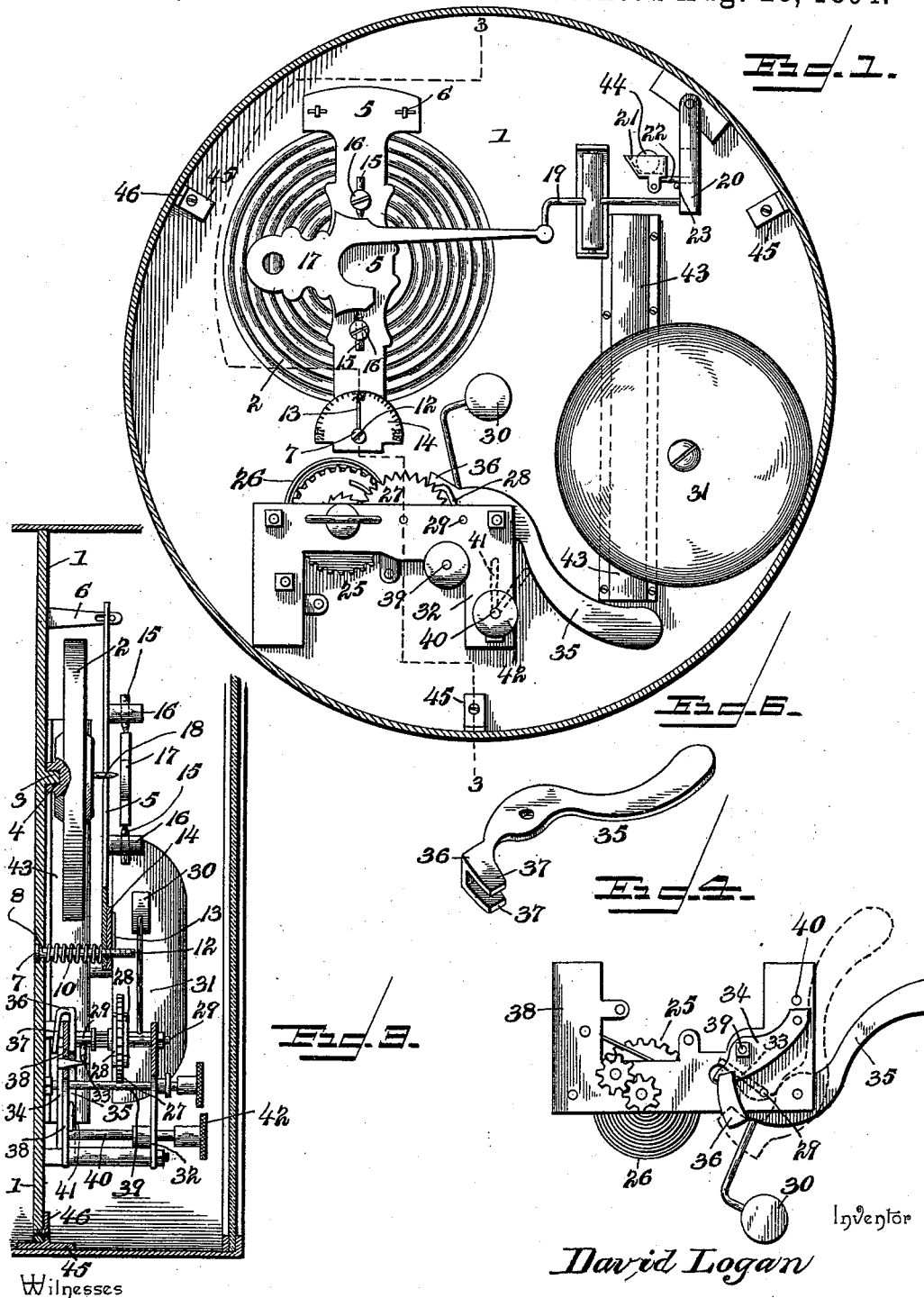


2 Sheets—Sheet 1.

No. 525,273.

Patented Aug. 28, 1894.



E. H. Stewart,  
D. D. & Co.

By *his* Attorneys.

Chas Snow

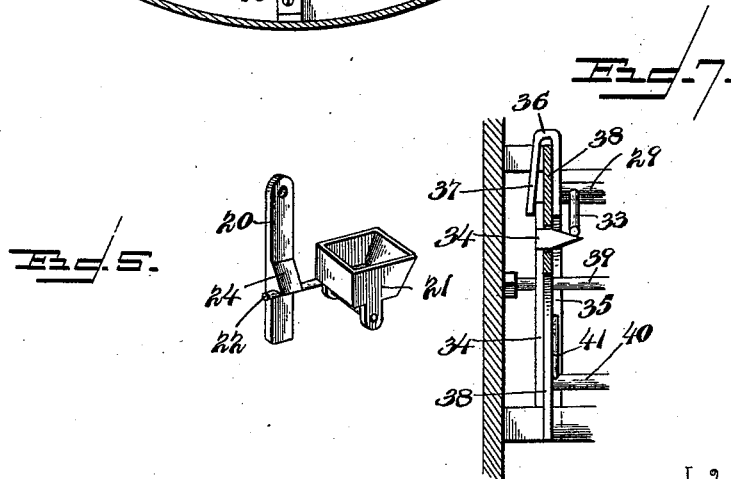
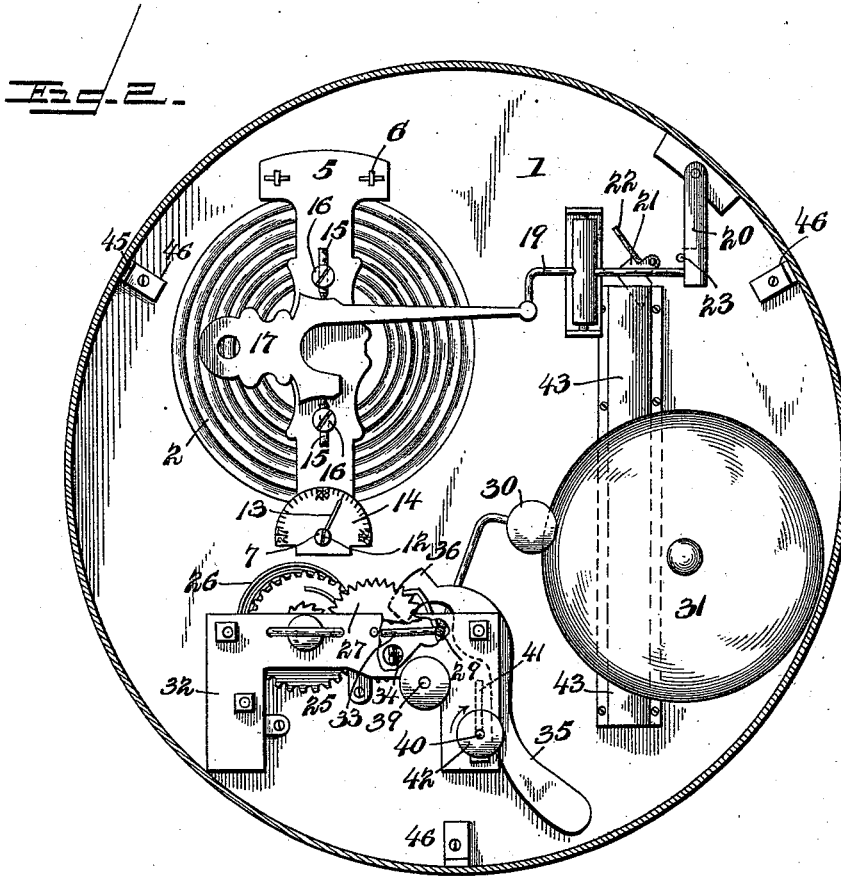
(No Model.)

2 Sheets—Sheet 2.

D. LOGAN.  
ANEROID BAROMETER.

No. 525,273.

Patented Aug. 28, 1894.



Inventor

David Logan

Witnesses  
C. H. Stewart  
*[Signature]*

By his Attorneys.

*C. H. Snow & Co.*

# UNITED STATES PATENT OFFICE.

DAVID LOGAN, OF MEADVILLE, PENNSYLVANIA, ASSIGNOR OF ONE-HALF  
TO THOS. H. DELAMATER, OF SAME PLACE.

## ANEROID BAROMETER.

**SPECIFICATION** forming part of Letters Patent No. 525,273, dated August 28, 1894.

Application filed January 19, 1894. Serial No. 497,439. (No model.)

### *To all whom it may concern:*

Be it known that I, DAVID LOGAN, a citizen of the United States, residing at Meadville, in the county of Crawford and State of Pennsylvania, have invented a new and useful Aneroid Barometer, of which the following is a specification.

My invention relates to an aneroid barometer, and has for its object to provide a device for use in connection with the vacuum chamber of a barometer which will indicate audibly the approach of a storm by tripping an alarm mechanism when the atmosphere assumes a certain rarefied condition, the exact degree of rarefaction necessary to sound the alarm being controlled by certain means of adjustment which may be manipulated by the operator or observer.

It is known that the atmosphere becomes rarefied to a greater or less extent just preceding a storm and that the barometer falls approximately to a point between twenty-seven and twenty-nine inches, and it is important under certain circumstances to know the precise moment at which such fall occurs and hence the utility of my invention, which consists in certain novel constructions, combination, and arrangement of parts hereinafter described in connection with the drawings and particularly pointed out in the claims.

In the drawings:—Figure 1 is a view of a barometer constructed in accordance with my invention, with the parts set. Fig. 2 is a front view partly broken away to show the trip-lever and the means for locking the alarm mechanism thereby, after the alarm is sprung. Fig. 3 is a vertical section taken through the vacuum chamber and the alarm mechanism on the line 3—3 of Fig. 1. Fig. 4 is a detail view in elevation of the trip lever and means for locking the alarm, viewing the same from the reverse side. Fig. 5 is a detail view in perspective of the tilting-basket for the gravity ball, and means for securing the same temporarily in its receiving position. Fig. 6 is a detail view of the trip lever. Fig. 7 is a detail section through the alarm mechanism on the line indicated by 3—3 of Fig. 1.

Like numerals of reference indicate like parts in all the figures of the drawings.

1 designates the base of the improved de-

vice, to which is secured the vacuum chamber 2 of substantially the ordinary construction, the means for securing said vacuum chamber to the base consisting of a threaded stud 3 projecting forward from the base and fitting in a threaded socket 4 on the rear side of the vacuum chamber.

5 represents a supporting-plate, which extends diametrically across and out of contact with the face of the vacuum chamber, is pivotally connected at one end to the standards or posts 6, and is threaded at the other end upon a rotatable pin 7, which is fitted at its rear end in a suitable socket 8 in the base.

Coiled upon the pin 7 between the base and the inner or rear side of the supporting-plate is a spring 10, which by bearing forcibly against said plate prevents vibration thereof. The pin 7 is provided at its upper end with a kerf or slot 12 adapted for the reception of the edge of a tool, whereby the pin may be turned, and fixed to the pin above the plane of the plate is a pointer 13, which traverses a dial 14 inscribed to indicate the inches and parts thereof, such as 27, 28 and 29, as shown in the drawings.

Mounted between pivot-screws 15, which are carried by the standards 16 on the supporting-plate, is a lever 17, one end of which is arranged in the path of a needle 18 carried by and fixed securely to the corrugated or outer faces of the vacuum chamber near its center. The long arm of this main lever 17 is arranged in operative relation with one arm of the rocking-lever 19, and the other arm of said rocking-lever is engaged with the free end of a spring-latch 20 in such manner that when the short arm of the main lever is moved outward or from the vacuum chamber by the expansion of such chamber the free end of the latch is moved from the base. Fulcrumed upon the base at a point adjacent to the latch above described is a basket 21 provided with a retaining-arm 22 which is adapted when the basket is in its normal or receiving position to rest upon a stop-pin 23 and engage a shoulder 24, Fig. 5, which is formed upon the latch. This basket is so constructed as to tilt or turn over automatically when released from the shoulder of the latch.

25 represents an alarm mechanism consisting essentially of a spiral actuating spring 26, an escapement wheel 27, an escapement lever 28 carried by an arbor 29, a knocker 30, 5 and a bell or gong 31, the connection between said spring and escapement-wheel consisting of a train of gears such as is employed in an ordinary clock alarm mechanism, all being mounted in a suitable framework 32. The 10 arbor 29 is provided with a lateral arm 33, and arranged in operative relation with this arm is a spring-catch 34, normally held depressed and out of the path of said arm but adapted to be elevated to occupy a position 15 in the path of the arm and thus prevent vibration of the arbor.

35 represents the trip-lever, which is provided with a bifurcated head 36, forming the parallel jaws 37 which are adapted to operate 20 upon opposite sides of the rear plate 38 of the frame supporting the alarm mechanism, and 39 represents a pull-rod which is arranged in said frame and is connected at its rear end to the spring-catch.

40 represents a setting spindle, which is rotatably mounted in the frame, is provided with a lateral arm 41, and terminates at its 25 outer end in a milled head 42, the length of said arm 41 being such that when the setting spindle is turned it will strike the inner side of the trip-lever and push the long arm thereof 30 outward to a position shown in Fig. 1.

43 represents a tube or chute which extends from a point just below the tilting-basket to 35 a point adjacent to and above the free end of the trip-lever when the latter is in said position shown in Fig. 1; and 44 represents a ball or weight, which is adapted when the alarm is set to be placed in the basket.

40 This being the construction of my invention, the operation thereof is as follows:—The rotatable pin which supports one end of the supporting-plate 5 is turned to cause the pointer to indicate the degree upon the dial 45 showing the height at which it is desired that the alarm shall be sounded making allowance for the altitude of the observation, such adjustment of the pointer by means of the rotatable pin causing a slight variation in the 50 distance between the face of the vacuum chamber and the plane of said plate, and hence a corresponding distance between the rear surface of the short arm of the main lever and the terminal of the needle carried by the vacuum chamber. The basket is arranged 55 in its upright or receiving position, as shown in Fig. 1, and the weight or ball is placed therein, the arm of said basket being engaged with the shoulder of the latch, as before described. Previous to the winding of the 60 alarm mechanism the pull-rod is drawn forward to extend the spring-catch into the path of the arm carried by the arbor of the escapement-lever; the free end of the trip-lever is 65 elevated to a position adjacent to and beneath the lower end of the guide tube or chute by turning the setting spindle in the direc-

tion indicated by the arrow in Fig. 2, and thus depressing the parallel jaws at the other 70 end of said trip-lever and causing the rear jaw to engage the free end of said spring-catch and hold the same in the position to which it is drawn by the pull-rod, as shown in the vertical section, Fig. 3. With the 75 parts in the positions thus described a variation in the atmospheric pressure sufficient to bring the point of the needle on the vacuum chamber in contact with the rear surface of the main lever will cause the deflection of the latch by which the ball or weight-sup- 80 porting basket is held upright and thus release such basket and cause it to drop the ball or weight into the guide-chute or tube. At the lower end of said tube or chute the ball or weight strikes the long arm of the 85 trip-lever, thereby disengaging the jaws of said lever from the catch, by which the arbor of the escapement-lever is retained, thus releasing the alarm.

It is my intention to arrange an ordinary 90 barometer or a barometer provided with the usual attachments consisting of a dial-pointer and scale indicating various degrees of pressure upon the reverse side of the base shown in the drawings, but as such arrangement forms 95 no part of my invention I have not illustrated the same.

It will be understood that in practice various changes in the form, proportion, and minor details of construction may be resorted to 100 without departing from the spirit or sacrificing any of the advantages of this invention.

The arrangement of the barometer alarm device, forming the subject-matter of my invention, upon one side of the base plate and 105 the ordinary barometer on the opposite side, necessitates a different mode of securing the base-plate in the shell or casing, and therefore I prefer to employ a clip 45 adapted to be soldered against the inner surface of the 110 shell transversely to the plane of the base-plate and provided at an intermediate point with a perpendicularly disposed ear 46, which is fastened by means of a screw or similar 115 device to the base-plate. In addition to forming a simple and efficient means for attaching the base-plate to the shell, this clip serves to strengthen said shell, and when desired it may be extended from the front to the rear 120 thereof. Preferably three of these clips are employed in each barometer.

Having described my invention, what I claim is—

1. The combination with a vacuum chamber affected by meteorological changes, of a 125 needle fixed to and carried by a sensitive wall thereof, an automatic alarm mechanism, a trip-device for normally locking the alarm mechanism, and means controlled by said needle for operating the trip-device to re- 130 lease the alarm mechanism, substantially as specified.

2. The combination with a vacuum chamber affected by meteorological changes, of a

needle fixed to and carried by a sensitive wall thereof, an automatic alarm mechanism, a trip-device for normally locking the alarm mechanism, means controlled by said needle  
5 for operating the trip-device to release the alarm mechanism, and means for adjusting the parts to vary the point of release of the alarm mechanism, substantially as specified.

3. The combination with a vacuum chamber, of a main lever having one of its arms arranged in the path of a needle carried by said chamber, an alarm mechanism, a trip-lever connected with said alarm mechanism, a tilting basket adapted to contain a ball or  
15 weight to actuate said trip-lever, a latch to secure said basket in its upright position, and connections between the main lever and said latch, substantially as specified.

4. The combination with a vacuum chamber, of a main lever having one of its arms arranged in the path of a needle carried by said chamber, a tilting basket adapted to contain a ball or weight, a spring-latch provided with a shoulder to engage an arm of said basket  
25 to maintain the latter in an upright position, a rocking-lever forming the connection between the main lever and said latch, and an alarm mechanism adapted to be actuated by a ball or weight when released from the basket, substantially as specified.  
30

5. The combination with a vacuum chamber, a main lever having one of its arms arranged in the path of a needle carried by the said chamber, a tilting basket adapted to contain a ball or weight, and means connected  
35 with said main lever to retain the basket in an upright position, of an alarm mechanism having an escapement lever provided with an arbor carrying a lateral arm, a catch adapted  
40 to occupy a position in the path of said arm and normally held out of said path, and a trip-lever adapted to engage said catch to maintain it in the path of said arm, and arranged when in said locking position in the  
45 path of a ball or weight discharged from the said basket, substantially as specified.

6. The combination with a vacuum chamber, a main lever connected to and adapted to be operated by said chamber, a basket

adapted to contain a ball or weight, a latch to  
50 secure said basket in its upright position, and connections between said lever and the latch, of an alarm mechanism having an escapement-lever provided with an arbor carrying a lateral arm, a spring-catch adapted to  
55 occupy a position in the path of said arm and normally held out of said path, a pull-rod connected to the catch, a trip-lever provided with jaws to engage and hold said catch in the path of the arm carried by the arbor, and a  
60 setting spindle arranged to throw the trip-lever into engagement with the catch, substantially as specified.

7. The combination with a vacuum chamber, of a lever having one of its arms arranged  
65 in the path of a needle carried by said chamber, trip-devices operatively connected to the said lever, an alarm mechanism controlled by said trip-devices, and means for adjusting the lever to vary the distance of its arm from  
70 said needle, substantially as specified.

8. The combination with a vacuum chamber, of a supporting-plate, means for adjusting said plate toward and from the plane of the vacuum-chamber, a lever fulcrumed upon  
75 said plate with one of its arms in the path of a needle carried by the vacuum chamber, trip-devices operatively connected to the said lever, and an alarm mechanism controlled by the trip-devices, substantially as specified.  
80

9. The combination with a vacuum chamber, of a supporting-plate extending there-  
over, of a rotatable pin threaded in an opening in one end of said plate and carrying a  
85 pointer to traverse a dial, a lever fulcrumed upon said supporting-plate with one of its arms arranged in the path of a needle carried by the vacuum chamber, trip-devices operatively connected to the lever, and an alarm mechanism controlled by the trip-  
90 vices, substantially as specified.

In testimony that I claim the foregoing as my own I have hereto affixed my signature in the presence of two witnesses.

DAVID LOGAN.

Witnesses:

JOHN H. SIGGERS,  
E. G. SIGGERS.