

*F. C. Goffin,
Lock and Key.*

N^o 6,165.

Patented Mar. 6, 1849.

Fig. 3.

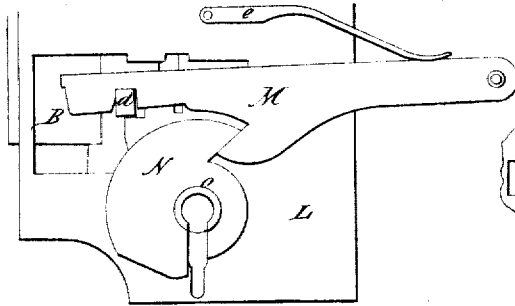


Fig. 10.

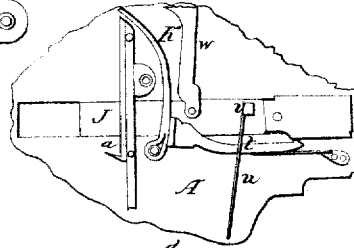


Fig. 1.

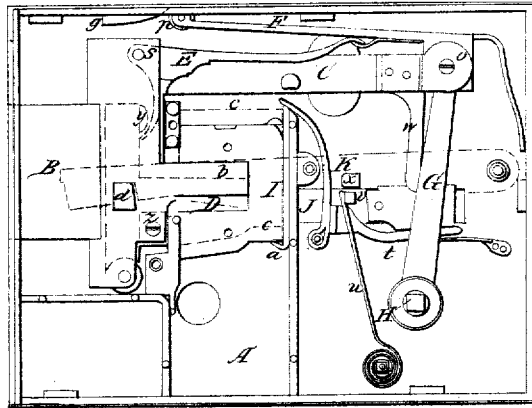


Fig. 9.

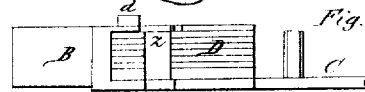


Fig. 8.

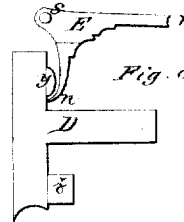


Fig. 7.

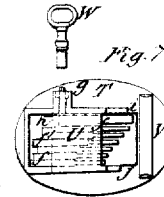


Fig. 2.

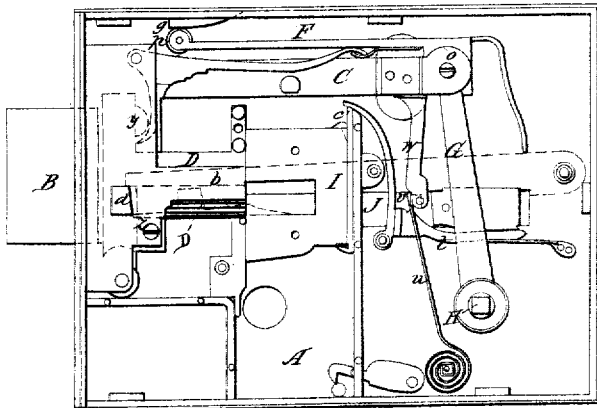


Fig. 5.

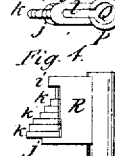
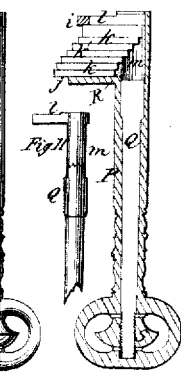


Fig. 4.



Fig. 6.



UNITED STATES PATENT OFFICE.

FRANCIS CHS. GOFFIN, OF PHILADELPHIA, PENNSYLVANIA.

DOOR-LOCK BY A COMBINED KEY AND GAGE, ALSO A THIEF-DETECTOR.

Specification of Letters Patent No. 6,165, dated March 10, 1849.

To all whom it may concern:

Be it known that I, FRANCIS CHARLES GOFFIN, of the city and county of Philadelphia, and State of Pennsylvania, have
5 invented certain new and useful Improvements in Locks and Keys, which I denominate the "Combination Gage-Lock and Sliding-Bits Key"; and I do hereby declare that the following is a full, clear, and
10 exact description of the construction and operation of the same, reference being had to the annexed drawings, making a part of this specification, in which—

Figure 1 represents the interior of the
15 lock, when unlocked; Fig. 2, the same, when locked; Fig. 3, the inner plate covering the works, together with the lever securing the bolt, the key-hole plate, key tube, &c.; Fig. 4, the key; Fig. 5, the ward-end of the key;
20 Fig. 6, a section of the key; Fig. 7, the key-gage; Figs. 8, 9, 10 and 11, details.

The main constituent parts of the lock are: The case (A); the bolt (B); the bolt-shaft (C); the sliding studs (D); the elbow-
25 levers (E); the spring-lever (F); the main-lever (G); the spindle (H) to which the knob is attached; the sliding tumblers (I); the thief-detecting slide (J); the vertical curved lever (K); the plate (L, see Fig. 3);
30 the lever (M) securing the bolt; and the plate (N) covering the key-hole; together with the key-tube (O).

The key consists of the main stem (P) which is hollow; the inner solid stem (Q);
35 the ward (R), and the screw-nut (S).

The key-gage (Fig. 7) consists of the bottom plate (T); the bit-box (U); the guard (V), and the screw-key (W).

The minor parts will be mentioned here-
40 after in proper place, and referred to by letter.

The construction of locks generally being so well understood, and the annexed drawings showing the construction of the one in
45 question so fully and completely in all its ramification, it is deemed superfluous to enter into the details thereof any further than may be required to the well-understanding of the operation of the lock and
50 its appurtenances, a description of which here follows. Before fastening the lock permanently, the bolt is drawn back, and the sliding tumblers (I) are inserted, as shown on Fig. 1, then the plate (L, see Fig. 3) is

laid over it in its proper position, which is
55 pointed out by comparing the corresponding parts in the two figures. Next the lever (M) is placed on the plate, and the key-tube (O) with its key plate (N) is inserted. This done, the outer plate, (not represent-
60 ed), covering the whole, is fastened on, and thus the lock case is closed. Said plate has corresponding holes for the key-tube and the spindle to pass through. The lock having been fastened in its vertical
65 position against the door, the sliding tumblers (I), by their own weight, (or a series of springs,) assume an uniform position, carrying with them the sliding studs (D), and rest (the former) on the flange (a);
70 except the upper (or outer) tumbler, whose position is governed by the permanent stud (b) connected with the bolt, said position being indicated by dotted lines (c) whereas said tumbler is (in the drawing) supposed
75 as being removed. In this position of the bolt, the notch of the lever (M) embraces the stud (d) on said bolt (see Fig. 3), being held down by the spring (e), thus preventing the door being locked without the ap-
80 plication of the proper key, with which by means of the key-plate (N) to raise said lever.

It is optional with the operator, whether to set the key or the key-gage first, so he
85 takes care that both minutely correspond, before the key is used in the lock the first time. The sliding gage-bits (f) being arranged as fancy may dictate, the screw-key (W) is applied to the head of the screw (g)
90 the end of which presses against a plate or washer (h), and thus the bits are held firmly in the desired position. Then the ward (R) of the key is introduced under the guard (V) so as to bring the corresponding sta-
95 tionary bits (i and j) of the gage and the key in close contact with each other. The screw-nut (S) of the key having been previously loosened, the sliding bits (k) are allowed to drop down on the sliding bits (f)
100 of the gage, the said gage and the key being held in a suitable position for that purpose. This accomplished the screw-nut (S) is drawn tight again, the sliding-bits of the key are kept in the desired position, by
105 means of the permanent bit (l) on the solid stem (Q, see Figs. 5, 6 and 11). The said stem is furnished with a slot (m) for the

admission of the bits. The key being thus set for use, the gage is carefully put aside or carried in the pocket.

Having been inserted into the key-tube, the key is turned from the left to the right carrying with it the plate (N) by which means the lever (M) is raised and thus the bolt is disengaged. By further turning the key until the ward is vertically above it, the bits of the key raise the corresponding tumblers and with them the sliding studs. Then the spindle (H) is turned by means of a knob or key, whereby the bolt is pushed forward, carrying with it the sliding studs, at the same time the extreme points (*n*) of the short or vertical arms of the elbow levers (E) are pressed against the sliding studs and keep them in their proper position. This is effected by the spring lever (F), the back extremity of which is hung to the pivot (*o*) connecting the bolt shaft with the main lever, and the front end whereof is furnished with a roller (*p*) which travels on an inclined plane (*q*); thus, when the bolt shaft (C) moves forward, the extremities (*r*) of the longer or horizontal arms of the elbow levers are pressed down, and, the said levers being at the junction of the vertical and horizontal arms plying on a shaft (*s*), the extremities of the vertical arms of the levers must consequently press against the sliding studs. The door being thus locked, the sliding studs remain in the position acquired through the instrumentality of the key. Before withdrawing or turning the key again, and when the ward is turned upward, the screw nut (S) is slightly loosened, when the sliding bits will recede into the ward, and let the tumblers (I) slide down, until they rest again on the flange, as represented in Fig. 2. Then the screw nut is tightened again, the key turned in a reverse direction, and, carrying with it the key plate, the lever (M) is allowed to drop down again into the position indicated by dots on Fig. 2, the extreme end bracing against the stud (*d*). The key is now withdrawn, and may be put with safety into the hands of anybody, even those of a person having previously inspected the key and witnessed the locking operation, without enabling such person to unlock again. He may succeed in setting the key bits so as to nearly resemble their previous position, and flatter himself that it will open the lock, but in vain. Unless the key bits are set to correspond precisely with the sliding studs (which can only be done by means of the gage) and consequently will raise the sliding tumblers precisely to coincide with them the bolt can not be drawn or pushed back. If, for instance, all the bits but one should correspond with the sliding studs, and raise the tumblers precisely to the required height, the remaining one would either raise its tumbler

too high or not high enough, (if it was only the thickness of one hundredth part of an inch or less) the corresponding stud would be prevented from passing and sliding back.

By inspection of the gage (Fig. 7) it will be perceived, that the central bit (*f'*) is somewhat longer than the rest. This is for the purpose of preventing the corresponding bit (*k'*) of the key to project beyond a given distance. It will also be seen (in Figs. 1 and 2), that there is a protuberance (*c'*) on the top of one of the sliding tumblers (being the central one). Now suppose that the key has got into the hands of some ill-disposed person, who would attempt to use the key (for the purpose of robbing or otherwise), although he could not open the lock, his presence and any attempt of tampering with the lock would be discovered. The aforesaid bit (*k'*) of the key would most likely be left projecting beyond the proper distance, and raise the corresponding tumbler higher than it ought to be raised, thereby causing the aforesaid protuberance (*c'*) of said tumbler to strike and push out the extremity of the vertical curved lever (K), in consequence of which the end of the horizontal branch (*t*) thereof relieves the thief-detecting slide (J), which is thrown back by the pressure of the spring (*u*) against the stud (*v*) on said slide. On the face of said slide, toward the interior of the building, room, or box, are engraved the words "O. K." and "Thief;" the former appearing as long as the proper key is used with the lock, but as soon as the lock is tampered with and consequently the slide thrown back, as above described, the latter word appears in its place. The next time of the key being applied (after such an occurrence) for the purpose of locking, the extremity of the elastic arm (*w*) on the bolt-shaft catches the stud (*v*) by means of a protuberance or stud on the underside of the extremity of said arm (*w*), and carries the slide (J) along and leaves it in its original "O K" position; a short inclined plane (*x*) causing the aforesaid stud (*v*) to be relieved of the pressure of the elastic arm (*w*). The different positions of the thief-detecting slide (J) and its appendages are distinctly represented in Figs. 1, 2, and 10.

It may not be out of place to mention, that the sliding studs, tumblers, and elbow-levers, correspond in number, whatever it may be, and that the elongated bit (*f'*) may be the central-one, or otherwise.

Figs. 9 and 10 are inserted, in order to show the manner in which the studs (D) are sliding between the back of the bolt and the studs (*y* and *z*); and Fig. 10 also shows the action of the elbow-lever (E) on the said studs.

It must here be remarked, that the key, constructed as represented, may be used for

any kind of lock, containing tumblers, the number of them being immaterial.

What I claim as my invention, and desire to secure by Letters Patent, is:

5 The thief-detecting-slide in combination with the tumblers and the protuberance, and the springs and levers by which it is operated; and the key gage or register in com-

bination with a key having sliding bits, constructed substantially in the manner, and used for the purposes herein described. 10

FRANCIS CHARLES GOFFIN.

Witnesses:

B. E. HOLLAND,

CHAUNCEY BULKLEY.