Frictionally mounted upon the arbor 27 (Fig. 4) of the watch hand is a notched disk 60 and underneath the disk and rigidly secured thereto or made integral therewith is a pinion 61 (shown in full lines in Fig. 4 and in dotted lines in Figs. 2 and 3) adapted to mesh with a spur gear 62 which in turn engages with the idler gear 63 forming part of the usual setting mechanism of the watch. On the upper or outer surface of the gear 62 is a disk 64 provided with a notch 65 with inwardly sloping edges adapted to receive the single tooth 51 of the dog 50. As the hand 26 is timed to make a complete revolution in five minutes and the disk 60 has fifteen notches, the distance between any two notches equals one third of a minute or twenty seconds.

70 is a stop pawl pivoted at 71 to any suitable part of the frame of the watch and provided with a pointed tooth 72 adapted to engage the notches of the disk 60. It

also has a tail piece 73 against which normally presses a flat spring 74 mounted on the framework. This tail piece is bent downward or backward at 75 to place it in the same plane as that of the lever 31 so that the movement of the lever will be communicated to the pawl.

80 is a bell crank lever pivoted at any suitable point on the frame of the watch and one end of which 81 is normally held against the pin or projection 52 on the dog 50 by means of a hair spring 82. The other end 83 of the lever is designed to project in front of the cog wheel 24 and to be brought into contact therewith when the stem 23 is moved inward.

The mode of using the device is as follows: Supposing the anemometer to have been placed in a flue or similar place and the vanes to be rotating under the action of the passing air current, and that it is desired to test its operation for the space of five minutes, the watch is set to bring the hand 26 to zero, or "5" as the zero point coincides with the "5" point. The operator then pulls the cord 16. This moves the control lever 15 on its pivot 97 and throws the pinion 92 into mesh with gear 93 and gear 91 into mesh with pinion 90 causing the rotation of arbor 94, and the vanes, to be communicated through pinion 90, gear 91, pinion 92, and gear 93 to the stem 95 and registering hand 14, thus starting the registering mechanism of the anemometer. The motion of the control lever 15 will, however, through the connection 32, move the lever 31 from the position shown in Fig. 2 to that shown in Fig. 3. The nose of the lever 41 has been moved by the motion of the lever 31 against the adjacent surface of the dog 50, because, as the lever 31 moves, the pivot 40 of the lever 41 being rigidly secured to the lever 31 moves with it. The dog, however, as it moves, disengages the tooth 51 from the notch 65 of the disk 64 because the sloping surfaces of the tooth and notch are arranged to permit such disengagement, and the wheel 64 is thus put in condition to be rotated. At the same time that the lever 31 has been forced to the left by the pull upon the cord 16, it is pressed against the tail piece 73 of the stop pawl 70 and moves the tooth 72 of that pawl out of engagement with a notch on the disk 60, so that the disk 60 and its pinion 61 are free to turn with the arbor 27.

The hand 26 of the watch is mounted on the arbor 27 and moves with it, and as the pinion 61 and disk 60 are frictionally connected with the arbor 27, the moment that the stop pawl 70 is moved away from the notched disk 60, then the pinion 61 and notched disk 60 and hand 26 all begin to move, which motion is communicated to the gear 62 and idler 63.

The tooth 51 of the dog 50, after it has been disengaged from the notch 65, is still in contact with the outer periphery or edge of the disk 64. The two springs 33 and 43 provide a yielding pressure tending to keep such contact constant and this tooth against the outer periphery of this disk until its rotation brings the notch 65 around again to make an engagement with this tooth. When this engagement of the tooth 51 and the notch 65 again takes place, the mechanism stops automatically, because, as soon as the dog 50 is permitted to move inwardly under the action of the two springs above referred to, the spring 33 retracts the lever 31 (this movement being assisted by the tension of the spring 17) back to its original position, the spring 74 at the same time pressing against the tail piece 73 of the stop pawl and causing the tooth 72 of the latter to engage with one of the notches of the disk 60, the latter stops and the hand 26, of course, stops with it. The control lever 15 has also by the pull of the spring 17 been reversed and the registering mechanism of the anemometer stopped.

It will be understood that the arbor 27 is in motion all the time, but that the disk 60 does not move until permitted to do so by the disengagement of the stop pawl 70, and it will be further understood that the design of the mechanism is always to stop the register of the anemometer when the hand is at zero in the timing mechanism.

It will be observed that in the operation just described, the disk 64 has made one entire revolution from the time that the tooth 51 has been disengaged from the notch 65 until the engagement takes place again. In the form of apparatus shown this complete rotation of the disk 64 coincides with a period of five minutes as indicated on the dial in Fig. 1. I have provided means whereby this period and consequently the time of actuation or rotation of the anemometer may be varied. In other words, means so that the hand 26 can be set to start at any point on the dial. In order to do this I make use of the stem 23 of the watch pendant. This being pressed inwardly moves the cog wheel 24 until it is in engagement with the idler 63 and through such idler with the spur gear 62 and pinion 61. But this spur gear would normally be locked against rotation, because the tooth 51 of the dog 50 is in the notch 65. It is therefore necessary to disengage the tooth 51 from the notch 65. I accomplish this by means of a bell crank lever 80, the end 83 of which, being in the inward path of the cog wheel 24, has been swung so that its other end 81 has been swung back or away from the pin 52.

The actuation of the stem 23 and cog 24 will readily disengage the tooth 51 from the notch 65 because of their sloping surfaces

and allow the disk 64 to be rotated to any position which will bring the hand or pointer 26 also to any position to indicate any required time. For example, if the parts be so rotated that the hand or pointer is at 2 instead of at zero and the string 16 is then pulled, it is obvious that as the mechanism will automatically stop when the tooth 51 has engaged with the notch 65, that the period of time which will have elapsed is two minutes instead of five.

What I claim as new is:—

1. An anemometer comprising movable vanes and a registering mechanism, said vanes and registering mechanism being normally disconnected, in combination with a timing mechanism, means for holding an element thereof from movement, and means for simultaneously connecting the vanes with the registering mechanism and releasing said holding means.

2. An anemometer comprising movable vanes and a registering mechanism, said vanes and registering mechanism being normally disconnected, in combination with a timing mechanism, means for holding an element thereof from movement, means for simultaneously connecting the vanes with the registering mechanism and releasing said holding means.

3. In an anemometer, the combination of a driving shaft, a registering mechanism, connecting means between said shaft and mechanism, a lever for controlling said connecting means, a timing mechanism comprising a driving shaft and indicating means, and connecting means between the said last mentioned driving shaft and said indicating means, also controlled by the aforesaid lever.

4. In an anemometer, the combination of a driving shaft, a registering mechanism, connecting means between said shaft and mechanism, a lever for controlling said connecting means, a timing mechanism comprising a driving shaft and indicating means, connecting means between the said last mentioned driving shaft and said indicating means, also controlled by the aforesaid lever, whereby the registering mechanism is simultaneously connected with and disconnected from the anemometer after the lapse of a predetermined time, and means for varying the extent of such running time.

5. In a mechanism of the character described, the combination with a gear carrying a disk provided with a single notch on its periphery, of a dog provided with a tooth adapted to engage with said notch, a lever adapted to carry the dog, a second lever pivoted on the first lever and provided with means comprising a spring, whereby it is normally pressed against the dog, and a stop for limiting the movement of the second lever induced by the spring.

6. In a mechanism of the character de-

scribed, the hand arbor of a watch, a pinion
frictionally mounted thereon, a notched disk
connected therewith and carried thereby, a
stop pawl adapted to engage with the
5 notches in the disk, a spring normally press-
ing the pawl into such engagement, a gear
carrying a disk provided with a single notch
in its periphery, a dog provided with a tooth
adapted to engage with said notch, a lever
10 adapted to carry the dog and to move against

the stop pawl, an anemometer register hav-
ing a control rod, and a connection between
the lever and said control rod.

In testimony whereof I affix my signature
in presence of two witnesses.

CARL M. BERNEGAU.

Witnesses:

HERMAN MEYER,
ALAN McDONNELL.