(No Model.)

2 Sheets—Sheet 1.

G. W. WOOLEY.

LOCK.

No. 446,375. Patented Feb. 10, 1891.

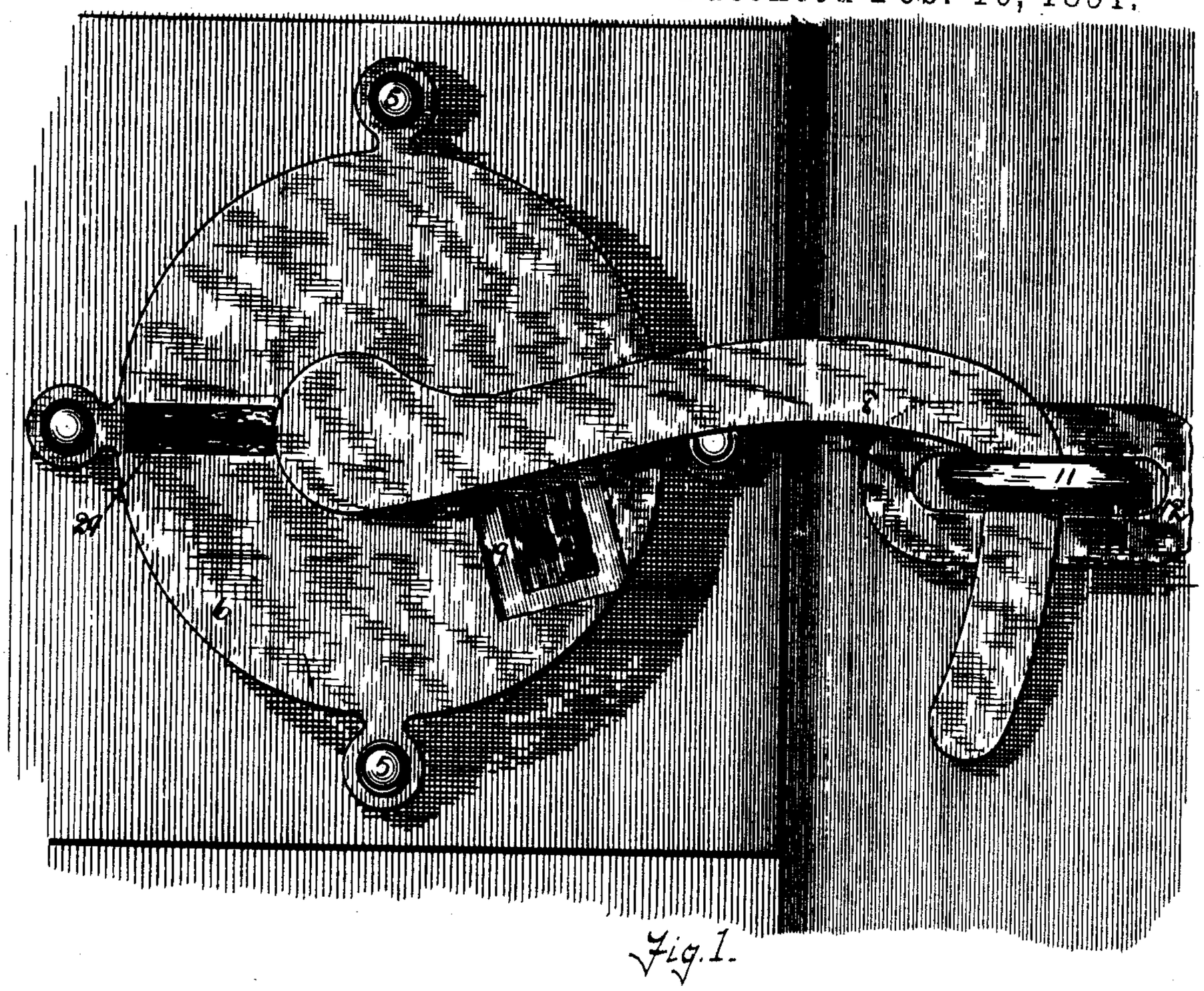


Fig. 1.

Fig. 2.

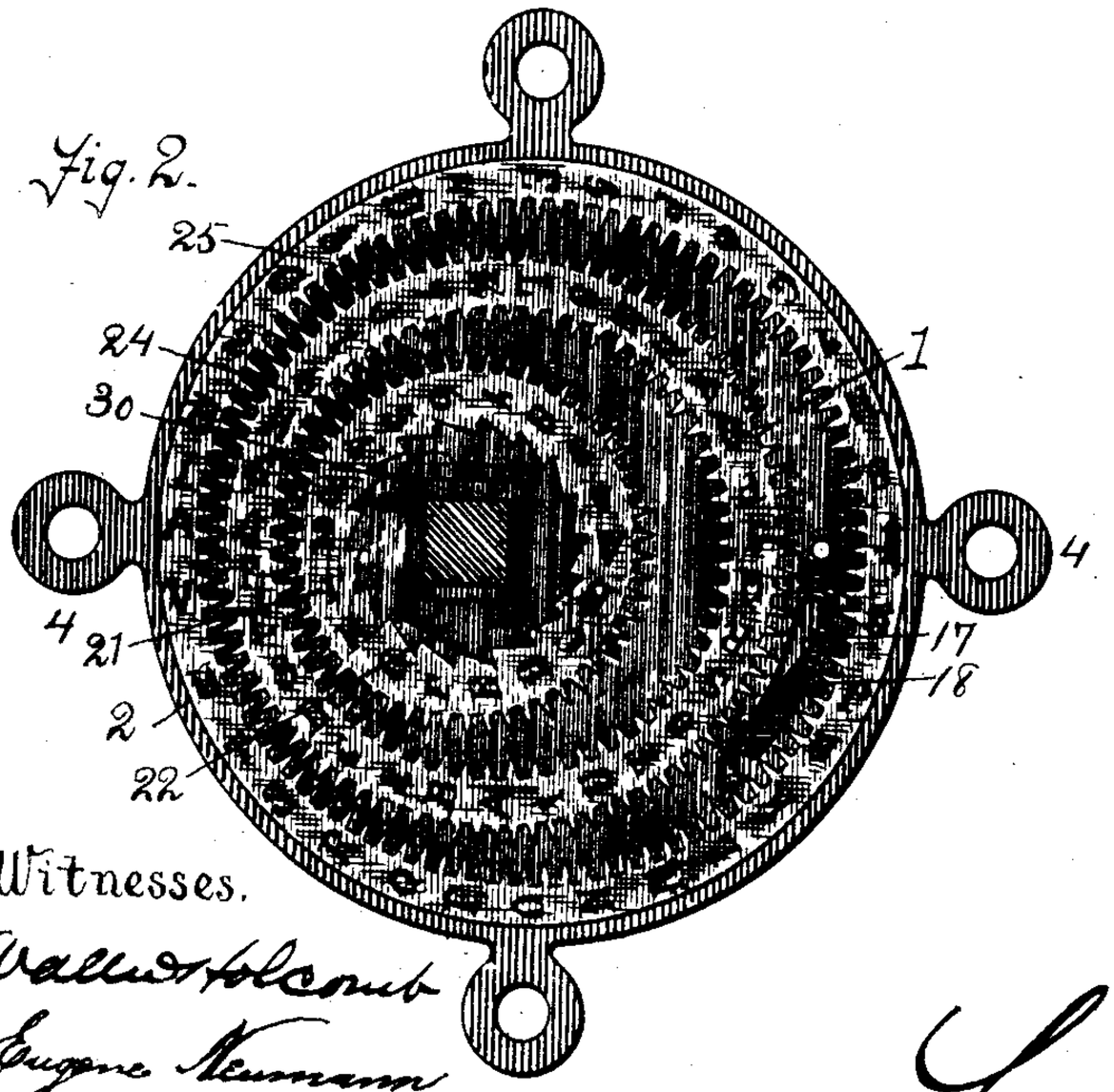
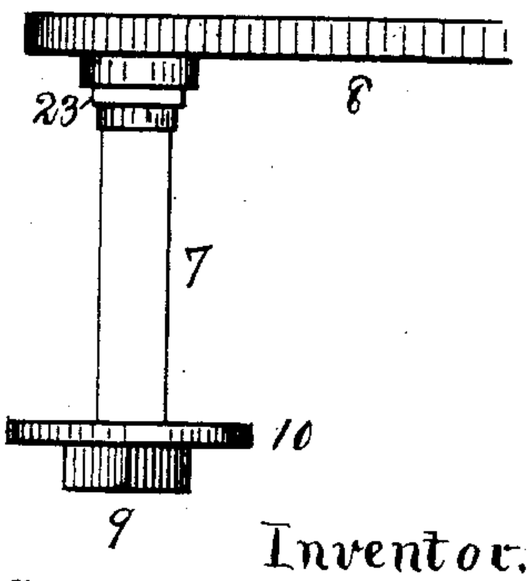


Fig. 3.



Witnesses.

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(No Model.) 2 Sheets—Sheet 2.

G. W. WOOLEY.

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Fig. 4.

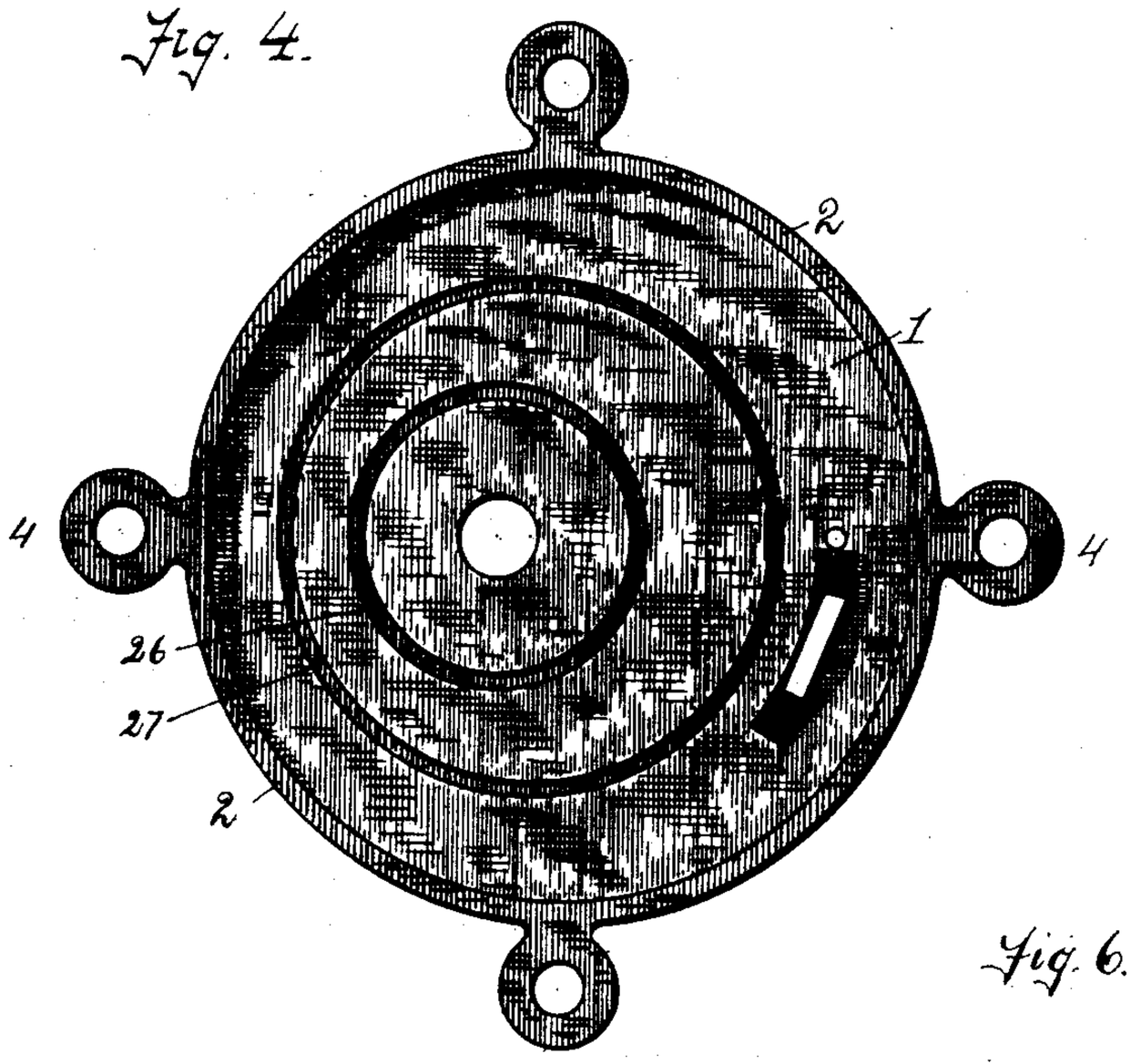
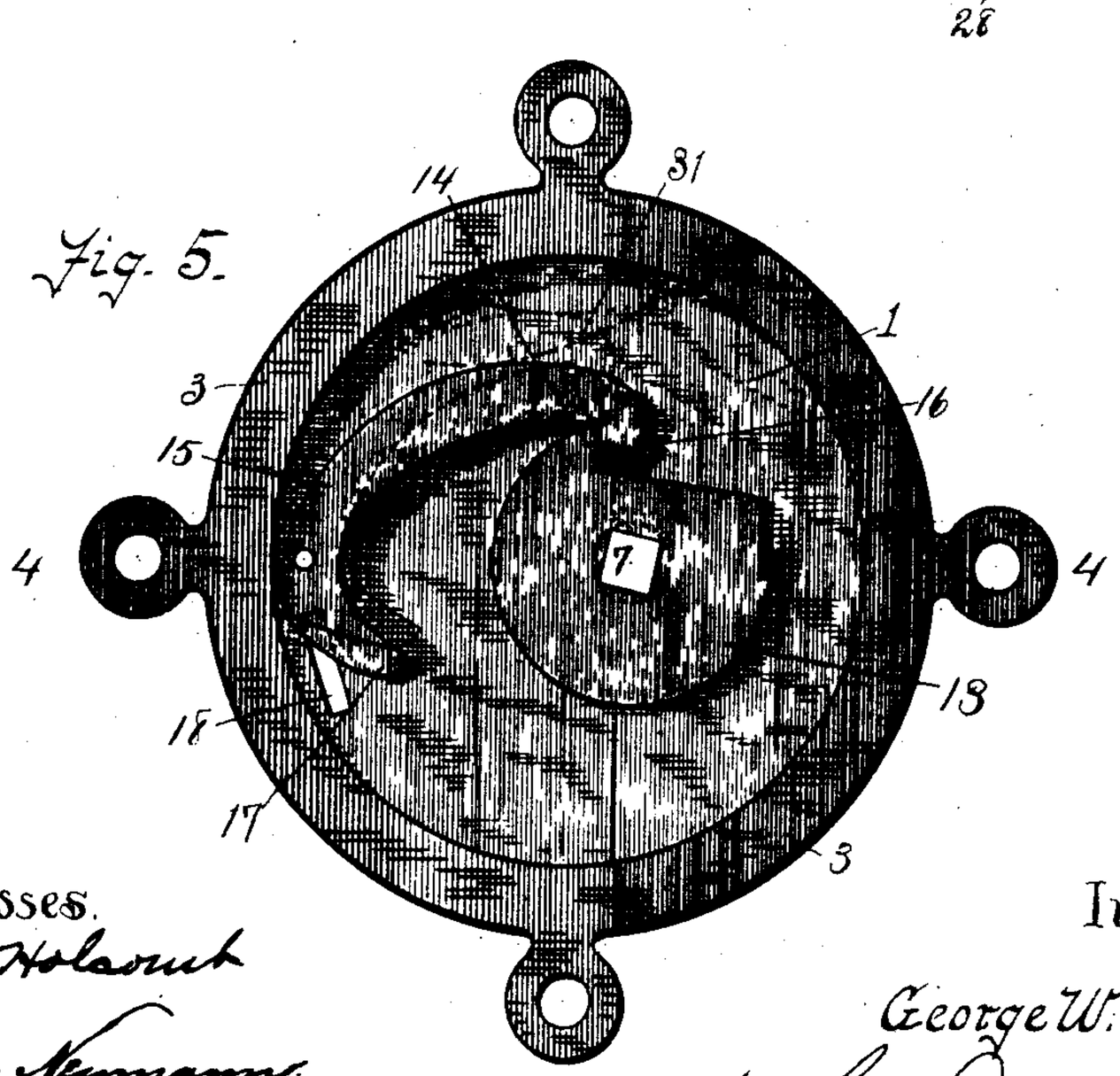


Fig. 6.

Fig. 5.



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UNITED STATES PATENT OFFICE.

GEORGE W. WOOLEY, OF ST. PAUL, MINNESOTA, ASSIGNOR OF ONE-HALF, BY MESNE ASSIGNMENTS, TO JOHN Z. RORABACK, OF KANSAS CITY, MISSOURI.

LOCK.

SPECIFICATION forming part of Letters Patent No. 446,375, dated February 10, 1891.

Application filed April 13, 1889. Renewed January 19, 1891. Serial No. 378,214. (No model.)

To all whom it may concern:

Be it known that I, GEORGE W. WOOLEY, a citizen of the United States, residing at St. Paul, in the county of Ramsey and State of Minnesota, have invented certain new and useful Improvements in Locks; and I do 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, reference being had to the accompanying drawings, and to the figures of reference marked thereon, which form a part of this specification.

This invention relates to improvements in locks of that class whose object is to afford a safeguard rather by indicating any tampering with the same than by preventing access to the object or receptacle guarded except by the use of a special key or the knowledge of a certain combination. It is useful and applicable in any connection wherein it is desired to indicate any tampering with the lock or the article guarded; but its most common application is in the case of freight-car doors as a substitute for the methods of sealing in common use, enabling any tampering with the same to be discovered and the responsibility properly located.

The invention consists in a bolt attached to a spindle passing through the lock-case, the said spindle being adapted to actuate in turning by means of a pawl mounted thereon a series of annular ratchets eccentrically mounted so as to rotate within the case. The ratchets are divided into any desired number of parts, each division being provided with a letter or other character, one of which upon each ratchet is visible through a window in the front of the case, the varying circumference of the ratchets and their eccentric mounting causing a different combination of characters to be brought into line in front of the window with every lifting of the bolt. The case is also provided with a receptacle for a card indicating the sealing-point, and a bolt-locking device is provided within the case in such position that the same cannot be operated to release the bolt except by destroying the card indicating the point of sealing.

The invention is more fully illustrated and described by reference to the accompanying drawings, in which—

Figure 1 represents a front view of the entire lock in position as locked; Fig. 2, a view of the annular ratchets, the outer front plate of the lock being removed and the spindle being shown in position in section; Fig. 3, a side view of the spindle and a portion of the bolt; Fig. 4, a view of the bed upon which the annular ratchets rest, showing the manner in which the same are held in position; Fig. 5, a rear view of the case, the back plate being removed, showing the arrangement and operation of the locking mechanism; and Fig. 6, a sectional detail of one of the annular ratchets.

Like characters designate corresponding parts in all of the figures.

The body of the lock consists of a circular base 1, having annular flanges 2 3 projecting in each direction therefrom and forming the sides of the case. Attached to or constructed as a part of said flanges are suitable ears 4 4, having holes formed therethrough for the reception of screws or rivets 5 5, by means of which the lock is secured to the car or other receptacle. The front of the case is closed by means of a plate 6, having corresponding ears, and a similar plate (not shown) forms the back of the lock, both front and back plates being conveniently held in place by means of the fastening devices 5 5, before mentioned. The interior of the lock is thus divided into two circular compartments separated by the base 1, the front or outer compartment containing the registering mechanism and the inner compartment the locking devices.

A spindle 7, to which the bolt 8 is permanently attached, passes through the several plates forming the case, and preferably through the side of the car to which the lock is attached, where it is secured in place in such a manner as to turn freely by means of a nut and washer 9 10, respectively. (Shown in Fig. 3.) The bolt is in the form of a hook, as shown in Fig. 1, and is adapted to lock the door of the car or other receptacle by entering a staple 11, over which is passed the eye of the hasp 12, attached to the door in the ordinary manner. In unlocking, the hook is raised, thereby turning the spindle.

The locking mechanism for holding the spindle from turning, and thereby preventing the hook from being lifted, is as follows: Upon the spindle, which is of square or angular form, and within the inner compartment of the case is a locking-plate 13, circular for the most part, but having a portion of its upper edge cut away, forming an upright shoulder 14. A tumbler 15, having a hook 16, adapted to engage with said shoulder 14 when the spindle is so turned that the bolt 8 is down, is pivoted to the base 1 within the same compartment. For raising the tumbler out of engagement with said plate 13 the lower end of said tumbler 15 has an arm or projection 17 below the pivotal point and in such a position as to be raised and to lift the hook from engagement with the shoulder 14 by the introduction of a wire or nail or the like through an aperture 18 left for that purpose in the front plate and the base of the lock 1. Upon the front or outside of the face-plate and around said aperture 18 is a pocket or receptacle 19 for a card 20, upon which is designated the station at which or the person by whom the car or other receptacle was locked or sealed. The pocket is so placed that when the card is in place the aperture is covered thereby. The card is inserted through a slit at the top, and the whole is so located with reference to the bolt that when the latter is down, as when locked, it rests upon the top of the pocket, covering the slit, and the locking device previously described retains it in that position. Access can be had to the interior to release the latch only by destroying the card 20.

As a further and more complete means for the purpose of indicating any tampering with the lock I have provided the mechanism shown in detail in Fig. 2. The spindle passes through the lock-case at a little distance to one side of the center, and concentric therewith is mounted an annular ratchet 21, having outer and inner teeth and adapted to be turned by means of a gravity-pawl 22, mounted upon the spindle, which is squared for that purpose, as shown at 23, Fig. 3. The turning of the spindle by the lifting of the bolt causes the pawl to engage with the inner teeth of the ratchet 21, while on the lowering of the bolt the pawl rides over the teeth, rising upon the spindle, as shown in dotted lines in Fig. 2. The outer teeth of the ratchet 21 mesh with the inner teeth of a second annular double ratchet 24, and the outer teeth of the ratchet 24 mesh with a third ratchet 25, the outer circumference of which bears against the inside of the flange 2. The inner, intermediate, and outer ratchets have their radii substantially in the ratio of 2, 3, and 4, respectively, and the center of the intermediate ratchet is half-way between the other two centers, by which arrangement the several ratchets intermesh for a short distance upon one side, leaving the remainder of the circle to move independently. The ratchets are held in position, the outer one by its bearing against the flange 2 and the inner and intermediate ones by means of annular grooves 26 27, adapted to receive an annular rib or flange 28 formed upon the under side of each ratchet, as shown in Fig. 6. There may be any desired number of ratchets arranged in the same manner as the intermediate 24, thereby largely increasing the number of possible combinations indicated by the lock, as will be now set forth.

Upon the face of each of the ratchets is a series of characters, letters, or figures, or both, as shown, there being but one character of the same kind upon the same ratchet. These are properly so arranged with reference to the distance moved over by each ratchet at each lifting of the bolt that the characters upon each ratchet shall be brought into line at some point, for convenience in line with the several centers, and at the point where the ratchets intermesh. Opposite this point in the front plate of the case is provided a window 29 of sufficient size to show the characters as brought into line.

It will be observed from the construction shown in the foregoing that each raising of the bolt through the working of the pawl 22 upon the spindle causes the several ratchets to rotate from right to left, while the lowering of the bolt does not change their position. A different combination of characters is thus brought into line before the window 29 with each raising of the bolt, and the same combination cannot be reproduced until all the combinations are exhausted. The number of combinations is capable of infinite variation, being dependent only upon the relations which the ratchets sustain to each other and the divisions thereupon.

Though this invention has been illustrated and described as a lock for the doors of freight-cars, it is obvious that it may be employed with equal efficiency for any purpose wherein the object to be attained is the detection of and the location of responsibility for any tampering with the same. In slightly-modified form the principle may be applied to locks for mail-bags and the like, and afford a complete check against manipulation by any person into whose hands it may come. In cases where the parts are not liable always to remain in an upright position the pawl and tumbler described herein as gravity-actuated may be given a positive motion in any position by means of springs, as shown in dotted lines at 30 31 in Figs. 2 and 5, respectively.

I claim as my invention—

1. In a safety lock or guard for freight-car doors and the like, the combination of registering mechanism comprising a series of intermeshing annular ratchets eccentrically mounted, a pawl for actuating one of said annular ratchets, and a bolt mounted upon a spindle connected with said pawl for actuating the same by raising said bolt and turning

said spindle, substantially as and for the purpose herein specified.

2. In a safety lock or guard, the combination of registering mechanism consisting of a series of intermeshing annular ratchets having outer and inner teeth and eccentrically mounted one within another by means of an annular flange formed upon the under side thereof and working in a similar annular groove-bearing formed in the base-plate of the lock, a pawl for actuating one of said ratchets, and a hook-bolt mounted upon a spindle connected with said pawl for actuating the same by the lifting of said bolt, substantially as and for the purpose herein specified.

3. In a safety lock or guard for freight-car doors and the like, the combination of registering mechanism consisting of a series of intermeshing annular ratchets eccentrically mounted, a hook-bolt carrying a spindle passing within the inner circumference of one or more of said annular ratchets, and a gravity-actuated pawl mounted upon an angular portion of said spindle and adapted to slide thereon and turn therewith in position to engage with one of said ratchets when said bolt is lifted, substantially as and for the purpose herein specified.

4. In a safety lock or guard for freight-car doors and the like, the combination of registering mechanism consisting of a series of intermeshing annular ratchets eccentrically and rotatively mounted one within another, a hook-bolt attached to a spindle carrying a pawl adapted to actuate one of said ratchets when said bolt is lifted, a notched plate upon said spindle, and a tumbler-latch adapted to engage with the notch in said plate when the bolt is lowered, substantially as and for the purpose herein specified.

5. In a safety lock or guard for freight-car doors and the like, the combination of registering mechanism consisting of a series of numbered or lettered intermeshing annular ratchets eccentrically and rotatively mounted one within another, a hook-bolt mounted upon a spindle carrying a pawl adapted to actuate the inner of said ratchets when said bolt is lifted, a notched plate upon said spindle and turning therewith, a gravity-actuated latch in position to engage with the notch in said plate when the bolt is lowered and prevent the lifting of the same, and a casing inclosing said registering and locking devices and having apertures therein to afford communication therewith, substantially as and for the purpose herein specified.

6. In a safety lock or guard for freight-car doors and the like, the combination of registering mechanism, a hook-bolt mounted upon a spindle carrying a pawl for actuating the registering mechanism, a notched plate mounted upon said spindle, a latch or tumbler pivotally mounted in position to engage with the notch in said plate when the bolt is lowered to prevent the lifting of the same, casing inclosing said registering and locking devices and having an aperture opposite said latch to afford communication therewith for the purpose of lifting the same, and a seal-receptacle surrounding said aperture and having its entrance in position to be closed by said bolt when lowered, whereby access can be had to said latch only by destroying said seal, substantially as set forth.

7. In a safety lock or guard for freight-car doors and the like, a bolt mounted upon a spindle passing through the case of said lock, a notched plate upon said spindle, a latch or tumbler pivotally mounted in position to engage with the notch in said plate when the bolt is lowered to prevent the lifting of the same, a casing inclosing said locking device, affording a bearing for said spindle, and having an aperture therein furnishing communication with said latch for the purpose of releasing the same, and a seal-receptacle surrounding said aperture and having its entrance in position to be closed by said bolt when locked, substantially as and for the purpose herein specified.

8. In a safety lock or guard, the combination, with the bolt, of registering mechanism consisting of a series of numbered or lettered annular ratchets eccentrically mounted one within another, a pawl carried by said bolt in position to engage with one of said ratchets and operate the same with the movement of the bolt in unlocking and to ride over the ratchet without engagement on the reverse movement of the bolt, and a casing inclosing said registering mechanism having an aperture therein in position to disclose one character upon each of the said ratchets as the same are brought before it by the rotary movement of the ratchets, substantially as set forth.

9. In a safety lock or guard, the combination of the bolt, a pawl carried by said bolt, and registering mechanism comprising a series of intermeshing annular ratchets eccentrically mounted one within another in position to be actuated by the engagement with one of said ratchets of the said pawl by the movement of the bolt in the operation of unlocking, each of said ratchets having characters thereupon so spaced with relation to the distance moved over by the respective ratchets at each complete unlocking movement of the bolt that characters upon the several ratchets are brought into line at a predetermined point, substantially as set forth.

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

GEORGE W. WOOLEY.

Witnesses:
S. E. HALL,
F. W. LANE.