

UNITED STATES PATENT OFFICE.

SOLOMON ANDREWS, OF PERTH AMBOY, NEW JERSEY.

COMBINATION DOOR-LOCK.

Specification of Letters Patent No. 2,276, dated September 30, 1841.

To all whom it may concern:

Be it known that I, SOLOMON ANDREWS, of Perth Amboy, in the county of Middlesex and State of New Jersey, have made a new and useful improvement in locks for doors, safes, &c., which improvement is particularly applicable to, and is an important improvement on, the combination-lock for which Letters Patent of the United States were granted to me, dated on the 11th day of January, in the year 1836, but which improvement may be applied also to locks of other constructions; and I do hereby declare that the following is a full and exact description thereof.

My improvement consists in combining with the horizontal tumblers, upon which the bits of the key have, heretofore, been made to operate, and upon which they operated in my combination lock, a corresponding number of upright, or vertical, tumblers, which are to be lifted by the key, and which bear against, and lift, the horizontal tumblers; and also in giving to the said upright, or vertical, tumblers a peculiar form which I denominate the double belly, by which peculiarity in their form the key is made to act upon said upright tumblers, and through them upon the horizontal tumblers, in a manner which renders the operation of the lock much more certain and accurate than without such provision.

In the accompanying drawing, the interior of the lock is shown, the face, or cap plate, having been removed for that purpose.

The horizontal tumblers A, A, which are immediately connected with the lock-bolt B, are made, and operate, substantially in the manner of those used by me in my lock patented on the 11th of January 1836; but instead of being lifted by the bits of the key, as in that lock, the horizontal tumblers are to be lifted by the upright, or vertical, tumblers C, of which there is a series equal in number to that of the horizontal tumblers, and which act upon the lower edges of the tumblers A. These latter tumblers in the original lock were straight on their lower edges, and said edges were all coincident, or in the same line, when not raised by the key; they are, under the present arrangement, curved, or formed with an obtuse angle, as shown at A', to adapt them to their being lifted by, and operating against, the upper edges of the upright tumblers C. The upper tumbler in the series C, is repre-

sented as straight on its upper edge, but that immediately below it has not its upper edge in a line with it, but is made to project above it, as shown by the dotted lines *a, a*, and the lower edge of the tumbler against which it acts is cut away, and so formed as to correspond with the tumbler by which it is to be lifted, as shown by the dotted lines *b, b*. The object of this device is to prevent the possibility of one of the upright tumblers acting upon a horizontal tumbler upon which it ought not to act, which might otherwise result from a slight deviation in either of the series; that is to say, each successive pair is made to break joints with those pairs in their immediate vicinity.

Although in my improved lock herein described, I do not make the lower edges of the horizontal tumblers to coincide with each other, so as when down, and not acted upon by the key, to be all in one line, or plane, I yet preserve the same principle of action by making the upright, or vertical, tumblers C, when not lifted by the key, to coincide with each other in the hollow, or belly part, D, D, upon which the bits of the key are to operate, so that with a key having a single bit, in the ordinary form, said tumblers would be all lifted to the same height. Upright tumblers having the bits of the key operating within them, in what is called the belly part, have been used; but I form these tumblers with what I call a double belly, or double concavity, there being a smaller concavity, hollow, or belly, E, at the upper portion or part of each large hollow, or belly, in each of these tumblers. The design of this second belly, or hollow, is to suspend the lifting action of the respective bits which operate upon the tumblers, during the time in which the bolt-bit is acting upon the bolt to shoot it out, or to withdraw it in unlocking; while, as formerly constructed, the horizontal tumblers were kept in motion, either rising or falling, during the time of the moving of the bolt, and hence it became necessary to make provision for this continuous upward, or downward, motion of the tumblers by cutting away, or giving an inclination to, the side of the bolt stump F, in order to admit of its passing through the openings in the fore ends of the horizontal tumblers, or otherwise to give such form to said openings as would produce a like result. By entering the second belly E, which takes place at the instant the tumblers are lifted

to the proper height for the bolt stump to enter the openings in the tumblers, the action of the bits of the key is suspended, and so continues until the motion of the bolt has
5 ceased, the horizontal tumblers resting upon the upper side of the bolt stump, during that period. The bolt stump may, consequently, be made square, or nearly so, and may have its upper and lower edges in close contact
10 with the openings in the tumblers during its whole passage.

Having thus fully described the nature of my improvement, and set forth the manner in which the same operates, what I claim therein, and desire to secure by Letters Patent, is—

1. The combining of the upright, or vertical tumblers C, with the horizontal tumblers, A, A, in such manner as that the latter shall
20 be lifted by the former, instead of by the bits of the key; the said upright tumblers C, being so formed as to have their inferior curves, or belly, to coincide with each other

in the manner set forth, when not acted upon by the bits of the key; or in any other
25 manner which is substantially the same in combination and action, and which will give a false impression as regards the various lengths of the several key bits which act upon them when this is attempted to be
30 ascertained through the key hole.

2. I claim the forming of the second belly, or concavity, E, in each of the upright tumblers, and in any form of tumbler; said concavity being so situated as to receive the
35 respective bits of the key at the instant the bolt stump is to enter the openings in the ends of the tumblers, and thus suspending the action of said bits during the time of the moving of the bolt; in the manner set
40 forth.

SOLOMON ANDREWS.

Witnesses:

JOEL JOHNSON,
CHAS. ELDRIDGE.