No. 687,842. Patented Dec. 3, 1901.

G. B. LINNEY.

SAFETY VAULT.

(Application filed Mar. 18, 1901.)

(No Model.) 4 Sheets—Sheet 1.

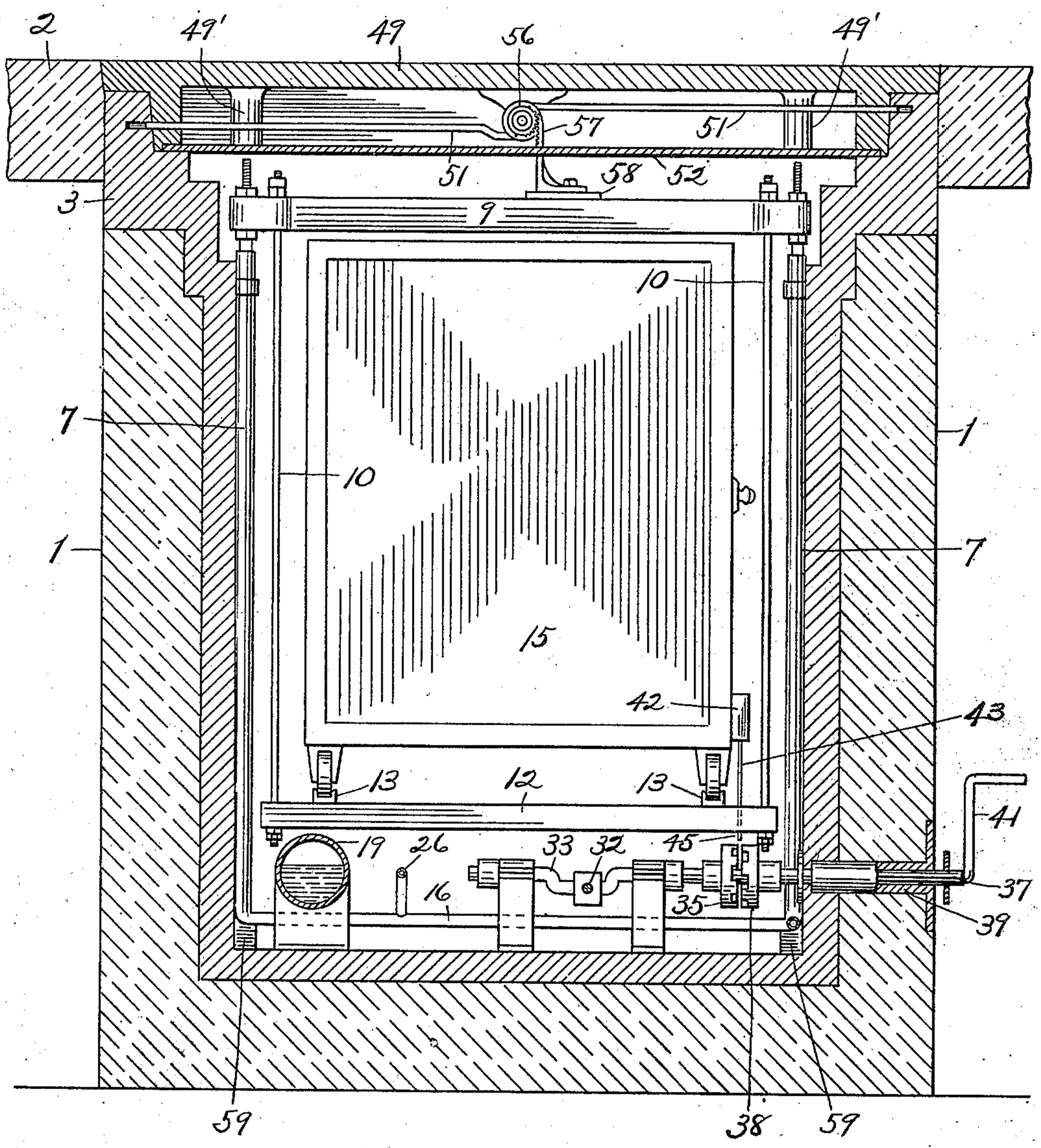

Fig. 1.

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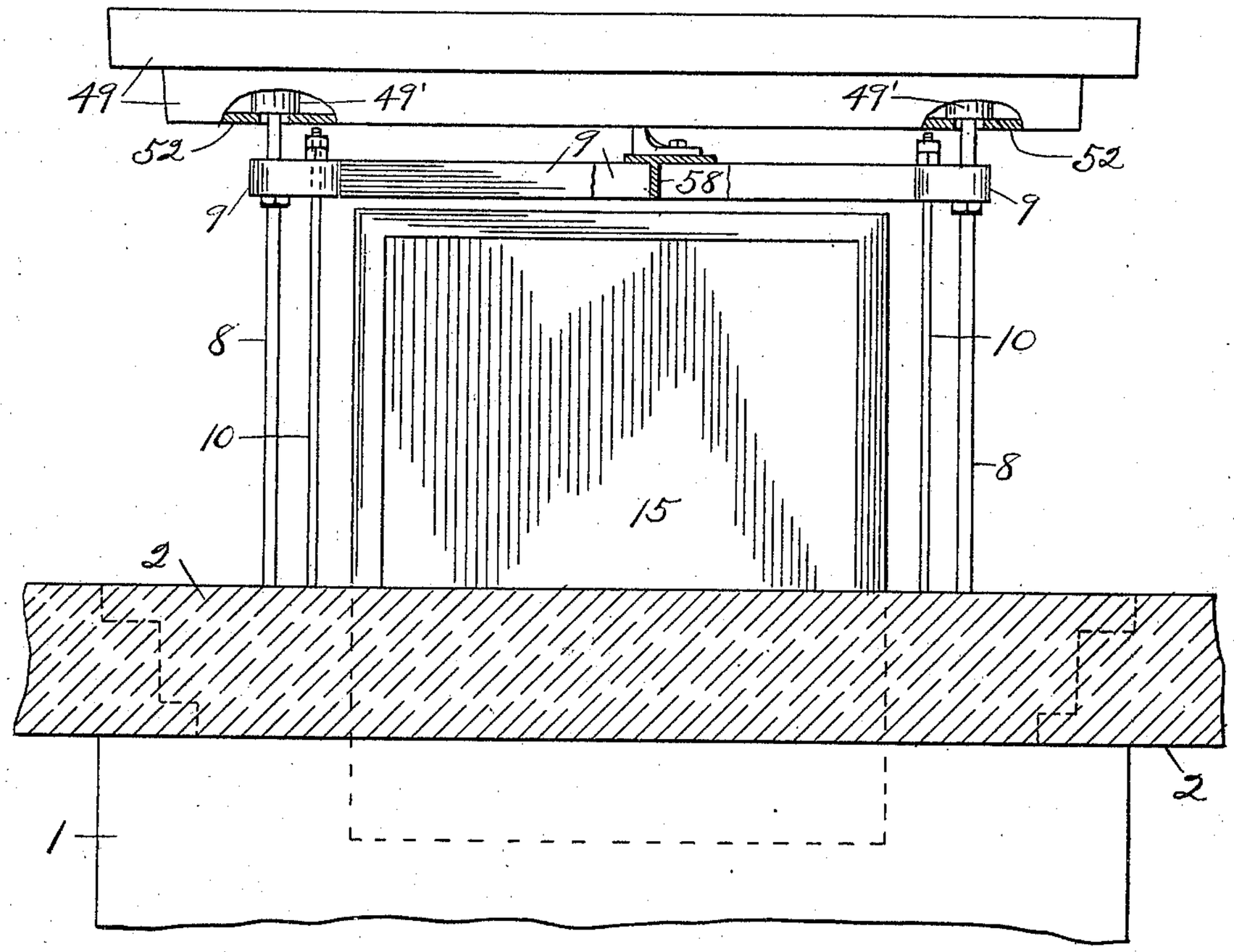
Fig. 2



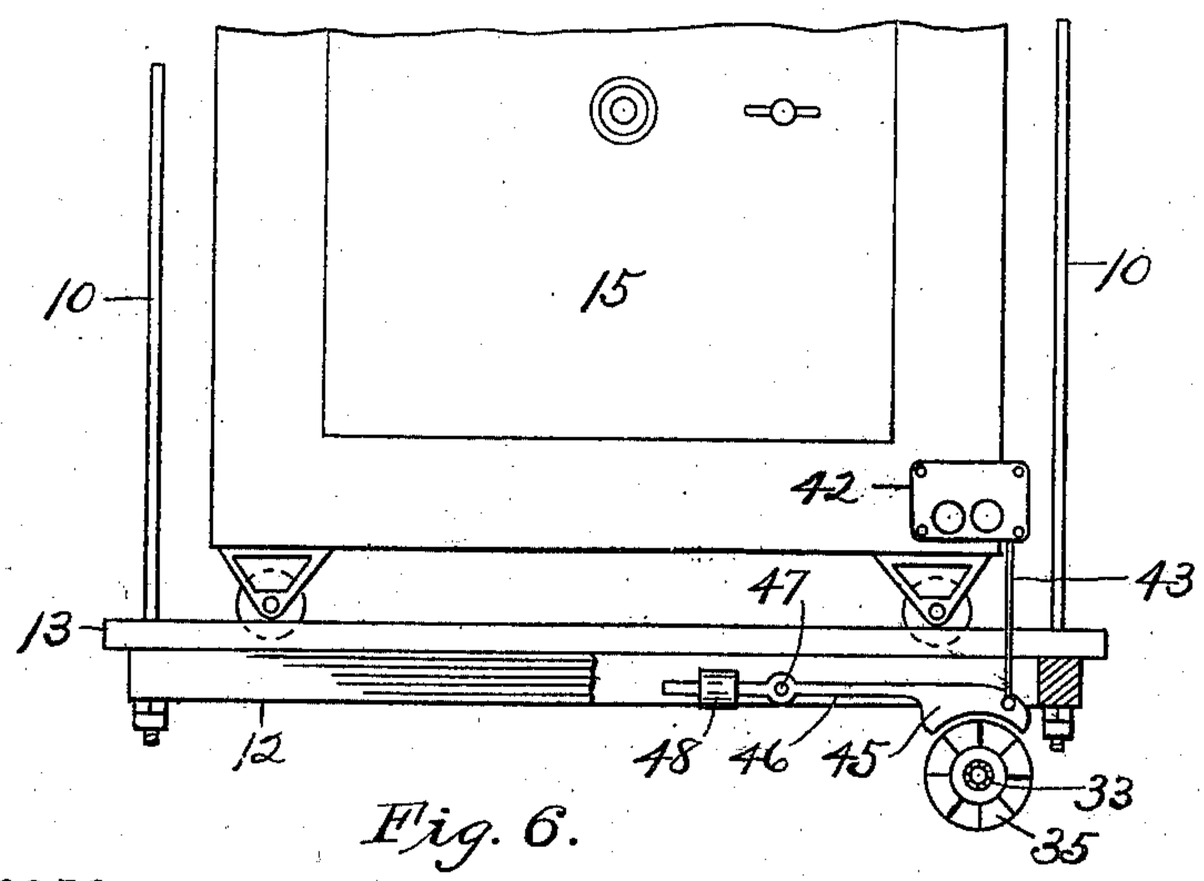


Fig. 6.

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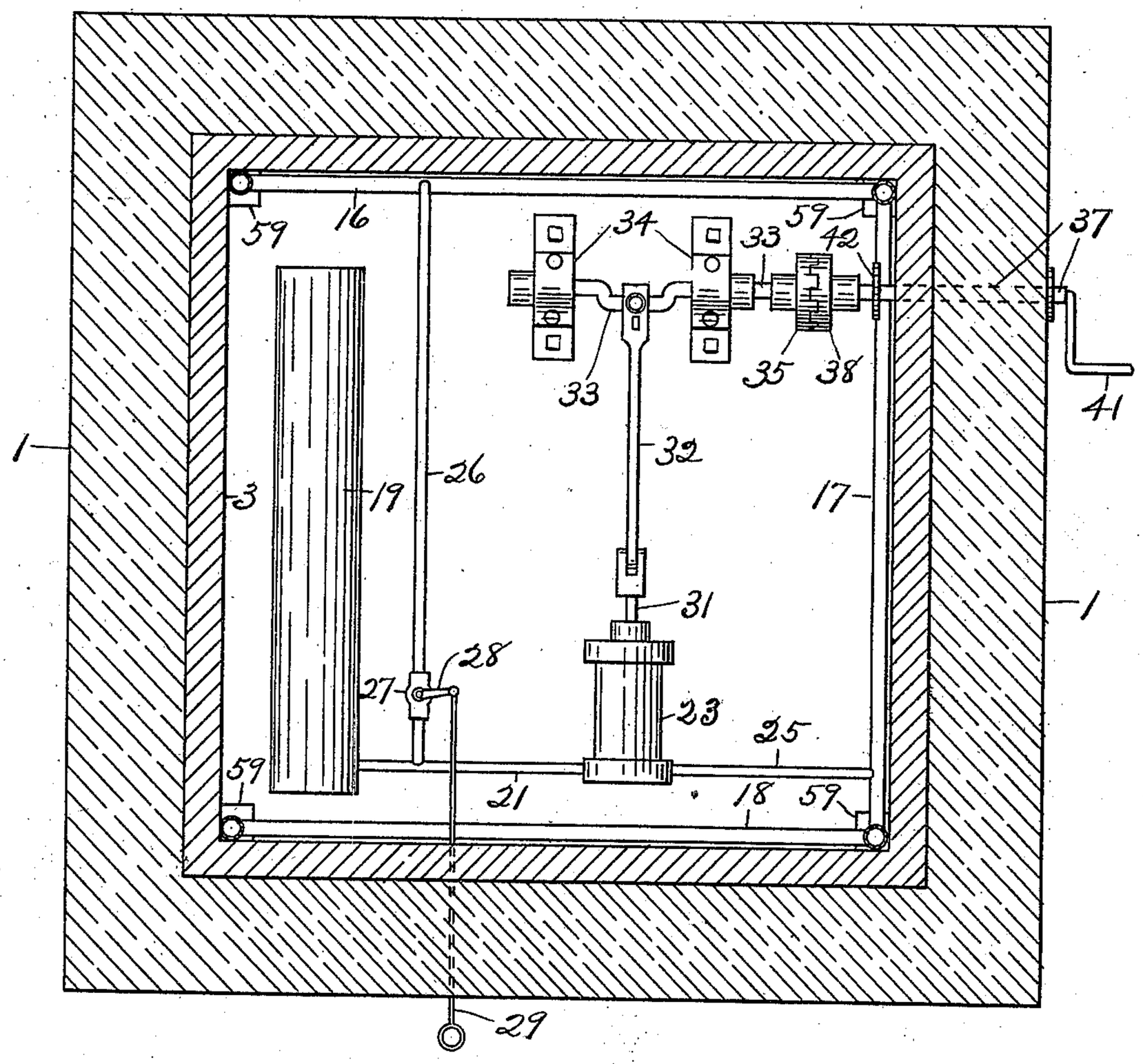
Fig. 3.



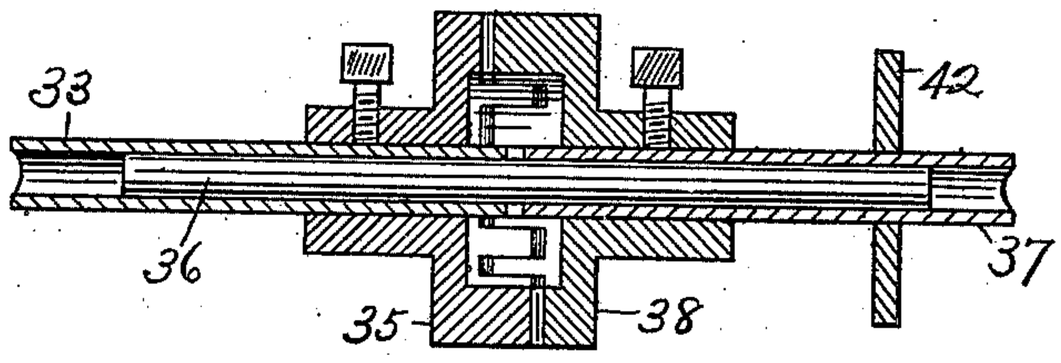


Fig. 4.

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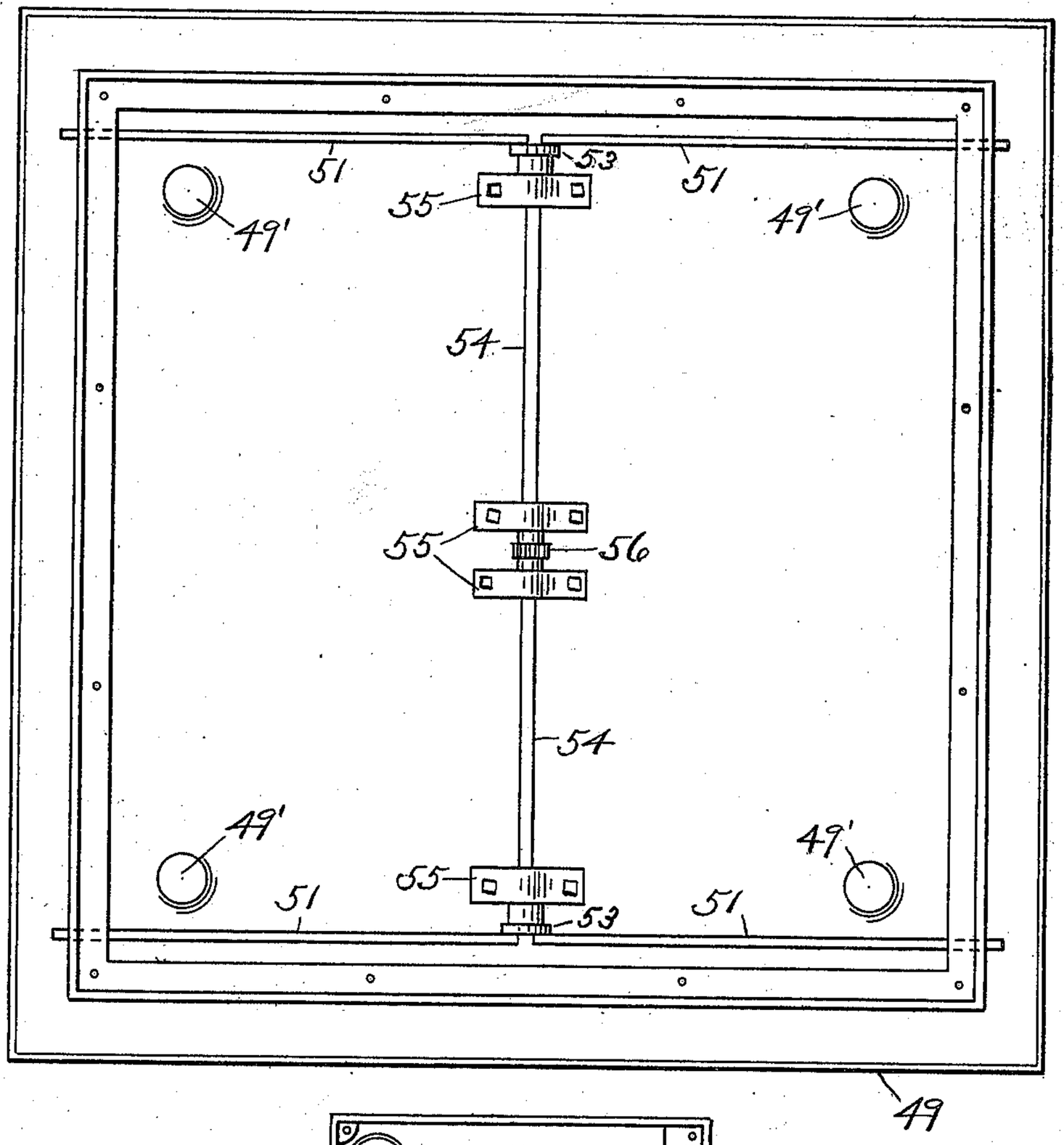
(No Model.) 4 Sheets—Sheet 4.

Fig. 5.



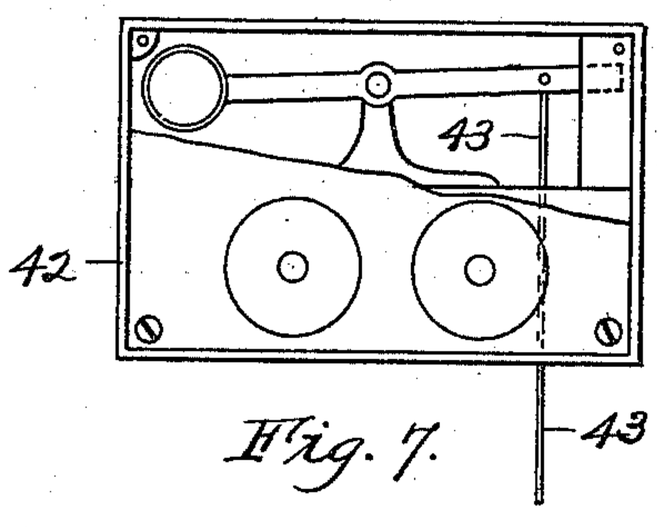


Fig. 7.

WITNESSES:

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UNITED STATES PATENT OFFICE.

GEORGE B. LINNEY, OF OSCEOLA, MISSOURI.

SAFETY-VAULT.

SPECIFICATION forming part of Letters Patent No. 687,842, dated December 3, 1901.

Application filed March 18, 1901. Serial No. 51,630. (No model.)

To all whom it may concern:

Be it known that I, GEORGE B. LINNEY, a citizen of the United States, and a resident of Osceola, in the county of St. Clair and State of Missouri, have invented new and useful Improvements in Safety-Vaults, of which the following is a specification.

My invention relates to improvements in that class of safety-vaults in which an ordinary safe is mounted upon an elevator which is raised by fluid-pressure acting through cylinders and pistons upon the elevator and in which the safe when in lowered position is surrounded by a vault of steel and masonry and covered by a heavy metal cap, so as to be inaccessible until raised by the means described hereinafter.

My invention comprises novel means for automatically locking said cap in the top of the vault when the safe is fully lowered and novel means, in connection with a time-lock secured to the outside of the safe, for preventing the pump from being operated except during the time for which the time-lock is set. The means I employ for locking and unlocking said cap comprises a set of locking-bolts operated by a rocker-shaft and a pair of crank-wheels, all of usual construction, a spur-pinion keyed on the rocker-shaft, and a rack rigidly secured to the frame of the safe-elevator for engaging the pinion when the safe is raised or lowered, and thereby to either shoot said bolts or to withdraw them from sockets provided therefor in the upper portion of the vault.

For raising the safe I employ several vertical cylinders provided with pistons which are secured to the safe-elevator and a pump for forcing a liquid into said cylinders, the pump being operated by rotation of a shaft which extends out through the wall of the vault and is provided with a hand-crank at its outer end, by which it may be rotated. Said shaft is made in two sections, the junction of which lies within the vault, and these sections are provided with clutch members which engage each other when the outer section of the crank-shaft is pushed in by the operator, forming a practically solid shaft. When the safe is in lowered position and the time arrives for setting the device which prevents the pump from being operated, the operator draws out the section of shaft to which the hand-crank is secured a sufficient distance to disengage the clutch members from each other and to separate them slightly. This permits a thin plate connected to the time-lock to drop between the clutch members, and thereby renders the pump inoperative until said plate is drawn up at the proper time by the mechanism of the time-lock.

I will now proceed to fully describe my invention with reference to the accompanying drawings, in which—

Figure 1 is a vertical sectional view of a vault constructed in accordance with my invention, showing the safe in fully-lowered position. Fig. 2 shows the safe and its elevator in a partly-raised position, the floor being in section and broken away and the cap partly broken away to expose the sockets for the piston-rods. Fig. 3 is a horizontal sectional view showing the apparatus in the bottom of the vault. Fig. 4 is an enlarged sectional view of the clutch and its divided shaft. Fig. 5 is a bottom plan view of the cap which closes the vault, the detachable plate of said cap being removed. Fig. 6 represents the safe-platform, the lower portion of the safe broken away, the time-lock secured to the safe, the clutch-separating device, and one member of the clutch, the platform being partly broken away to expose said plate. Fig. 7 is an enlarged view of the time-lock with its cover-plate partly broken away.

1 designates the outer wall of the vault, which outer wall may be of masonry or any preferred material, and 3 designates the inner wall of the vault, which is preferably constructed of steel and iron. The top of the vault is made flush with one of the floors 2 of the building, and the vault 1 3 rests on the next lower floor, or if 2 should be a basement-floor the vault is placed in a pit or chamber having sufficient space around the vault to give the operator access to a crank 41 and a valve-rod 29, which will be described hereinafter.

In the four corners of the inner vault 3 I secure four vertical cylinders 7, preferably of small diameter, as shown. (See Fig. 3.) Within each cylinder 7 is a slidable piston-rod 8, preferably fitting the bore of its cylinder throughout its length. From the up-

per ends of said piston-rods I hang the safe-elevator, which comprises two horizontal beams 9, each of which has its ends secured to two of the piston-rods 8, four depending tie-rods 10, passing through the beams 9, and a platform 12, supported by nuts on the lower ends of the tie-rods. Two rails 13 are mounted on the platform 12 for receiving the caster-wheels of the safe 15. The safe may be raised by forcing alcohol or other liquid into the cylinders 7 and lowered by opening a valve and permitting the liquid to escape from the cylinders, as described hereinafter. To this end the cylinders 7 are connected together at their lower ends by pipes 16 17 18. (All shown in Fig. 3.) A reservoir 19 for the operating fluid is provided and is connected by a pipe 21 to the inlet-port of a force-pump 23, which is connected by an outlet-pipe 25 to the pipe 17. To provide for the return of the liquid to the reservoir 19 when the safe is to be lowered, I connect pipe 21 with pipe 16 by a pipe 26, in which is connected a cut-off valve 27, operated through a lever 28 by a rod 29, which extends through a hole in the vault 1 3, so as to be accessible to the operator. When the safe is to be raised, valve 27 is closed and the pump 23 is operated, as described hereinafter. This draws fluid from the reservoir 19 and forces it into the piston-cylinders 7, thereby raising the safe. When the safe is to be lowered, the operator opens valve 27 by means of rod 29, and the fluid is thus admitted to the reservoir, into which it is forced by the weight of the safe on the pistons 8. A suitable stop or buffer may be placed in the bottom of the vault for preventing the platform 12 from touching the reservoir 19 or pump 23.

The preferred means for operating the pump 23 is as follows: Its piston-rod 31 is connected to a pitman 32, which is connected to a cranked shaft 33, journaled in boxings 34. A clutch member 35 is rigidly secured on shaft 33 near one of its ends, as shown in detail in Fig. 4, from which it will be observed that the portion of shaft 33 adjacent to clutch member 35 is tubular for the purpose of receiving a guide-pin 36, which extends into another tubular shaft 37, and thereby holds said shafts in alinement with each other and assists in the proper engagement of clutch member 35 with a similar member 38, rigidly secured on shaft 37. Shaft 37 is mounted rotatably and slidably in a sleeve 39, which is embedded in the masonry 1 and may be secured to the metal casing 3 in any preferred manner. The guide-pin 36 is secured to either shaft 33 or 37, but not to both, in order to permit longitudinal motion of shaft 37. A hand-crank 41 is secured to the outer end of shaft 37 for rotating said shaft and for moving it in or out to engage clutch member 38 with member 35 or to release it therefrom. In Fig. 1 the clutch members are shown separated, while in Fig. 3 they are shown interlocked. When the clutch members are thus interlocked, the pump 23 will be operated by turning the crank 41; but if the clutch members were separated by pulling out the shaft 37 (the movement of which is limited by a collar 42, secured thereto) and a thin plate were inserted between the clutch members the pump could not be operated until such plate was withdrawn. To effect this means for preventing operation of the pump 23 during certain times, I secure a time-lock 42 of ordinary construction to the safe 15, near the bottom thereof, as shown in Fig. 6. A small depending rod or wire 43 has its upper end connected to the usual oscillatory lever forming a part of a time-lock, said lever being actuated by the clockwork in the casing of the lock and said rod or wire hanging down through an opening in the clock-case. In a time-lock as commonly used the function of said lever is to prevent the bolts in a safe-door from being retracted except at certain times; but as I employ the time-lock its function is to alternately raise and lower the rod or wire, to the lower end of which is connected a separator-plate 45, secured to a lever 46, which is pivotally mounted at 47 and is provided with an adjustable counterweight 48 for balancing the weight of the plate 45 and the rod 43. Said rod and plate are so adjusted that when the rod is lowered by the action of the time-lock 42 the plate 45 rests upon the clutch members 35 38 if they are interlocked or drops between them if they are separated. The lock 42 is set so that the rod 43 will be lowered during the interval between office hours, (or for any other desired time,) and at the expiration of such time the rod will be raised by said lock, thereby lifting plate 45 up from between the clutch members 35 38. If the plate 45 were next lowered before the clutch members 35 38 had been separated, it would be necessary for the operator to pull out shaft 37, and thereby separate said members, in order to permit the plate 45 to fall between them. It will then be impossible to raise the safe 15 until the time-lock 42 lifts the plate 45 from between the clutch members 35 38.

Referring to Figs. 1 and 2, 49 designates a steel cap which forms a closure for the vault when the safe 15 is in fully-lowered position, at which times the cap rests in the top of the vault, as shown in Fig. 1. The cap 49 is not secured to the safe-elevator, but is raised thereby when the elevator ascends, as shown in Fig. 2. The cap is raised and supported when in raised position by the piston-rods 8. When the safe-elevator is in fully lowered position, the cap 49 is automatically locked in the metallic vault 3 by bolts 51, operated by mechanism to be described. The cap 49 is made hollow, substantially as shown, and its lower face is formed by a detachable plate 52, in which are four openings through which the upper ends of the piston-rods 8 extend

except when the safe is fully lowered. Four bosses 49′ are formed in the cap 49 to form points of support for the cap when it is raised. Fig. 5 represents a bottom plan view of the cap 49, the plate 52 being removed to expose the boltwork. The two pairs of bolts 51 are connected, respectively, to crank-wheels 53, secured on a rock-shaft 54, which is mounted in bearings 55. A spur-pinion 56 is keyed on shaft 54, preferably at or near the middle thereof. A vertical rack 57, provided with teeth for engaging the teeth of pinion 56, is rigidly secured to a cross-bar 58, secured to the beams. When the plate 52 is secured to the cap 49, as shown in Figs. 1 and 2, the rack 57 extends through a slot provided for that purpose in said plate. The number of teeth in this rack is just sufficient to rotate the pinion 56 far enough to throw or withdraw the bolts 51. When the safe is in its fully-lowered position, as shown in Fig. 1, nearly all the teeth of the rack 57 are below the pinion 56 and the bolts 51 are in their sockets in the vault 3. As soon as the safe commences to rise and before the piston-rods reach the bosses 49′ to lift the cap 49 the upward motion of the rack 57 rotates the pinion 56 far enough to cause the bolts 51 to be withdrawn, so that the cap may be raised. Conversely, when the safe is lowered to within about two inches of its lowest position the cap 49 is stopped by the steps of the inner vault 3; but the farther descent of the safe and of the rack 57 rotates the pinion 56 in the opposite direction to that described above, and thereby causes the bolts 51 to be thrown into their sockets.

The upper portions of the piston-cylinders 7 or of one of them may be made of glass, so that if an explosive be used in attempting to break into the vault at the top the glass portions of the cylinders will be shattered and permit the operating fluid to escape, so that the safe could not be raised even if the pump 23 could be operated. The cylinders 7 in the corners of the vault may be supported by blocks, as 59, or in any preferred manner.

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

1. In a vault, an elevator for a safe, a time-lock moved vertically by the elevator, a depending rod connected to the oscillating lever in the time-lock, a separator-plate moved vertically by said rod, a two-part shaft extending below said separator-plate, two clutch members secured respectively on each part of said shaft, one of said parts being movable longitudinally, and a pump operated by rotation of the other part of said shaft, said clutch members being so arranged that when they are separated by movement of one of the parts of said shaft, said separator-plate will hang between said clutch members when in its lowest position, substantially as described.

2. In a vault, a plurality of vertical cylinders containing pistons, a frame secured to the pistons, a platform hung from the frame, for supporting a safe, tubes connecting said cylinders together, a reservoir for an operating fluid, a pump, a tube connecting the pump to the reservoir, a tube connecting the pump to one of the aforesaid tubes, a return-tube connecting one of said tubes to the tube connecting the pump and reservoir together, a cut-off valve in said return-tube, and means for opening and closing said valve from the exterior of the vault; substantially as described.

3. The combination, with an open-topped vault, of an elevator therein, for raising and lowering a safe, a vertically-movable cap fitting in the top of the vault when said elevator is down, locking-bolts mounted in the cap, a rock-shaft for moving said bolts, a pinion secured on said rock-shaft, and a vertical rack, carried by said elevator, for engaging said pinion and causing said bolts to be withdrawn during its ascent and to be thrown into locked position during the descent of the elevator, substantially as described.

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

GEORGE B. LINNEY.

Witnesses:

LESLIE RODGERS,

S. R. LEWIS.