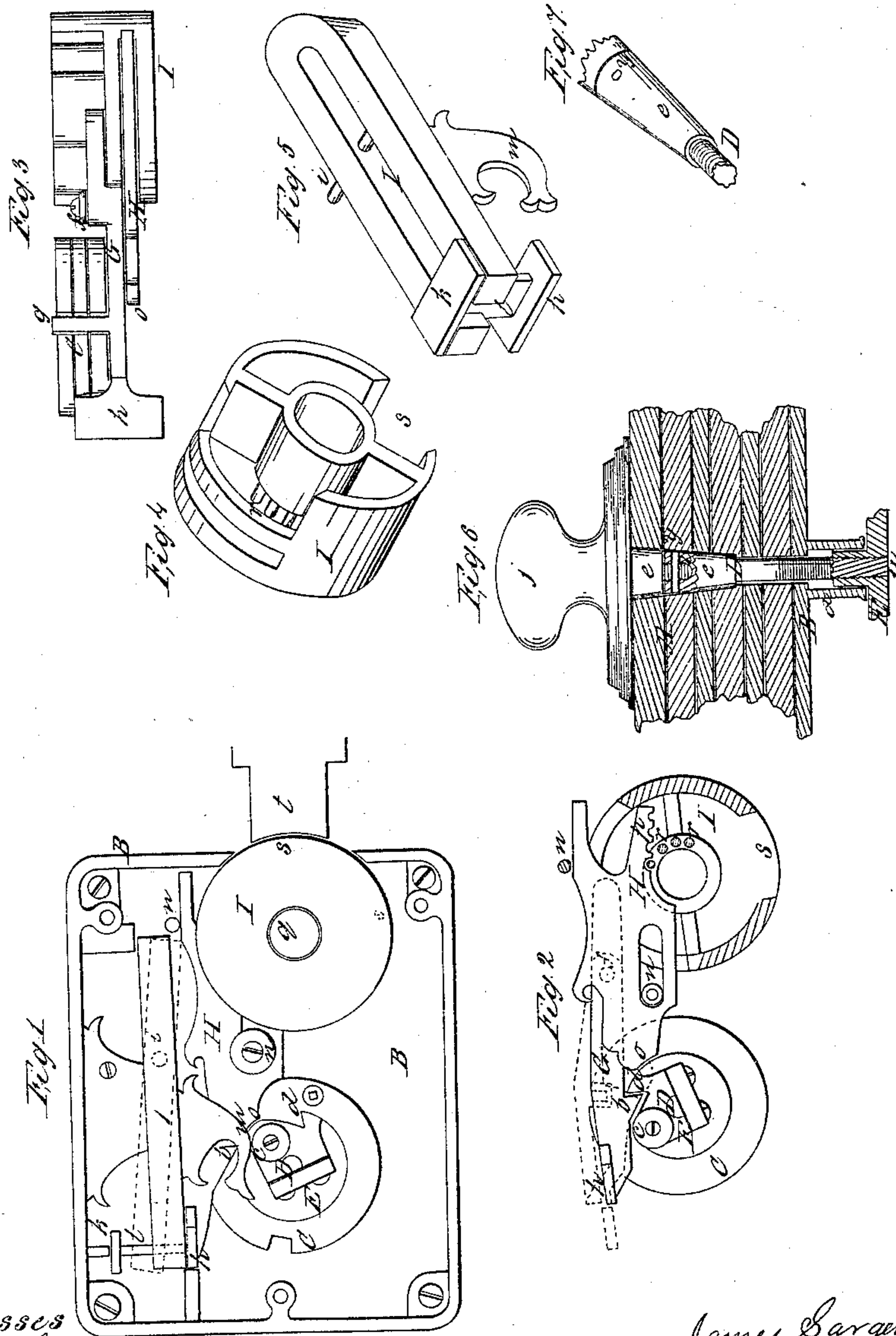


J. Sargent,
Permutation Lock.

N^o 57,574.

Patented Aug. 28, 1866.



Witnesses
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UNITED STATES PATENT OFFICE.

JAMES SARGENT, OF ROCHESTER, NEW YORK.

IMPROVEMENT IN LOCKS.

Specification forming part of Letters Patent No. 57,574, dated August 28, 1866.

To all whom it may concern:

Be it known that I, JAMES SARGENT, of Rochester, in the county of Monroe and State of New York, have invented certain new and useful Improvements in Combination Locks; and I do hereby declare that the following is a full and exact description thereof, reference being had to the accompanying drawings, making part of this specification.

Figure 1 is an elevation of my improved lock with the back plate removed to show the interior arrangement; Fig. 2, an elevation of the circular tumbler, the sliding cog-bar, the pivoted lever, and the cam and combination wheels removed from the case; Fig. 3, a plan of the parts shown in Fig. 2; Fig. 4, a perspective view of the circular revolving tumbler, looking from the inside; Fig. 5, perspective view of the magnet and its armatures; Fig. 6, a view showing the manner of applying and connecting the operating-shaft to the plating of a bank-safe door; Fig. 7, perspective view of the conical or wedging portion of the operating-shaft.

Like letters of reference indicate corresponding parts in all the figures.

In general principles this lock is constructed upon a plan similar to those patented to James Sargent and H. W. Covert, May 2, 1865, and January 9, 1866. A magnet is employed, as in the first patent, and the construction of the combination-wheels and operating-cam is the same as in the last patent named.

My present improvements have relation more particularly to the construction of the tumbler, the method of operating it, its relative connection and arrangement with the stem or operating projection of the large bolt of a bank-safe door, and the arrangement of the operating-shaft of the lock in the plating.

As represented in the drawings, A indicates the plating of a bank-safe door, and B the case of the lock secured thereto. At a suitable position within the casing rest a series of combination-wheels, C C C, upon a hollow stud, *a*, Fig. 6, through which passes the shaft D, that connects on the inside with the cam-disk E.

The combination-wheels are of the same construction as in the before-named patent of January 9, 1866, each wheel being composed

of a rim and center, that admit of the combination being changed, as in ordinary locks of this kind. The center is fixed in place by an arrangement of brakes and a cam and spring within, that clamp and hold it, being operated from the outside by a suitable key.

The cam-disk E, secured to the operating-shaft, is for the purpose of raising and allowing the projection *b* of the pivoted lever G (presently to be described) to ride thereon, to keep the dog from the edges of the combination-wheels. It has a crank roller or cam, *c*, for raising the magnet (when depressed) and a bit, *d*, for throwing the bolt forward or backward. The construction and arrangement of these parts are the same as in the patent above referred to.

The lever G is substantially of the form shown in Figs. 2 and 3. It is pivoted at *f* to a cog-bar, H, connecting with the tumbler, and is provided with the usual dog *g*, for engaging with the notches of the combination-wheels, and with an armature, *h*, of soft iron at the rear. Above this armature is suspended, on a pivot, *i*, a magnet, L, and above this a second armature, *k*, having a pendant, *l*, of brass. The action of the magnet is similar to that described in the first-named patent of 1865, being such that when in contact with the lower armature, *h*, as shown in black lines, Fig. 1, the dog *g* will be held away from the combination-wheels, but when raised and brought in contact with the upper armature, *k*, as in red lines, the dog is allowed to fall into the notches.

The magnet is raised by means of the roller *c* striking a cam-projection, *m*, attached on its under side.

The pendant *l* is for the purpose of keeping the armatures separated properly.

The cog-bar H is substantially of the form represented in Figs. 2 and 3, being simply a plain bar, to which the lever G is pivoted, and sliding forward and backward on suitable guides *n n*, which hold it in place. This bar is operated by the bit *d*, which strikes between its rear end, *o*, and the projection *b* of the pivoted lever. At the front end the bar is provided with a number of cogs or teeth, *p*, for operating the tumbler, as will presently be described.

I employ a circular or segmental tumbler, I, which rests upon a stud or bearing, *q*, around which it turns by the action of the cog-bar. I prefer to make this tumbler of the skeleton form indicated in Fig. 4; but, if desired, it may be made solid. At a suitable position it is provided with a circular cog-gear, *r*, which meshes with *p* of the cog-bar, by which means the tumbler is turned, and also with a socket or opening, *s*, of such size that when turned to the proper outward position it allows the stem or projection *t* of the heavy bolt of the safe-door to fall therein, and thus unlock the said bolt. It is obvious that the same effect would be produced by clipping or squaring one side of the circular tumbler to allow *t* to retract.

The operation of the before-named parts is so obvious as not to need description.

The novelty of the arrangement described consists, principally, in the use of the circular revolving tumbler I in connection with the mechanism of the lock. The principal advantage of this tumbler consists in its isolation, so to speak, from the combination-wheels and the main working parts. It rests alone on its bearing *q*, the only part connected being the cog-bar H. In ordinary locks the sliding bolt extends back in direct connection with the main working mechanism, and by its constant action and the strain that comes upon it frequently disarranges those parts. This is especially true when the stem or projection *t* of the heavy bolt of the safe-door rests against the sliding bolt. In this case, when force is applied to the bolt, the wrenching strain upon the bolt and mechanism is very great. In my lock it will be seen that this difficulty is obviated, for any strain that comes upon the circular tumbler, either from the stem *t* or any other source, is simply expended upon the strong bearing *q*, and does not reach back to the combination-wheels or any part of the working mechanism. This is of the utmost importance.

It will be seen that the strength of the lock is thereby greatly increased, and there is less danger of its forcibly being broken open, especially since the stem of the heavy bolt comes on a line with the bearing *q*. This ar-

range also increases the difficulties of lock-picks and burglars in opening the lock. Where the simple sliding bolt is employed they are enabled to come in contact with the operating parts by means of the bolt. In this device they operate only on the bearing *q*.

The inner end of the operating-shaft D, resting in the plating, connects with the cam-disk E by means of screw-threads *u*, Fig. 6, while at the outer end is a knob, *j*. The outer portion is made of conical or wedging shape, as shown at *e*. In this conical portion, at a suitable distance within the plating, the shaft is divided into two parts by means of a screw, *v*, of the knob portion screwing into the shank portion, and having a small pin, *y*, passing through to hold them. Thus, if great drawing strain should be applied to the knob, the two parts of the shaft would be drawn asunder at the joint *v*, instead of drawn out at *u*, and there would be no means of getting a firm hold again on the portion remaining; nor could the remaining portion be driven in, owing to its conical or wedging form; nor could gunpowder be introduced. Therefore, this device is a safeguard against robbers.

This same arrangement of shaft may also be applied to the heavy bolt of safe doors with the same effect.

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

1. The rotating tumbler I, when separated and isolated in action from the permutation-wheels, and so arranged that any inward pressure upon the bolt will be exerted on the bearing of said tumbler and have no action nor effect upon the said permutation-wheels, substantially as and for the purpose herein specified.

2. In combination with the turning tumbler I, the cog-bar H and lever G, arranged and operating as herein set forth.

3. The combination and arrangement of the combination-wheels C, cam-disk E, pivoted lever G, cog-bar H, and turning tumbler I, the whole operating as herein specified.

JAMES SARGENT.

Witnesses:

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H. W. COVERT.