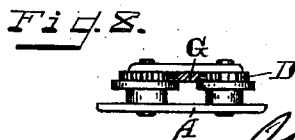
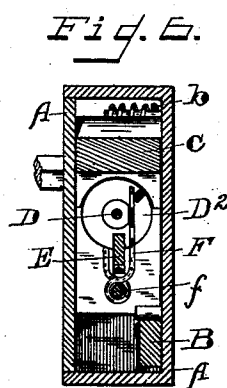
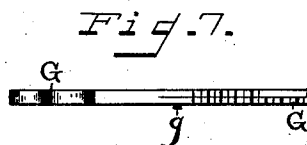
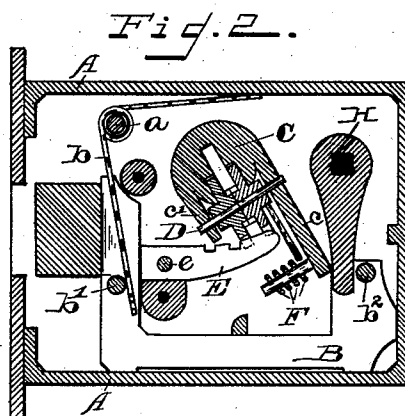


G. H. HYDE.
LATCH AND LOCK COMBINED.

Patented Apr. 12, 1892.



J. H. Warner.
J. A. Walsh.

per *George H. Hyde,* INVENTOR.
Edw. Bradford. ATTORNEYS.

UNITED STATES PATENT OFFICE.

GEORGE H. HYDE, OF INDIANAPOLIS, INDIANA.

LATCH AND LOCK COMBINED.

SPECIFICATION forming part of Letters Patent No. 472,620, dated April 12, 1892.

Application filed January 5, 1892. Serial No. 417,121. (No model.)

To all whom it may concern:

Be it known that I, GEORGE H. HYDE, a citizen of the United States, residing at Indianapolis, in the county of Marion and State of Indiana, have invented certain new and useful Improvements in Locks, of which the following is a specification.

This invention will be first fully described, and then pointed out in the claims.

Referring to the accompanying drawings, which are made a part hereof and on which similar letters of reference indicate similar parts, Figure 1 is a plan view of the interior of the lock, the cap or side thereto being removed; Fig. 2, a sectional view on the dotted line 2 2; Fig. 3, a sectional view looking downwardly from the dotted line 3 3 in Fig. 1; Fig. 4, a transverse vertical sectional view looking toward the right from the dotted line 4 4 in Fig. 1; Fig. 5, a similar view as seen from the dotted line 5 5; Fig. 6, a similar view looking toward the left from the dotted line 6 6; Fig. 7, an edge view of the key to said lock, and Fig. 8 a detail illustration of an alternative construction.

In said drawings the portions marked A represent the casing of the lock; B, the latch or bolt; C, a cylinder carrying the tumblers and other portions of the lock mechanism; D, the tumbler-shaft; E, the tumbler-catch; F, a spring by which the tumblers are held to the locked position; G, the key, and H a thumb-latch attachment by which the lock may be manipulated from the inside without a key.

The casing A is of a substantially ordinary form and construction and contains the various bearings necessary for the mechanism of the lock. So far as it is peculiar it will be described in connection with such mechanism.

The bolt or latch B at its operative point is preferably of substantially the form of ordinary latches. Inside the lock it extends first to one side, then along the edge, and then up to near the center at a point on the opposite side of the mechanism from the operative point, as is best shown in Figs. 1 and 2. A stud *s* on the casing aids in holding it in place therein. It is held to latched position by a spring *b*, which bears against a stud *b'* thereon, and after passing around a stud *a* on the casing presses against the inside of said casing at the other end. It is adapted by the use of

the key to be thrown open by means of the extension *c* on the cylinder C coming against the face of its upwardly-extending part, and a stud *b''*, with which the arm of the thumb-latch attachment comes in contact when said thumb-latch attachment is used, enables it to be operated thereby.

The cylinder C has gudgeon-shaped ends, which rest in suitable bearings in the casing A, as shown most plainly in Fig. 4. Centrally it has a slot for the reception of the key. It has two extensions, one of which *c'* serves only as a bearing for the tumbler-shaft, and the other of which *c* serves both this purpose and to come in contact with and operate the lock bolt or latch. It is limited in its movement by the limit of movement of the bolt or latch, as will be seen by a comparison of Figs. 1 and 2.

The tumbler-shaft D rests in bearings in the projections *c c'* on the cylinder C and carries the tumbler-wheels D' and D². These tumbler-wheels are in the form of gear-wheels, as shown most plainly in Figs. 1 and 4, on their inner or adjacent portions, the central portions being in the form of flanges and the outer portions in the form of hubs, which hubs are each flattened upon one side, as shown in Figs. 3 and 5. Each of the flanges has also a notch, as shown, also, in Figs. 3 and 5, which notches never register except when the key is pushed into the proper point, when they not only register with each other, but are also in registry with the catch E, so that they are permitted to be moved past or over said catch, which then occupies said notches. This will be more fully described in connection with the description of the key.

The tumbler-catch E is a flat plate arranged in front of the tumbler-wheels and having notches into which the flanges of said wheels extend, as shown in Fig. 1. Said wheels are therefore permitted to be revolved at all times when the apparatus is in locked position; but the cylinder and other mechanism are prevented from operating until the wheels are turned, so that the notches in said wheels are brought into line with said catch-plate, when said cylinder may be moved on its axis, and the notches in the flanges of the wheel pass over said plate, as has just been described. When the mechanism is in unlocked posi-

tion, the wheels cannot be turned and the key cannot be withdrawn, so that the key must always remain in the lock until it is locked. The catch-plate E is securely attached to the

5 frame A by a screw *e* or otherwise.

The spring F is mounted upon a stud-shaft *f*, which extends out from the projection *c* on the cylinder, and is in the form of a coil in its center, with two arms extending back past
10 the flattened hubs on the tumbler-wheels D' D². The adjustment of the several parts is such that these spring ends bear upon these flattened portions when the key is withdrawn, said flattened portions reaching the proper
15 position just as the key ceases to operate as it is pulled out. This insures that in this movement the wheels shall always reach exactly the same position, thus insuring that when the key is reinserted it shall engage
20 with exactly the same cogs of the toothed portion that it did at preceding operations of the lock. If no provision of this sort were made, the tumbler-wheels might be accidentally turned the distance of a cog occasionally,
25 which would render the lock inoperative until readjusted.

The key G, as shown most plainly in Figs. 4 and 6, is in the form of a rack-bar, or, rather, two rack-bars joined together, one of which
30 is toothed a greater distance than the other. Upon the side is a small projection *g*. The operation is, when the key is inserted in the lock, that the longer rack first comes in contact with one of the tumbler-wheels and turns
35 it alone a certain distance until the other rack of the key comes in contact with the other tumbler-wheel, when they turn together, as the key is inserted, until said key is stopped by its projection *g* coming in contact with the
40 outer face of the cylinder C. The parts are so adjusted that when this point is reached the tumbler-wheels have been turned so that the notches in their flanges register with each other and also with the tumbler-catch E.
45 The cylinder C is then free to be turned on its axis, which is done by turning the key in the ordinary manner, thus unlocking the lock, as will be readily understood. It will be noticed that this key is subject to an in-
50 finitude of variations, and thus a substantially innumerable number of locks may be made, all of which are different from the others. In making a variation either the
55 stop *g* may be moved slightly or a different number of cogs may be employed or the re-

lation of the two racks constituting the key may be changed, one or the other having a cog more or less, and additional similar tumbler-wheels may be added upon the other side of the key, the key having additional rack
60 edges to correspond, any of which changes will make it impossible to operate any one lock with the key of another. In some locks I may put the two tumbler-wheels on the two
65 sides of the key-opening and have a single rack on each side of the key, as illustrated in Fig. 8, which obviously would be an exactly equivalent and quite as operative construction, but not quite so compact. Such varia-
70 tions of construction and arrangement I regard as fully within the scope of my invention.

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

1. The combination, in a lock, of a cylinder
75 containing toothed tumbler-wheels having notched flanges or rims, a tumbler-catch, and a key having correspondingly-toothed edge or edges whereby the wheels may be turned and the parts brought into registry, substantially
80 as set forth.

2. The combination, in a lock, with rotary tumbler-wheels and hubs on said wheels, having flattened sides, of springs adapted to bear
85 on said hubs and arranged to press upon said flattened sides just at the point when the key is withdrawn from the lock, substantially as and for the purposes set forth.

3. In a lock, the combination of a locking-cylinder, rotary tumbler-wheels mounted on
90 a shaft in said cylinder, which wheels are provided with flanges having notches, a tumbler-catch having notches in which the outer portions of said tumbler-wheels may revolve, a key-opening in said cylinder alongside said
95 tumbler-wheels, and a key adapted to rotate said tumbler-wheels, substantially as set forth.

4. The combination, with a lock, of a key consisting of two racks, one of which is toothed
100 for a greater portion of its length than the other, substantially as and for the purposes set forth.

In witness whereof I have hereunto set my hand and seal, at Indianapolis, Indiana, this 22d day of December, A. D. 1891.

GEORGE H. HYDE. [L. s.]

Witnesses:

CHESTER BRADFORD,
J. A. WALSH.