

(No Model.)

5 Sheets—Sheet 1.

H. J. COLBURN.
SAFE.

No. 568,429.

Patented Sept. 29, 1896.

Fig. 2.

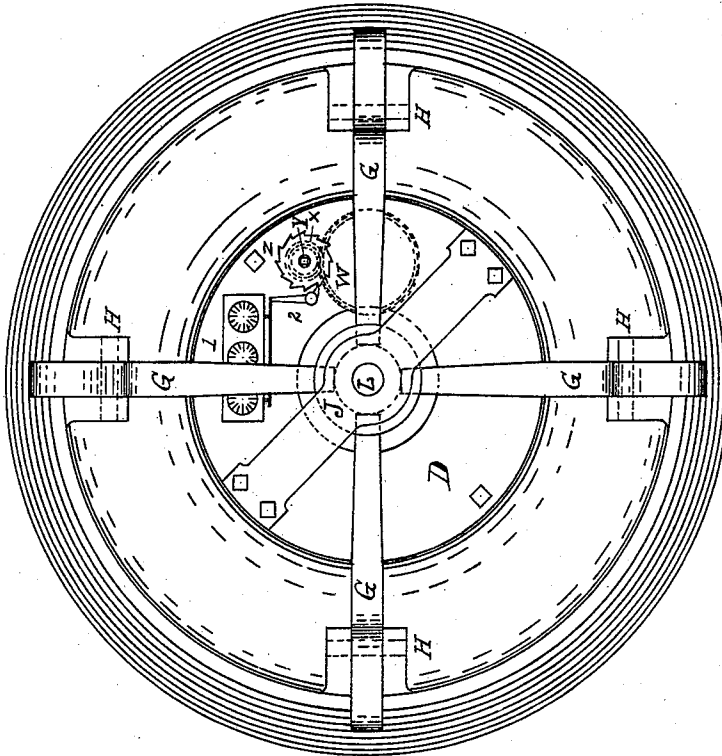
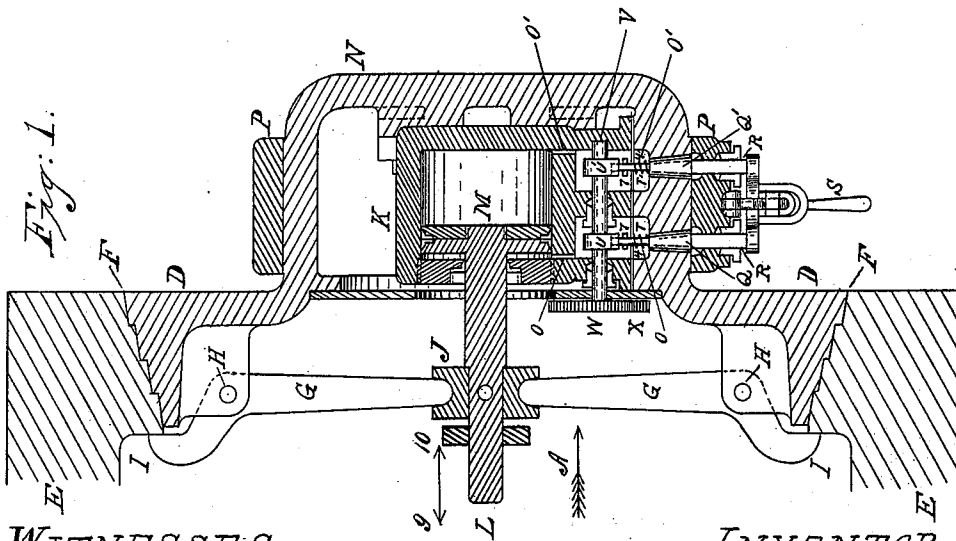


Fig. 1.



WITNESSES.

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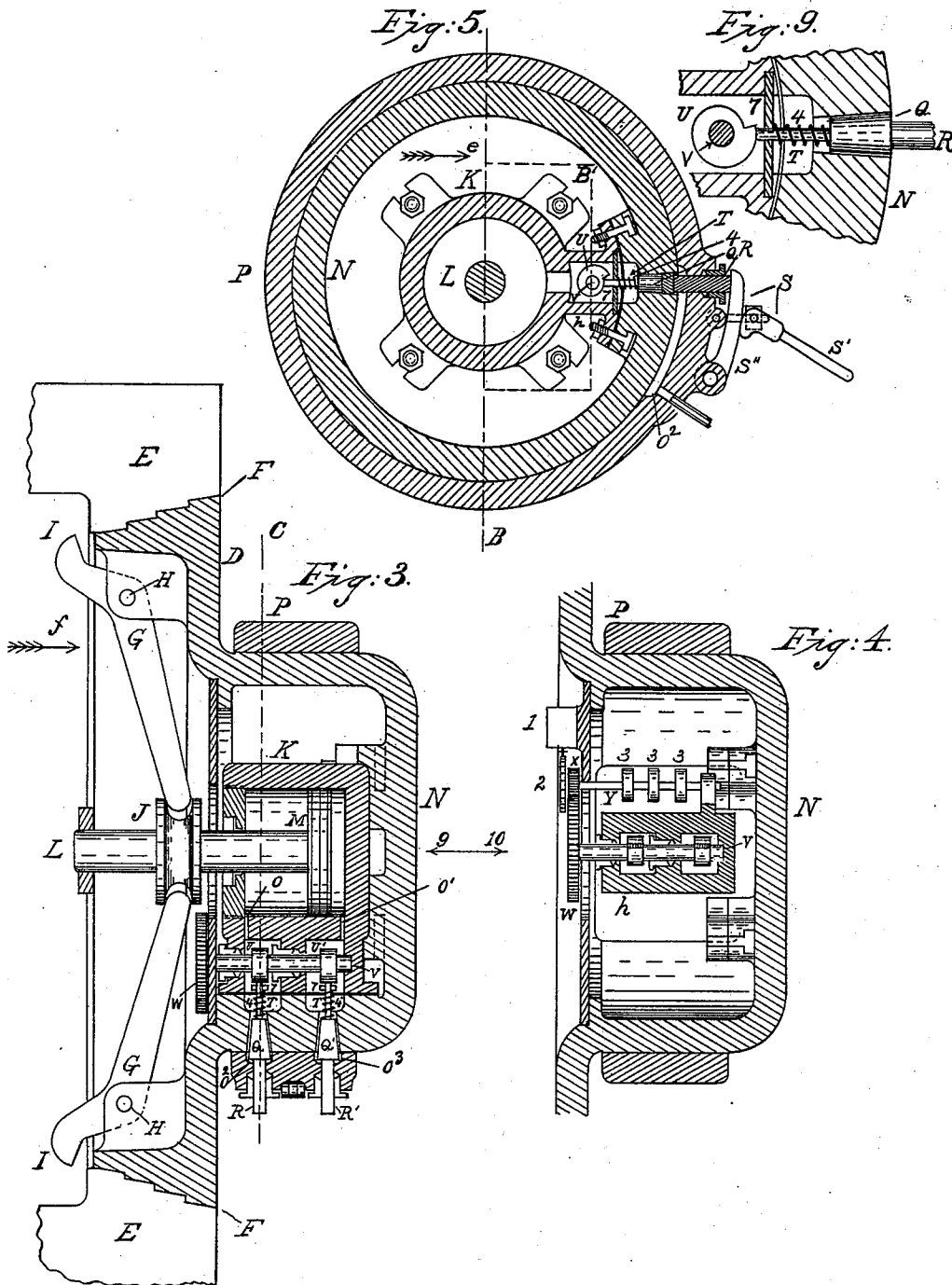
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Fig. 6.

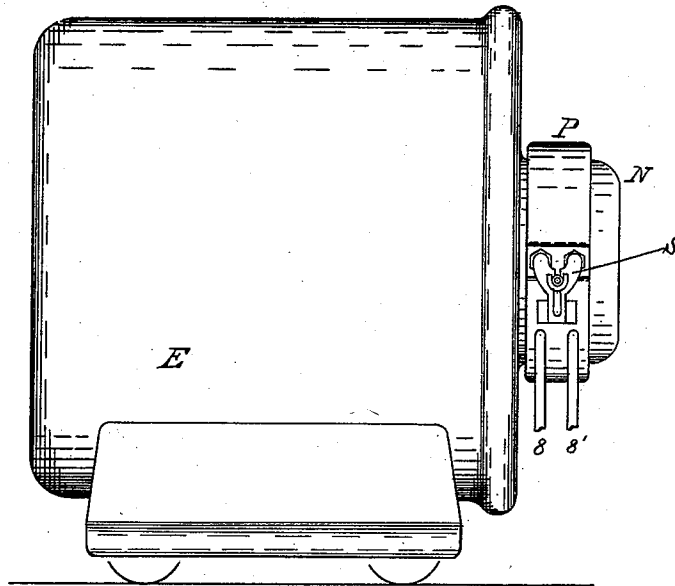


Fig. 7.

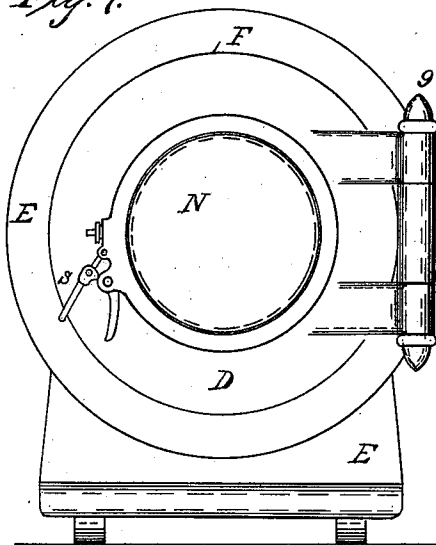
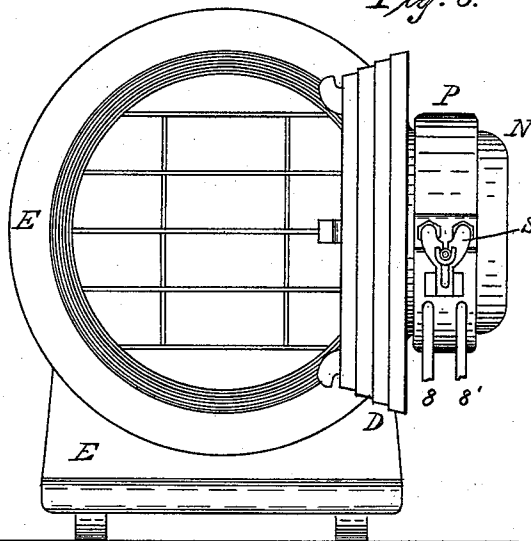


Fig. 8.



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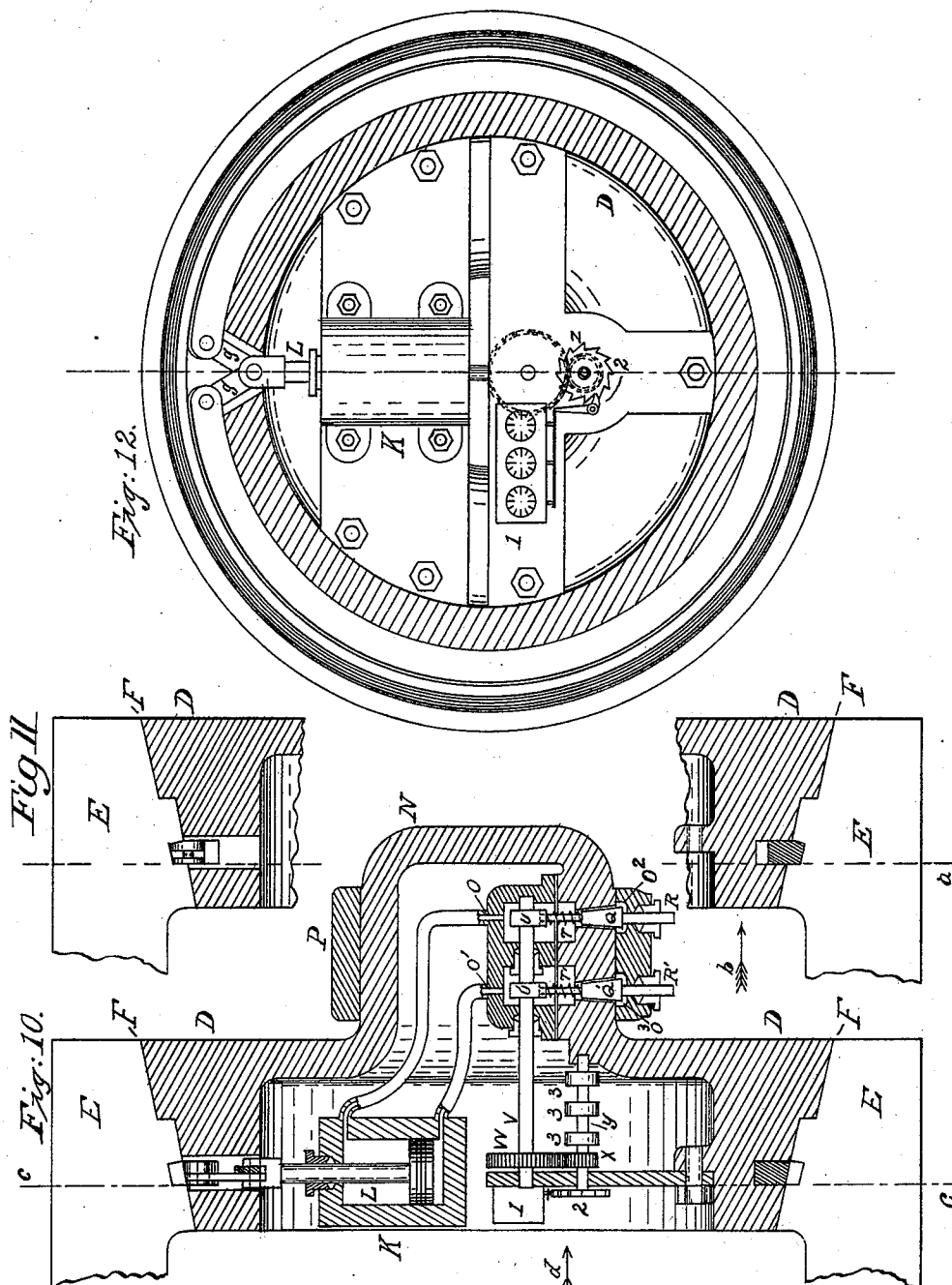
(No Model.)

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Fig. 13.

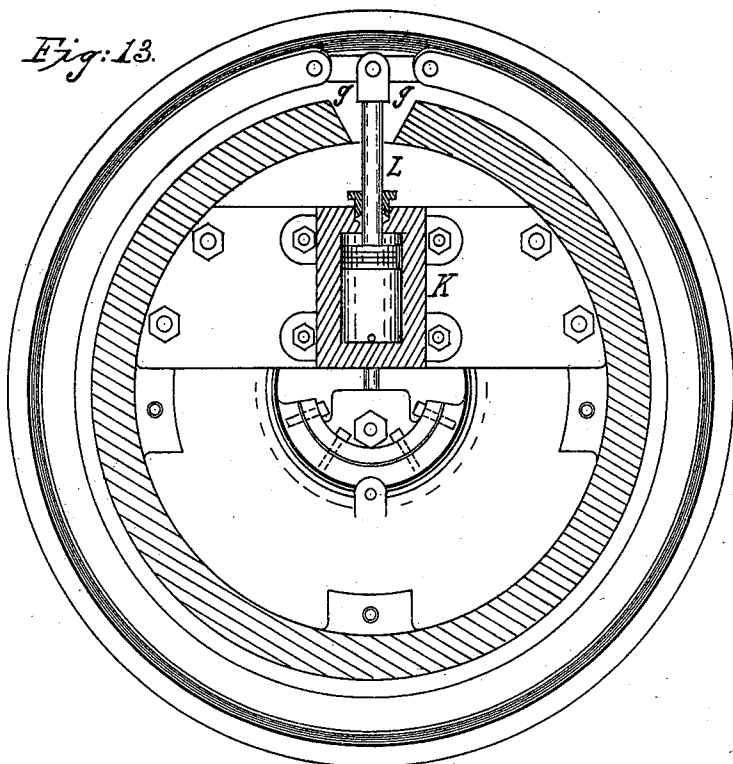
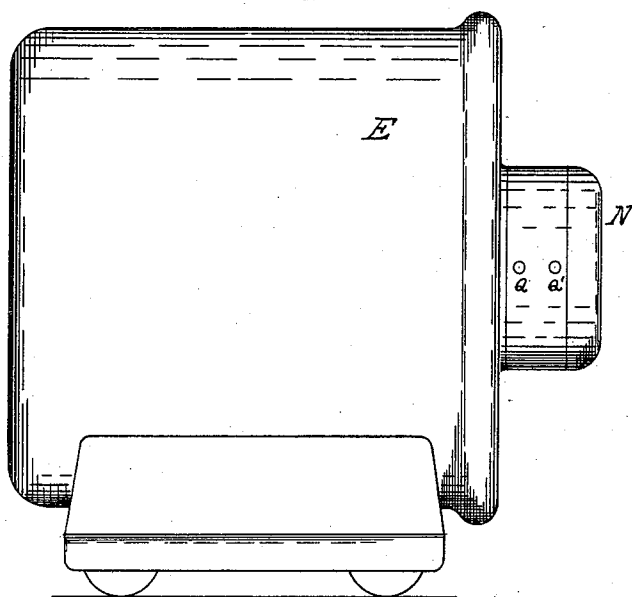


Fig. 14.



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UNITED STATES PATENT OFFICE.

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SPECIFICATION forming part of Letters Patent No. 568,429, dated September 29, 1896.

Application filed December 19, 1895, Serial No. 572,708. (No model.)

To all whom it may concern:

Be it known that I, HENRY J. COLBURN, a citizen of the United States, residing at Toledo, in the county of Lucas and State of Ohio, have invented certain new and useful Improvements in Safes; and I do hereby declare the following to be a full, clear, and exact description of the invention, such as will enable others skilled in the art to which it appertains to make and use the same.

My invention relates to improvements in burglar-proof safes and means of locking the doors of the same to the bodies of the safes of the variety wherein time-locks and combination-locks are employed in conjunction with other means for operating their closing and opening parts. The necessity for constructing the opening sections of such safes as strong as possible and for fitting and joining their contacting surfaces in the most perfect and improved manner in the arts of metal working and combining is constantly becoming more desirable and necessary.

The objects of my improvement are, first, to render the closely-fitted surfaces of such openings more efficient by providing means for more forcefully contacting them, to the end that they shall be better adapted to resist the burglar's arts of separation, which embody the uses of high explosives, wedges, screws, &c., in their most potent forms; second, to adapt and apply hydraulic force or compressed air or gases to the accomplishment of this end through appropriate mechanism, and to the locking and unlocking of the safe from the interior to the exclusion of keys and combination devices, if desired; third, to adapt such mechanism to be controlled by means of a combination or time lock respecting the time when it may be operated upon from without by said fluid force for the purpose of unlocking said safe, and, fourth, to so construct the said safe that when it has been locked by means of said fluid force operating from without through passage-ways through its door or casing connecting with its locking mechanism within the closing said fluid passage-ways may be closed against their being operated for the unlock-

ing of the safe from the exterior of the casing of the safe. I attain these objects by the mechanisms illustrated in the accompanying drawings, in which—

Figure 1 is a vertical section. Fig. 2 is a vertical elevation of the safe-door viewed in the direction of arrow A, Fig. 1. Fig. 3 is a vertical section similar to that shown in Fig. 1, but having its operating mechanism differently disposed. Fig. 4 is a vertical section of a portion of the door-case, showing the disposition of the time-lock on line B, Fig. 5, viewed in the direction of the arrow e. The part h of this view is cut on line B'. Fig. 5 is a vertical section of the door-case on line C, Fig. 3, viewed in the direction of arrow f. Fig. 6 is a side view of a safe having my improvements applied thereto. Fig. 7 is a front view of a safe having my improvements applied thereto. In this view the safe-door D is represented as closed. Fig. 8 is a front view of a safe having my improvements applied thereto. In this view the door D is represented as open. Fig. 9 is an enlarged view of part of the mechanism shown in Fig. 5. Figs. 10, 11, 12, and 13 represent modifications of my improvement wherein an expanding-ring is adapted to perform the office of the levers G in the before-described figures. In these figures where the parts and their operations are identical I have described them with similar letters. Fig. 14 is same view of safe shown in Fig. 6, but having band P, with its attachments, removed.

The case of this safe may be formed in any desired manner, and this closing mechanism is adapted to be applied to almost any variety of safe. I construct the housing of my safe from the best varieties of metal adapted to the purpose, combining toughness and hardness to the greatest attainable degree. Referring to the drawings, E is a casing of the safe, and D is its door.

At F the door is fitted to the casing of the safe upon tapered surfaces in a common well-known manner, but in this case necessarily the fitting should be as perfect as possible.

At G are levers pivoted, as at H, and at

their outer extremities I constructed so as to impinge against the case E, and at their inner and opposite extremities to connect with collar J.

5 K is a cylinder.

L is a piston-rod and connects piston M with collar J.

N is an outwardly-extending case, preferably a part of the door, within which is located the cylinder K and some other parts of the locking mechanism.

Through the cylinder K are fluid passage-ways O and O', which extend outward and continue through the extension N, and also into and through an external band P, (marked O²O³.) The parts of these fluid passage-ways which extend through the extension N are provided with tapered plugs Q and Q', which are ground and closely fitted to their seats within the extension N, and when so seated their outer extremities are flush or slightly within the exterior surface of the extension N. This position of said plugs is illustrated in Fig. 1, and the position of said plugs Q and Q', when moved outward and away from their seats to the farthest extent, is illustrated in Fig. 3.

R and R' are pressure-pins, separated from plugs Q and Q', but extending from said plugs outward through band P and connecting said plugs with a hand-lever mechanism S, which is illustrated in Figs. 1, 5, 6, 7, and 8, but most clearly in its operating connections in Fig. 5, where S S' is a hand-lever adapted to operate upon a second lever S'', which presses upon the head of a pin R, and the pin R upon the head of the plug Q, which it is adapted to seat, but not to unseat.

At T and T' are other pins connecting cams U and U' with plugs Q and Q'. Cams U and U' are both placed upon one operating-shaft V, upon the end of which is a gear W, adapted to mesh into and be operated by pinion x upon a shaft Y, and its office is to connect with a time-lock 1 through pawl 2. As this time-lock is of ordinary connection, and its office simply to release the pawl 2 from its hold upon the ratchet Z, its operation is sufficiently obvious without explanation.

Coil-springs 3 3 3 are placed upon the ratchet-shaft Y, and when the time-lock is wound and set to operate, the said shaft Y is also rotated, and the said springs 3 are strained for the purpose of operating to force outward the plugs Q and Q' through the agency of pinion x, gear W, and cams U and U', when at the proper time the said time-locks 1 shall have released, through pawl 2, the ratchet Z.

4 and 4' are springs upon the pins T and T'. These springs at one extremity impinge against plugs Q and Q', and at their other extremity against bars 7 and 7'. These springs are intended to exert light pressure upon the inner extremities of plugs Q and Q', and their office is to prevent the said plugs from

seating while fluid is passing them to the cylinder K.

The door N is hung upon hinges 9, and is adapted to be swung by hand from the position shown in Figs. 6 and 7 to that shown in Fig. 8. 8 8', Figs. 6 and 8, are pipes leading from some external source of hydraulic pressure and adapted to be connected with fluid passage-ways O O' O² O³ at times when the interior mechanism of the safe is to be operated.

In order to render all of the fluid-operating mechanism practically operative, all necessary glands, stuffing-boxes, and packing are provided, such as are necessary in the operation of such machinery.

The operation of this mechanism is as follows: The door having been closed, as shown in Figs. 7 and 8, connection is made with a pump or any source of fluid-pressure to the fluid-passage 8', the piston M being presumed to be in the position shown in Fig. 3, and the time-lock having been wound and connected with pawl 2, and the cam adjusted in position, as shown in Fig. 5, and the plug Q' in position, as shown in Fig. 3. This pressure will force the said piston-head in the direction of arrow 9, Fig. 1, carrying the piston-rod L, collar J, and arms G in the same direction and forcing the outer extremities I of levers G up to and in contact with case E, when any continuance of said motion will cause the door D to be forced tightly within its case E. The safe is now locked, and to cut off further communication with the inside of same it is only necessary to seat the plugs Q and Q' by means of the cam-lever mechanism S, causing S'' to press against the outer extremities of said plugs through the medium of pins R and R'. In operating this mechanism it is necessary for both plugs to be in like position at same time, in order that the forcing-fluid may pass out from one end of cylinder K, while forcing-fluid may be passing within the other end of said cylinder K. The operating parts being now in the position shown in Fig. 1, with the outer ends of the plugs Q and Q' flush with the exterior of the surface of extension N, or preferably slightly within the same, it is obvious that all communication with the interior of the safe is cut off, and there being no outside means provided for the removal of the plugs Q and Q', they can only be removed by being operated upon from within, which process is as follows: When the proper time for the "time-lock" mechanism to operate arrives, it will operate to move the pawl 2, and thus release the ratchet-wheel Z, when the strained springs 3 will, through shaft Y, pinion x, gear W, shaft V, and cams U and U', force outward the plugs Q and Q' through the medium of pins T', when forcing-fluid may be sent through passage-ways O to the opposite face of piston M and cause it to move in the direction of arrow 10, Fig. 3, and reversely to the operation before described for closing,

causing the extremities I of levers G to release their hold upon the case E, when the door D may be opened by hand.

When this safe is locked, should the whole of band P and parts attached thereto be removed, as shown in Fig. 14, the removal of plugs Q and Q' would be next to impossible, especially when, as intended, said plugs and safe-case are all constructed of hardened materials.

The expanding-ring shown in Figs. 10, 11, 12, and 13 is designed to furnish an equivalent for the system of locking-levers G I (shown in Figs. 1, 2, and 3) and to operate in the same substantial manner. In the modification shown in Figs. 10, 11, 12, and 13 up to the point where the piston L connects with the knuckle-jointed levers g g, operating the ring, the parts and their operations are identical with those hereinbefore explained.

The word "hydraulic" wherever employed in the foregoing specification is used generically and is designed to include means and mechanism operated by elastic as well as non-elastic fluids.

Having thus described my invention and the best manner of carrying it into operation, what I claim, and desire to secure by Letters Patent, is—

1. In a burglar-proof safe a closing door or section accurately and closely fitted to seat upon a contacting surface, in combination with hydraulically-operated means and mechanism within the safe for powerfully seating and securing the door, and means outside the safe for supplying hydraulic pressure for operating the aforesaid means and mechanism, substantially as and for the purposes specified.

2. In a burglar-proof safe, the combination, with the accurately-fitted door thereof, of hydraulic mechanism contained within the safe for forcibly seating and securing the door from within, and for releasing the same, and passages provided in the door or wall for introducing and circulating the fluid means for operating the said hydraulic mechanism under pressure from the outside, without other necessary apertures or external means for opening, such as keyholes or combination devices with means for closing the said passages, substantially as and for the purposes specified.

3. In a burglar-proof safe, the combination with the accurately-fitted door thereof, and hydraulic mechanism within the safe for seating, securing and releasing the said door, of passages through the door or wall for introducing the fluid for operating the hydraulic mechanism from without, and means for closing the said openings or passages externally against tampering with the hydraulic mechanism from the exterior for unlocking the safe, substantially as and for the purposes specified.

4. In a burglar-proof safe, the combination

with an accurately-fitted door or section and hydraulic mechanism contained within the safe for forcibly seating, locking and unlocking the said door or section, of time mechanism controlling the said hydraulic mechanism as to the periods when the same may be operated from without for the purposes of securing or releasing the said locking and unlocking mechanism, substantially as and for the purposes specified.

5. In a burglar-proof safe provided with hydraulic mechanism contained within the safe as the means for locking and unlocking the same, passages or apertures in the wall or door thereof constituting the only channels of entrance and exit for the introduction and circulation of fluid means for operating the said hydraulic locking and unlocking mechanism by hydraulic pressure from without, and means for closing the said passages, substantially as and for the purposes specified.

6. In a burglar-proof safe, the combination of hydraulic locking and unlocking means contained within the safe, operated through closable passages in the wall or door thereof for the conveyance of fluid-pressure from the outside, and a time mechanism, controlling the said locking and unlocking means as to the times or periods when alone the said hydraulic means can be operated, substantially as and for the purposes specified.

7. In a burglar-proof safe, the combination of hydraulic locking and unlocking means contained within the safe, operated through passages in the wall or door thereof for conveyance of fluid-pressure from the outside, a time mechanism for controlling the said locking and unlocking means, and means for closing the hydraulic passages through the wall or door against tampering, substantially as specified.

8. In a burglar-proof safe, the combination of a casing, an accurately-fitted door or section D, a hydraulic cylinder and piston, borne upon the said door on the inside, passages leading from the outside for operating said piston by fluid-pressure, a piston-rod L, and locking means, as G I, for forcibly seating the said door and locking the same when the piston is operated by means of hydraulic pressure applied from the outside through the passages aforesaid, substantially as and for the purposes specified.

9. In a burglar-proof safe, the combination of a casing, an accurately-fitted door or section, as D, a hydraulic cylinder and piston borne upon the door on the inside, piston-rod L, locking means, as levers G I, passages O O' leading to the said cylinder from the outside for operating the locking means by hydraulic pressure from the outside, acting on the hydraulic mechanism, tapered plugs Q Q', located in accurately-fitted seats communicating with said passages, pins T T', cams U U', springs 3, 3, 3, and a time mechanism for

controlling the opening of the plugs Q Q', substantially as and for the purposes specified.

10. In a burglar-proof safe, the combination
 5 of a casing, an accurately-fitted door or section, as D, bearing an extension as N, a hydraulic cylinder and piston carried within
 the said extension, piston-rod L, locking
 means as levers G I, tapered plugs Q Q' lo-
 10 cated in accurately-fitted seats in the extension N, passages O O' leading from the exterior to the cylinder K, through the seats of
 the tapered plugs Q Q', pins T T', cams U U',
 springs 3, 3, 3, spring-bearing shaft Y and
 15 cam-bearing shaft V', and intermediate gearing, pinion *x*, ratchet Z, pawl 2, and a time
 mechanism, for controlling the opening of
 the plugs Q Q', through the pawl 2 and
 ratchet Z, all substantially as specified.
 20 11. In combination with the door D of a
 burglar-proof safe, having extension N, tapered
 plugs Q Q', in accurately-fitted seats,
 passages O O', hydraulic cylinder K and piston
 M, and time mechanism controlling the
 25 operations of the latter, the removable band
 P, having passages O² O³, plugs R R', bearing
 on the tapered plugs Q Q', lever S'', and
 cam-lever S, for seating the said tapered

plugs beyond tampering when the band is removed, all substantially as and for the purposes specified.

12. In combination with the door of a burglar-proof safe, having thereon an integral
 extension, as N, bearing within a hydraulic
 locking and unlocking apparatus, and a time
 35 mechanism controlling the latter, as to the
 times when fluid-pressure may be admitted
 to the same through apertures stopped by
 tapered and fitted plugs as Q Q' flush with or
 below the outer surface of the extension when
 40 fully seated, a removable band or ring, having
 supply-passages O² O³, plugs R R', lever
 S'', and a cam-lever S, for forcibly seating the
 said tapered plugs and thus preventing access
 to the safe by external means until by
 45 action of the time mechanism the hydraulic
 mechanism is again set free to be operated,
 and to release the door from within, substantially
 as specified.

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

HENRY J. COLBURN.

Witnesses:

JOHNSON THURSTON,
 ANNA D. VAN ETEN.