No. 711,457. Patented Oct. 21, 1902.

J. ARMSTRONG.

VAULT COVER.

(Application filed Mar. 14, 1902.)

(No Model.)

Fig 1.

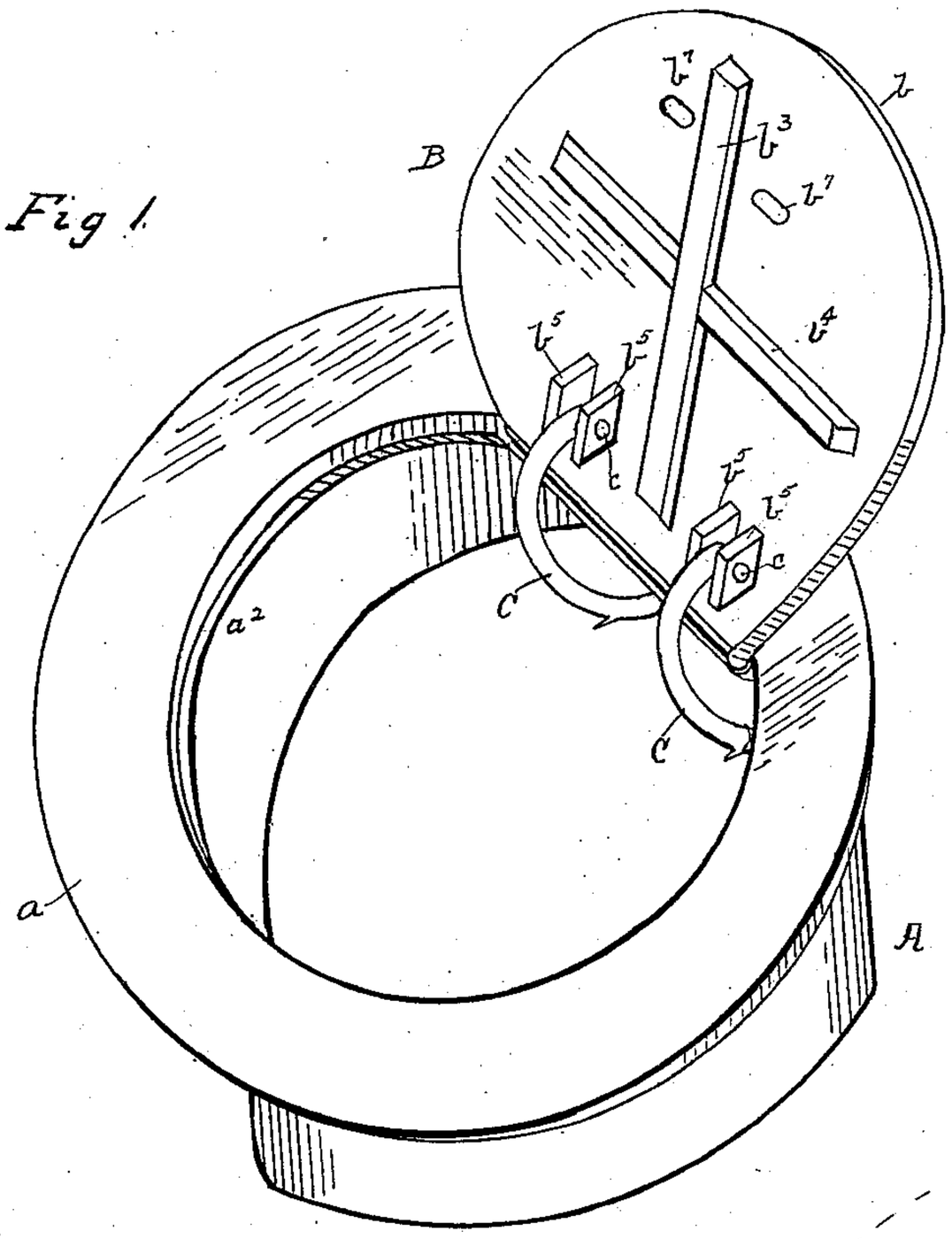


Fig 2.

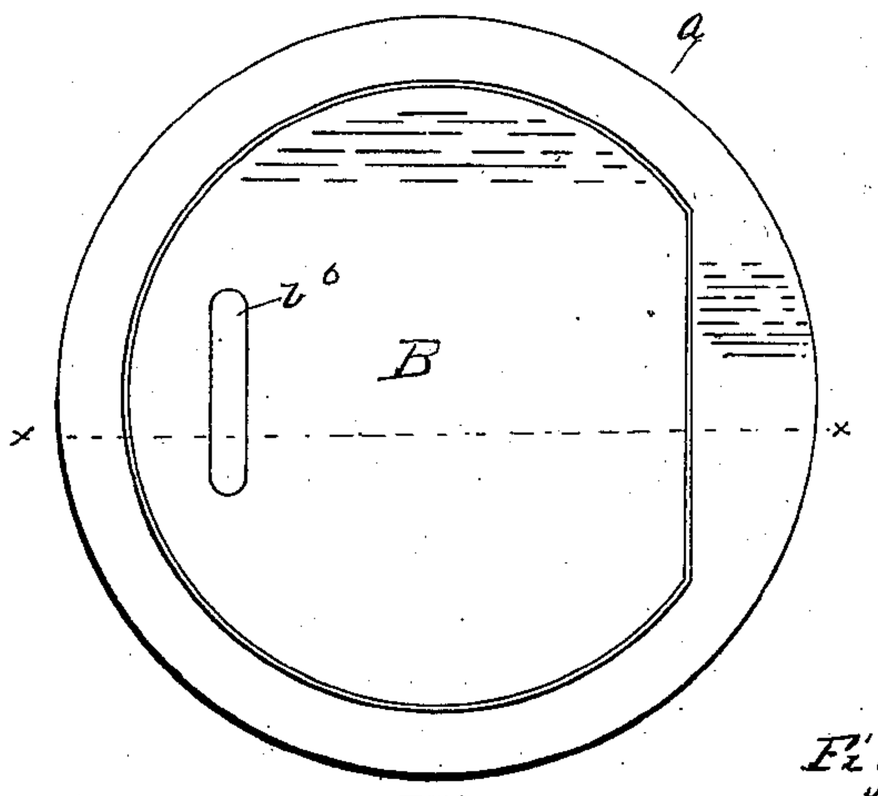


Fig 3.

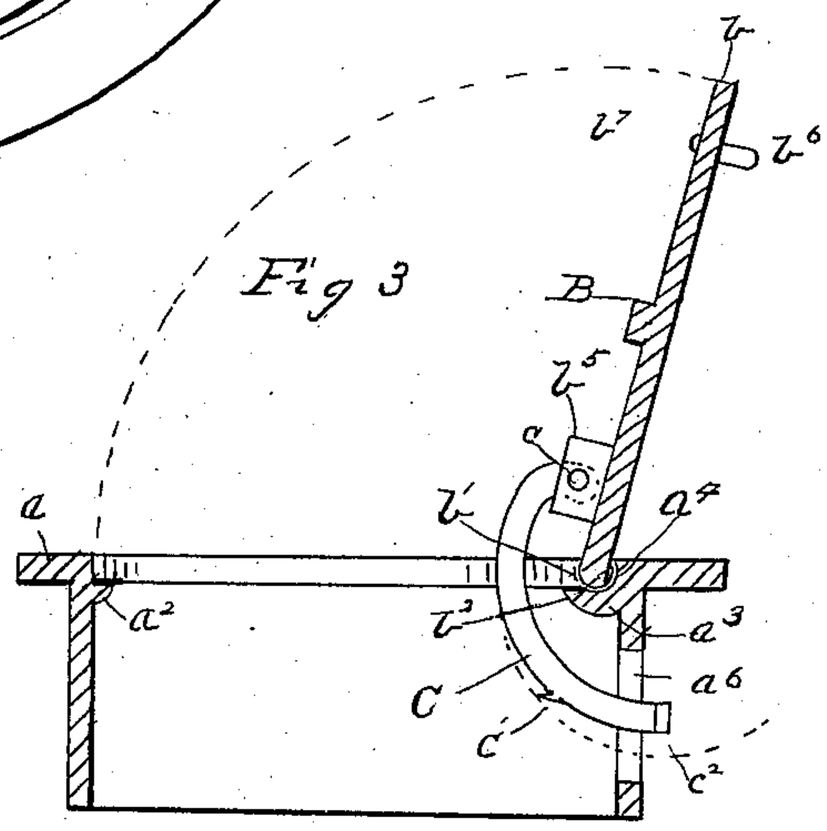
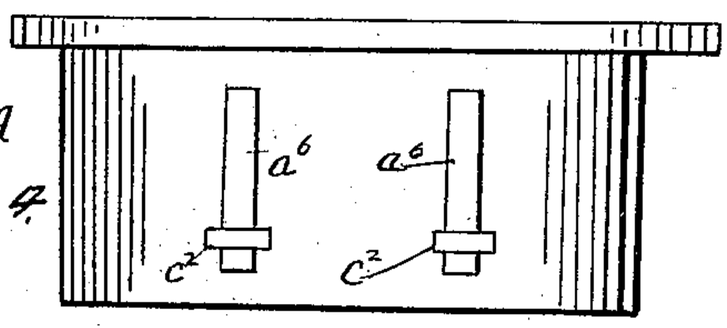


Fig 4.



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VAULT-COVER.

SPECIFICATION forming part of Letters Patent No. 711,457, dated October 21, 1902.

Application filed March 14, 1902. Serial No. 98,174. (No model.)

To all whom it may concern:

Be it known that I, JAMES ARMSTRONG, a citizen of the United States of America, residing at Kansas City, in the county of Jackson and State of Missouri, have invented certain new and useful Improvements in Vault-Covers; and I do hereby declare that the following is a full, clear, and exact description of the invention, such as will enable others to make and use the same, reference being had to the accompanying drawings, forming a part of this specification.

The object of my invention primarily is to remove the liability of a personal injury in falling within the opening to the vault when from the neglect and failure to remove the rubbish or other material from the sides of the opening the cover is left in a partially-closed position; second, to retain the cover at the desired angle of inclination when in an open position as a guard.

The invention consists in the novel construction and combination of parts, such as will be first fully described, and specifically pointed out in the claims.

In the drawings, Figure 1 is a view in perspective of a removable flanged casing or lining for the opening to a vault, showing the cover in an open position and the novel bearing and hinged connection with the casing. Fig. 2 is a plan view of the vault-cover and the flanged casing. Fig. 3 is a vertical sectional view of the vault-cover and the flanged casing for the opening to the vault, taken upon the line $x\ x$ of Fig. 2. Fig. 4 is a side view of the flanged casing, showing the openings for the hinged guiding and controlling devices on the cover.

Similar letters of reference indicate corresponding parts in all the figures of the drawings.

Referring to the drawings, A represents a cylindrical neck or casing for extending within the opening to a vault, which is made of the proper length and upon the upper edge of which is an outwardly-extended annular flange a. On the inner side of the casing A, in line horizontally with the under surface of the flange a, is a shoulder a^2. Extending from the shoulder a^2 upon one side of the casing a a short distance in the direction of the other side is a lip or bearing a^3, in the upper surface of which is a groove or depression a^4, extending tangentially to the line of the inner side of the casing A.

B represents the vault-cover, which, as shown, is circular in form, the distance around the outer edge b being slightly less than the circumference of the inner side of the casing A. A segment of the cover is cut away to form a bearing b' and extend within the groove a^4 in the lip a^3 on the inner side of the casing A, the side of the bearing b' being curved and extended outwardly, as at b^2, upon the inner side of the cover, so as to fit the groove when the cover is in a closed position.

Upon the inner side of the cover B are cast the strengthening-ribs $b^3\ b^4$, the rib b^3 extending from near the bearing b' of the cover toward the free end thereof. Upon the inner side of the cover, upon each side of the rib b^3 and a short distance from the bearing b' toward the free end of the cover, are lugs $b^5\ b^5$, in pairs. With each pair of lugs is pivotally connected by pivots $c\ c$ one end of the separate cover-controlling gravity-plates C C, which extend from said lugs in a downward direction and are curved outwardly in the arc of a circle. In the side of the casing A are the vertical slots $a^6\ a^6$, which extend downwardly to within a short distance of the lower edge of the said casing. The lower ends of the plates C C extend through the slots $a^6\ a^6$ in casing A, and upon said ends are transverse plates $c^2\ c^2$, which form stops and bear upon the outer surface of the said casing. On the lower end and forward edges of the plates C C are notches $c'\ c'$. In the free end of the cover are perforations $b^7\ b^7$, in which extend the ends of a bar b^6, the ends of which bar are bent at right angles and extend through said perforations and are upset upon the inner side of the cover, so as to be drawn a short distance outwardly, and for a lifting-handle.

The casing A, which is placed within the opening in the vault, is held in place by the flange a, which is nearly flush with the surface of the ground. The cover-controlling device being upon the under side of the cover offers no obstructions. When the free end of cover B is raised in an upright position by the handle b^7, the controlling-plates C C move

freely in the openings a^6 a^6 and at the proper angle of inclination of the cover to the flange a, which is slightly rearward of a vertical line extending through the side of the casing A when the transverse plates c^2 come into contact with the outer surface of the casing and retain the cover in position. The plates C C, in conjunction with the bearing a^3 for cover B, act as a hinge. When the free end of the cover is lowered in position and the rubbish left, so as to prevent the closing upon the shoulder a^2 of casing A, the raising of the bearing end b' of the cover from the groove or depression a^4, especially when the cover is vibrated sidewise by the rubbish, causes one plate C to depend lower in position than the other and the notch c' in the said plate to engage with the lower end of the slot. A vibrating movement of the cover occasioned from stepping upon one side or the other of the cover is checked by the plates C C and their movement arrested, so that in no possible way could the cover be upset and the frequent injury to a person's limb endangered by falling within the vault-opening. Should the cover be withdrawn from its groove a^4 and drawn forward by the handle, the plates C C prevent the cover from exposing the vault-opening and limits such a movement to a short distance. The plates C C also act to hold the bearing end b' of the cover in the groove a^4 by their weight suspended from the lugs b^5 b^5, so that the cover may be permitted to be wedged from place and then replaced in position without breaking the cover, which would occur from the ordinary hinged connection. The transverse plates c^2 c^2 upon the plates C C slide upon the outer surface of the casing A, and when the cover is lowered in position said plates assist in guiding the cover to its seat on the shoulder a^2 and also prevent the plates C C from wabbling, which would occur with simply a rod connection as soon as the rod became loosened from wear.

The invention is applicable to all forms of vault-covers and affords safety to all exposed openings in buildings provided with trap-doors.

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

1. The combination with a casing for vault-openings, having vertical openings, of a grooved lip upon the inner side thereof, and a shoulder, a cover having one edge thereof extending within said lip, lugs upon the under side of said cover adjacent to the said lip, and cover-controlling, outwardly-curved plates, pivotally connected at their upper ends with said lugs, and having their lower ends extending within the vertical openings in said casing, and transverse slidable plates on said ends upon the outer surface of said casing and upon opposite sides of said openings when the cover is open.

2. The combination with a casing for vault-openings, having vertical openings in the sides thereof, of an annular flange upon the upper edge thereof, a shoulder upon the inner side of said casing, and a grooved lip, a cover having an edge adapted to extend within said lip, lugs upon the under side of said cover, adjacent to said lip, in pairs, separate outwardly-curved, cover-controlling plates, pivotally connected at their upper ends with said lugs, and having notches in the curved surfaces of the plates, and extending within the openings in said case, and transverse plates upon the ends of said cover-controlling plates.

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