

CROSS REFERENCE

Dec. 23, 1930.

R. R. WEST

1,786,277

VAULT VENTILATOR

Original Filed Nov. 14, 1927

3 Sheets-Sheet 1

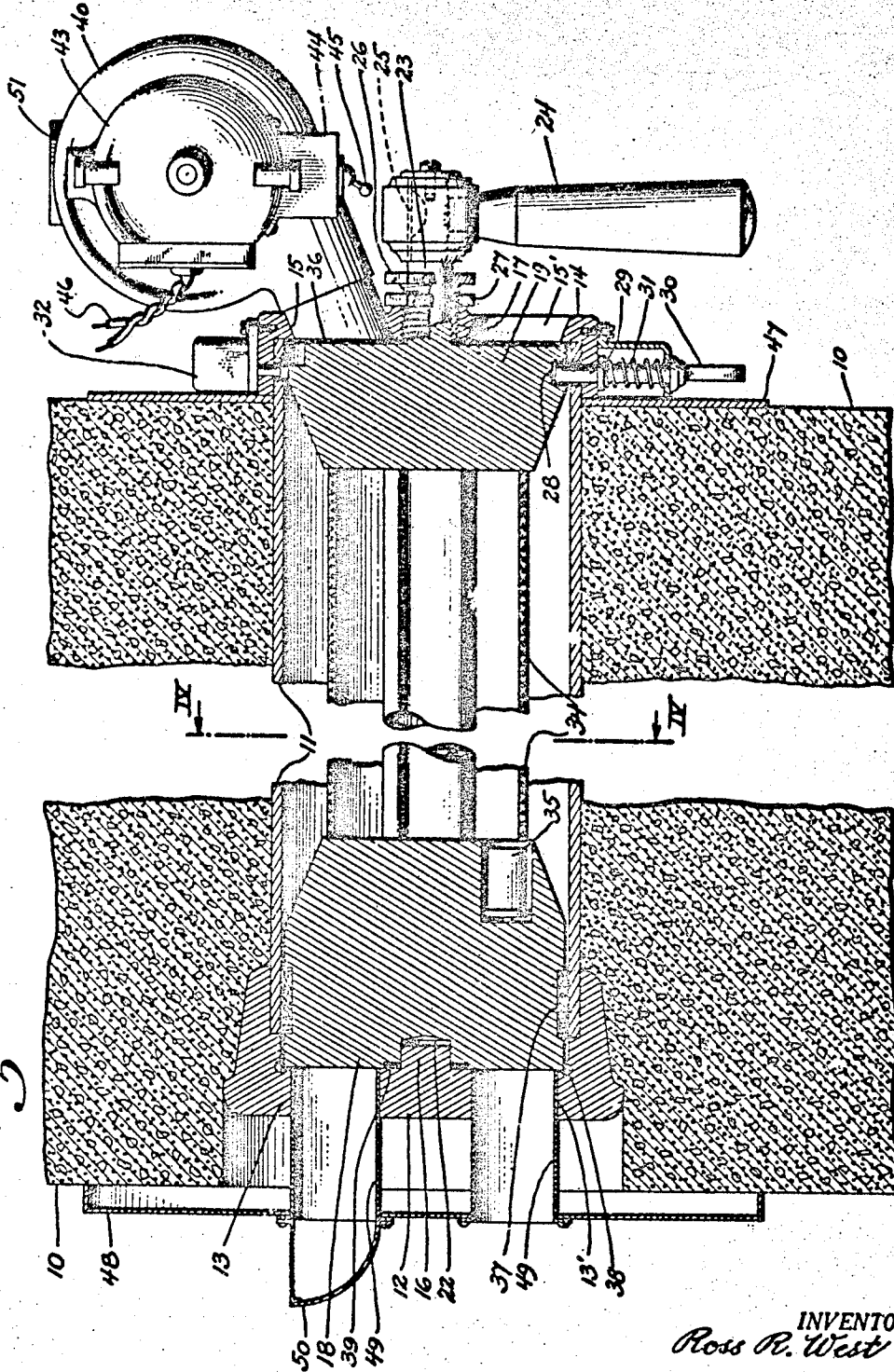


Fig. 1.

INVENTOR.
Ross R. West
 BY
Lounsbur, Loftis & Abelt
 ATTORNEYS.

Dec. 23, 1930.

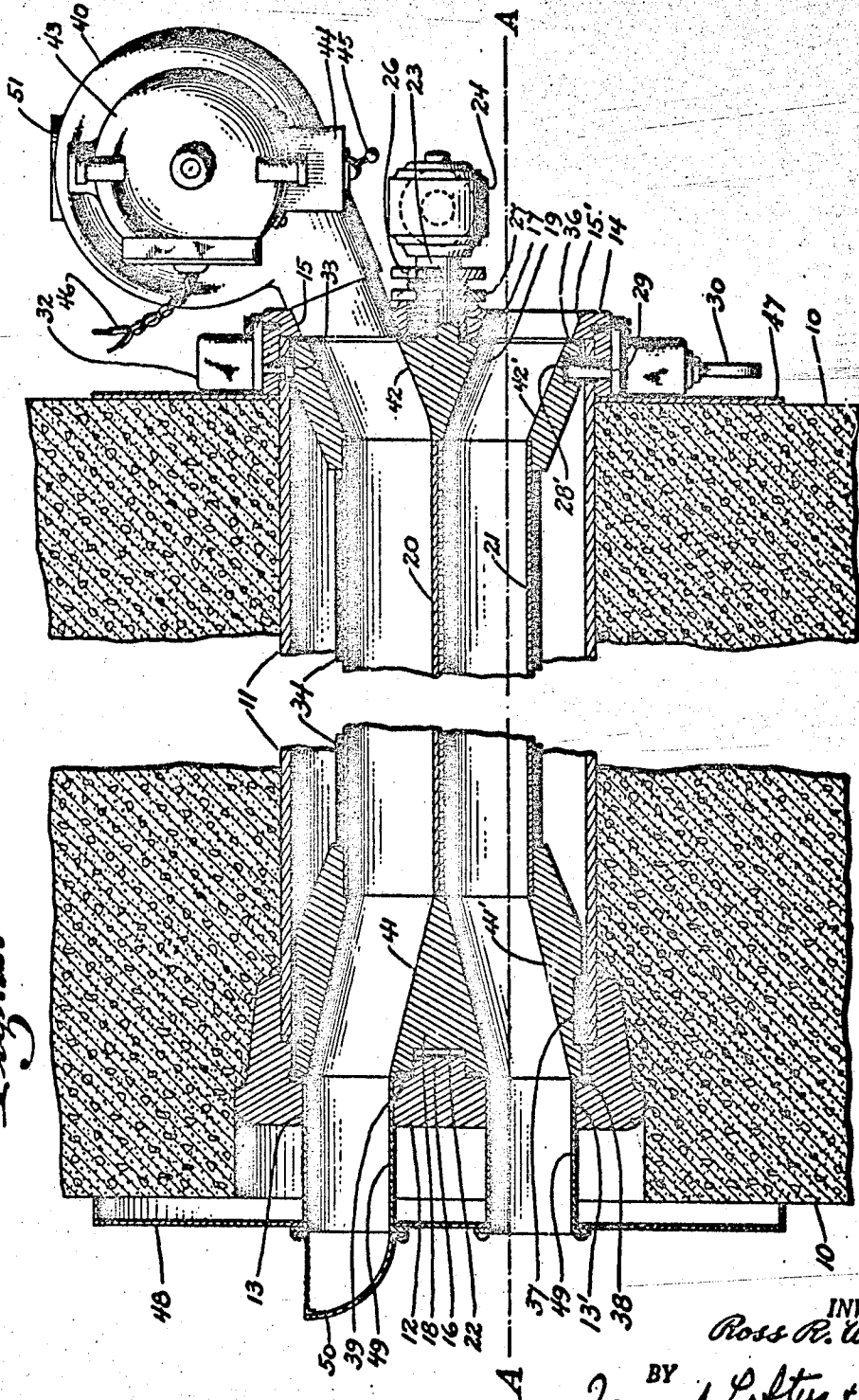
R. R. WEST

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Fig. 2.



INVENTOR
Ross R. West.
BY
Lounsbury, Loftis & Affett
ATTORNEYS.

Dec. 23, 1930.

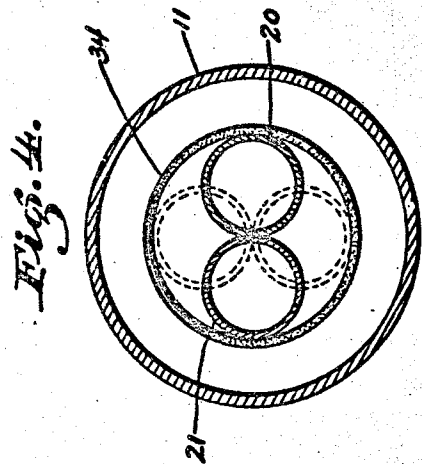
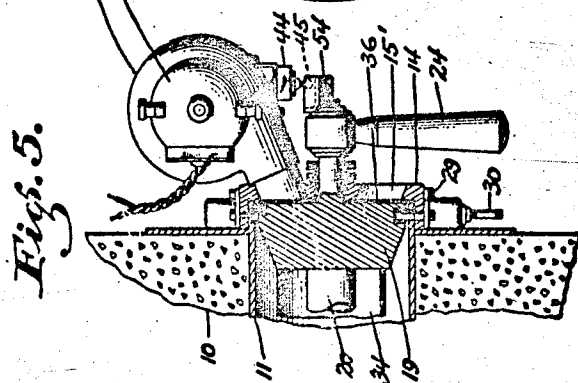
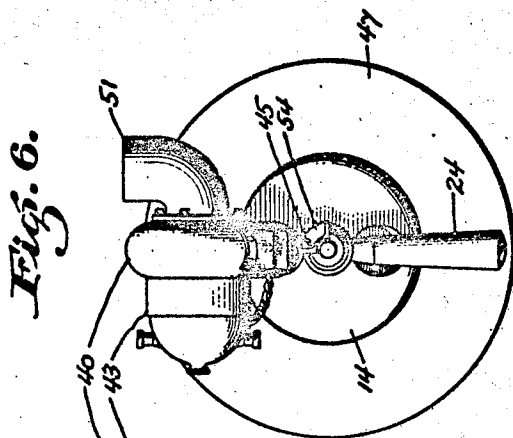
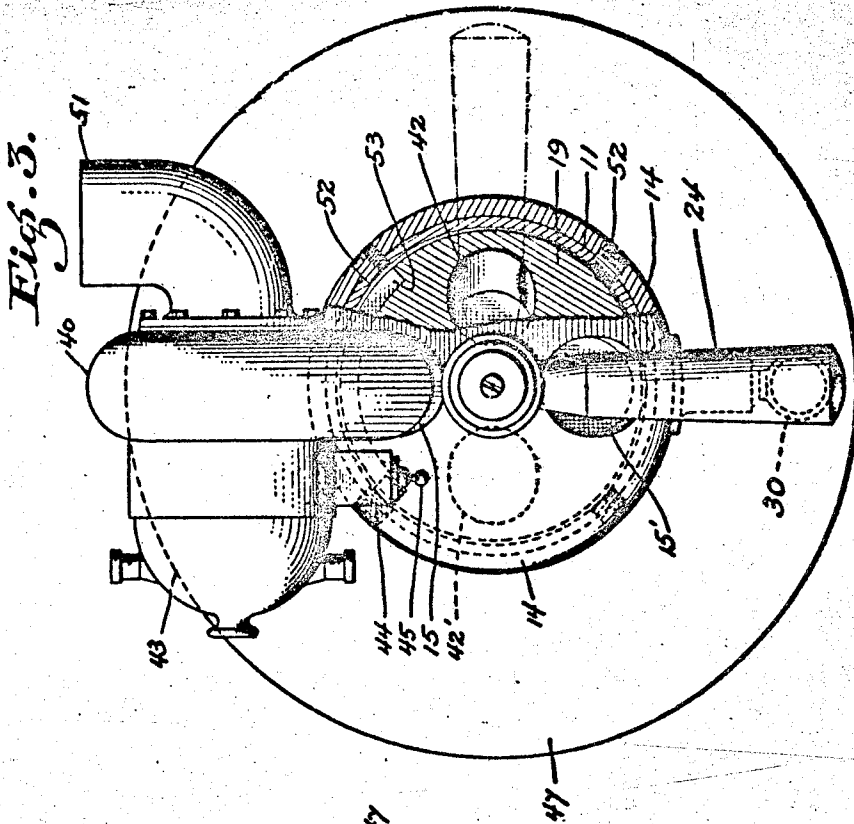
R. R. WEST

1,786,277

VAULT VENTILATOR

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3 Sheets-Sheet 3



INVENTOR.
Ross R. West.
BY
Lorenson & Loftis & Abett
ATTORNEYS.

UNITED STATES PATENT OFFICE

ROSS E. WEST, OF SAN MATEO, CALIFORNIA

VAULT VENTILATOR

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My invention relates to bank vaults and more particularly to an improved type of ventilating device such as is shown and described in my prior Patent Numbers 1,549,240, dated August 11, 1925, and 1,590,007, dated June 22, 1926.

Bank vaults, as at present constructed, must comply with certain rigid specifications which will render the vault substantially immune from successful attack by drills or metal cutting torches. It is also important that the vault be fire-proof and, as a result, such a vault will be practically air-tight when closed.

In order to make a vault of this type perfectly safe for the attendants and other employees to enter without fear of being suffocated, should they be accidentally or deliberately locked in the vault, it is necessary to provide means of ventilation so that fresh air can be delivered to the interior of the vault, should such a need arise.

In providing such ventilation, however, it is essential that the means adopted will not defeat the prime requisite of the vault, namely, security to its contents. It is therefore a consideration of my invention to provide a ventilating means which will permit the proper amount of ventilation and at the same time be of such a nature as not to weaken the vault. In my prior patents the ventilation of a vault is accomplished by the natural circulation of the air through an opening in the vault wall. Under ordinary circumstances this means of ventilation is sufficient, but under extreme conditions, such as are encountered in large vaults, I find that it is desirable to provide means for producing a forced circulation of fresh air into and out of the vault. It is therefore a further object of my invention to provide a means whereby the vault can be efficiently ventilated by a forced circulation of air, which means can be operated from within the vault and which will not render the vault susceptible to successful attack.

Other features and advantages will appear as the description, taken in connection with the accompanying drawings, proceeds. In these drawings, I have shown by way of il-

lustration a preferred embodiment of my invention, wherein—

Fig. 1 is a vertical sectional view of a vault wall showing my invention applied thereto and in its closed position,

Fig. 2 is a view similar to Fig. 1, showing my device in its open position,

Fig. 3 is an end elevation looking from within the vault and having a part broken away to expose a portion of the rotor element,

Fig. 4 is a sectional view of my device taken along line IV—IV of Fig. 1, and

Figs. 5 and 6 are partial views showing a modification of my device wherein the blower motor is automatically controlled by the rotor operating handle.

In these drawings like numerals refer to like parts throughout the several views.

Referring now to Fig. 1, 10 designates the wall of a vault. Projecting through the wall 10, I show a cylindrical sleeve 11 and secured to the outer end of this sleeve I provide a closure member 12 having a plurality of openings 13 and 13' which communicate with the interior of the sleeve 11. The inner end of the sleeve 11 projects slightly beyond the inner surface of the wall 10 and at this point I provide a second closure member 14 which also has a plurality of openings 15 and 15' which respectively align with the openings 13 and 13'. The closure member 12 is welded or otherwise secured to the cylindrical sleeve 11 and these parts are embedded in the wall 10 during the construction of the vault wall. A trunnion 16 is formed centrally of the member 12 and axially in alignment therewith I provide an opening 17 through the closure member 14. Mounted upon the trunnion 16 and in the opening 17, I provide a rotatable element which fits snugly in the cylindrical sleeve 11, but sufficiently free to permit it to be turned therein. This rotatable element comprises an outer casting 18, an inner casting 19 and a pair of steel tubes 20 and 21 which will cooperate with the openings 13, 13' and 15, 15', as will hereinafter appear. The tubes 20 and 21 are welded securely to the outer and inner castings 18 and 19 and thus form therewith a unitary rotatable struc-

ture. The casting 18 has a recess 22 into which the trunnion 16 extends and the inner casting 19 has a projecting stub shaft 23 which extends through the inner casting 14 and to which a handle 24 is securely attached against rotation by a key 25. Surrounding the stub shaft 23 is a bushing 26 having a lock nut 27 and securing it in place. The bushing 26 is threaded within the opening 17 and is adapted to be adjusted with respect thereto so as to hold the rotor element against axial displacement within the sleeve 11.

Mounted upon the inner closure member 14 and cooperating with recesses 28 and 28' in the inner casting 19 of the rotor element, I show a spring-pressed locking bolt 29 having a ring-shaped handle 30 and a spring 31 for maintaining it in one or the other of the above recesses. Opposite the bolt 29, I provide an alarm device 32 which will have contacts included in the usual electric alarm system of the vault. This device 32 has a plunger 33 which contacts with the casting 19 of the rotor element and is arranged to operate the alarm when the rotor element is turned into its vault ventilating position. In addition to the alarm device 32, I also provide other protective features in the form of a paper tube 34 having a plurality of alarm conductors arranged therein, which, if broken by a drill or the like, will set the alarm and a thermo-responsive cartridge 35 which will also set the burglar or fire alarm, should it be heated to a predetermined temperature as by a torch or other heat, the cartridge 35 being located in the outer casting 18 of the rotor element. I have also provided a number of packings about the rotor element which are adapted to prevent the introduction of any explosive gases or liquids into the vault. One of these packings is in the form of a disk 36 between the inner end of the rotor and the closure member 14. At the outer end of the rotor and surrounding the casting 18, I show a packing ring 37 which engages the inner surface of the cylindrical sleeve 11. A second such packing is also provided at 38, it being located at the outer edge of the rotor, and a third packing is in the form of a washer 39 surrounding the trunnion 16.

I have also shown a fan or blower 40 mounted upon the inner closure member 14, but for a better understanding of this feature of my invention, reference should be had to Fig. 2, wherein I show the rotor element as rotated into its vault ventilating position. In this figure of the drawing, it will be seen that the outer casting 18 of the rotor is provided with a plurality of openings 41 and 41' and that the inner casting 19 is also provided with a similar number of openings 42 and 42'. The openings 41, 41' and 42, 42' diverge and cooperate respectively with the openings 13, 13' and 15, 15' to form air circulating passageways via the tubes 20 and 21 with which

they also connect. The blower 40 is driven by an electric motor 43 and a switch 44 having a lever 45 is provided for controlling the motor support, current being supplied to the motor by means of conductors 46.

In the final assembly of my device I provide a finish plate 47 against the inner surface of the vault wall and against the outer surface of the vault wall I provide a second finish plate 48. In order to adapt my device to walls of various thicknesses and also to compensate for other variations, I provide short lengths of light tubing 49 which can be easily cut and inserted into the openings 13 and 13' to form a neat appearing exterior. I have also provided a deflector hood 50 which will deflect the air exhausted from the vault upwardly and thus insure a supply of fresh air at the intake opening 13'.

By referring to Fig. 3 of the drawings, it will be seen that the blower 40 has an intake manifold 51 which projects upwardly and which, as a result, will draw the air exhausted from the vault from its upper levels. In this figure the sectionalized portion shows two of four screws 52 which are used in holding the member 14 upon the extending portion of the cylindrical tube 11. An arcuate groove 53 is also shown into which a projection on one of the screws 52 projects to thereby limit the angular movement of the rotor element between its two extreme or opened and closed positions.

In Fig. 4 it will be seen that the paper tube 34 forms a complete protection for the tubes 20 and 21. The tubes 20 and 21 have been placed together, as shown in this figure, so that the diameter of the tube 34 can be reduced to a minimum, it being one of the underwriters' requirements that the wires of the alarm circuits, such as are carried by the paper tube 34, be not more than a predetermined distance apart, the dotted outline in this figure illustrating the position of the tubes 20 and 21 when the ventilating passageways are opened.

As a modification of my device, I have illustrated in Figs. 5 and 6 a means in the form of a sector 54 which will automatically start and stop the electric motor 43 as the rotor is moved to its ventilating or closed position. In this modification the switch 44 has been re-located upon the blower so that its operating lever 45 will be engaged by the sector 54. It should be understood, however, that this particular manner of accomplishing this feature of my invention is capable of many variations and that I do not wish to limit this aspect of my invention to the specific form illustrated.

The operation of my device is as follows, assuming that an attendant has been inadvertently locked into a vault. Under these circumstances the attendant would grasp the ring 30 and pull down the bolt 29, thereby

releasing the rotor element. He would then turn the handle 24 to the right into the position illustrated by dot and dash lines in Fig. 3, thus moving the rotor into the position shown in Fig. 2 and, in the absence of automatic control for the motor 43, he would throw the lever 45 into the motor starting position and the blower 40 would then be driven and exhaust the air from the upper part of the vault. As the air is exhausted from the vault, a difference of pressure will be created between the interior of the vault and the exterior, and, as a result, fresh air will be drawn into the vault through the lower or intake tube 21.

In addition to the above ventilating features, attention is also directed to the displacement of the holes 13' and 15' with respect to the tube 21 so as not to interfere with a line of vision from the interior of the vault, as indicated by the line A—A of Fig. 2, so that the attendant, in addition to receiving air, can also see and communicate with the exterior through the passageway so formed.

While I have shown the preferred form of my invention as now known to me, it is to be understood that various changes may be made in its construction without departing from the spirit of the invention as defined in the appended claims.

Having thus described my invention, what I claim and desire to secure by Letters Patent is—

1. The combination with a vault wall, of a rotor element having a plurality of openings therethrough, and means at the ends of said openings adapted to support said rotor in said wall and close said openings when the rotor is in one position.

2. The combination with a vault wall, of a rotor element having a plurality of openings therethrough, means at the ends of said openings adapted to support said rotor in said wall and close said openings when the rotor is in one position and having openings adapted to register with said first openings when said rotor is moved to a second position.

3. The combination with a vault wall, of a cylindrical opening through said wall, a rotor member within said cylindrical opening, members at the ends of said cylindrical opening having aligned openings therethrough, said rotor having openings adapted to register with said aligned openings, whereby a plurality of separate air passageways is established through the vault wall.

4. The combination with a vault wall, of a metallic sleeve embedded in and extending through said wall, a member for closing the outer end of said sleeve having a plurality of openings therethrough and a support extending centrally thereof, a rotor within said sleeve journaled upon said support having axially extending openings adapted to register with the openings in said closing mem-

ber, and means at the inner end of said sleeve whereby said rotor may be turned to thereby open or close said openings in said closing member.

5. The combination with a vault wall, of a metallic sleeve embedded in and extending through said wall, a member for closing the outer end of said sleeve having a plurality of openings therethrough and a support extending centrally thereof, a rotatable element within said sleeve journaled upon said support having axially extending openings adapted to register with the openings in said closing member, manual means at the inner end of said sleeve whereby said element may be turned to thereby open or close said openings in said closing member, and means whereby said element can be secured in either position.

ROSS R. WEST.

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