S. Andrews,

Door Lock.

No. 1,977. Patented Feb. 12, 1841.

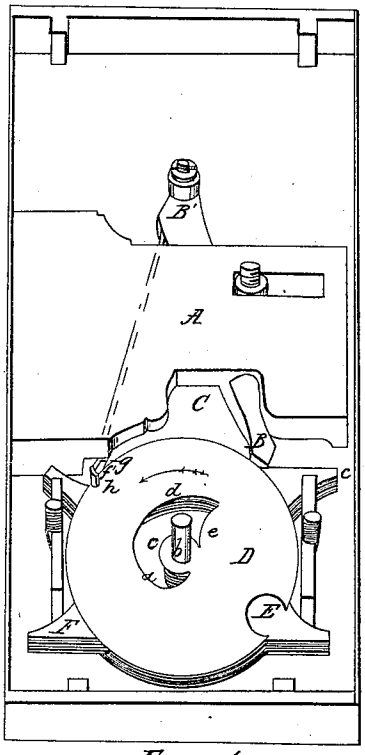


Fig. 1.

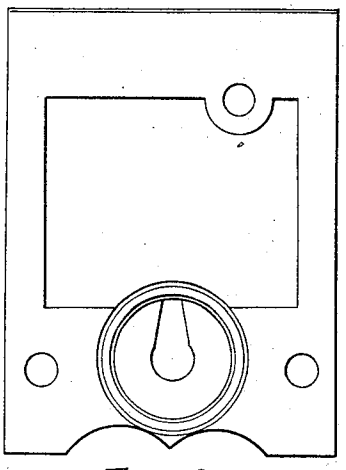


Fig. 2.

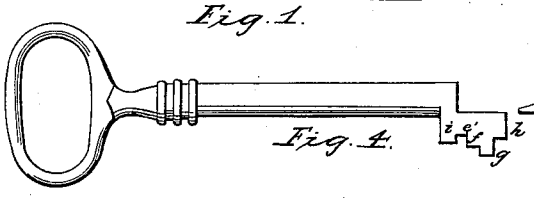


Fig. 4.

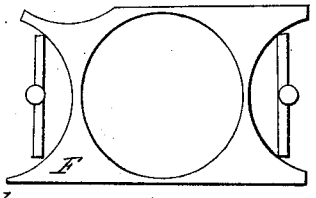
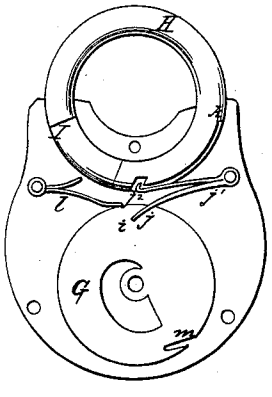


Fig. 5.



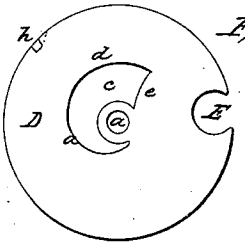


Fig. 3.

UNITED STATES PATENT OFFICE.

SOLOMON ANDREWS, OF PERTH AMBOY, NEW JERSEY.

MANNER OF CONSTRUCTING DOOR AND OTHER LOCKS.

Specification of Letters Patent No. 1,977, dated February 12, 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 invented a new and useful improvement in the manner of constructing door and other locks, said improvement being applicable to every kind of lock which is intended to be opened by a key; and I do hereby declare that the following is a full and exact description thereof.

I denominate this lock "the combined snail-wheel lock," which name is given to it on account of one of its principal characteristics being the causing of the key to carry around with it any desired number of wheels formed of flat plates of metal, which wheels revolve upon a center pin, and are each of them perforated with a snail-like, or other suitably formed opening, within and upon which the bit of the key is to act, in a manner to be presently described.

In the accompanying drawing, Figure 1, is a representation of a door lock, with the cap plate, Fig. 2, removed, for the purpose of exhibiting the interior.

A, is the bolt, which is not to be acted upon directly by the key, but by a pendulous lever B, which works on a joint pin at B′, said pin being its fulcrum. The end B, of this lever, which is made thicker than the part of it under the bolt, is received within the space, or notch, C, in the bolt, which it serves to carry back and forth.

D, is one of the snail wheels; of which, in the lock from which this drawing was made, there are four. One of these is represented separately in Fig. 3; in this wheel *a*, is a center hole, which passes over the drill pin *b*, of the lock; *c*, is a snail-like eccentric, or other suitably formed perforation, which may be alike, or they may differ in each of the wheels. The bit of the key is to operate on the curve *d*, *d*, of this perforation, and it will be manifest that the point upon which it will act will be determined by the length of that part of the bit which is brought into contact with said eccentric curve.

Fig. 4, shows the kind of key employed, *e′*, *f*, *g*, and *h*, being four portions of the bit varying in length from each other, and intended to act upon the curves *d*, *d*, of the wheels. The part *i*, serves to connect the bit with the barrel, and there is a recess in the bush of the cap plate to allow this part to turn in; without which provision the bit would be cut off. The respective acting parts of the bit, *e′*, *f*, *g*, *h*, may be of any length within the compass of the snail-like perforation, their lengths being governed by accident, or fancy.

In order to move the bolt forward by the action of the key, the end B, of the pendulous lever must be received into recesses E, which are formed on each of the snail wheels; and it will be evident that this cannot take place unless the similar recesses in each of the wheels are made to coincide; to effect this, these recesses are not made until the key is finished, and allowed to act by the projecting portions of its bit upon the respective wheels by turning it around so as to carry them in the direction of the arrow, which is that for locking, or shooting the bolt out, and in doing this the wheels will be carried to different distances until the last, and least projecting part of the bit is brought into contact with its corresponding wheel. The recess E, is then made through all the wheels while they are confined in this position, and the key, therefore, when again turned to shoot the bolt, will always cause them to coincide; and as the wheels are carried around, the end of the pendulous lever B, will fall into them, and it will be carried forward, and with it the bolt A. The key is not allowed to turn any farther than is necessary for shooting the bolt, and allowing the end B, of the lever to escape from the recesses E, there being a stop pin, or projection, on the under side of the bush of the cap plate with which pin, or stop, the part *i*, of the bit comes into contact, and is thereby arrested; in order to remove the key, it must be turned back to its original position. When the bolt is to be withdrawn, the key is to be turned as in locking, until the piece B, falls into the recesses E, and then on reversing the motion of the key, the bolt will be carried back, or withdrawn, by the action of the lever. The flat side of the bit of the key coming into contact with the ends *e*, of the snail-like perforations, causes the snail-like openings in them all to coincide as they are turned back for the purpose of removing the key. When the wheels are brought into the proper position for withdrawing the key, the lip, or tongue, *f′*, which constitutes the end of a spring *g*, *g*, falls into notches *h*, on the edges of the wheels, and holds them in place until they are again acted upon by

the key. This lip may be lifted from the notches by the action of the wheel which is first moved by the key, the notch *h*, in this wheel being beveled off, in the manner shown by the dotted line Fig. 3. The spring *g*, *g*, represented by dotted lines, is shown as attached to the fulcrum end of the lever B; this spring is chiefly intended to cause the end B, of the lever to enter the recesses E, as soon as they are brought opposite to it. Sometimes I allow a pin upon the lever B, to enter a slot, or mortise, made through the bolt, for the purpose of moving it back and forth; this part, however, may be arranged in various ways. Between each of the wheels there is interposed a stationary plate F, Figs. 1, and 5, by which they are rendered independent of each other in their action.

In Fig. 6, I have represented my snail wheels as combined in a padlock, the hasp, or shackle, of which is a revolving ring; but they may be combined with a hasp, or shackle, of the ordinary kind. The snail wheels G, are similar to those already described, and are to be separated from each other by a plate, or by small washers. H, is the hasp, or shackle, consisting of a hoop, or ring, with a piece cut out at I. This hoop revolves in a groove in the lock, made to receive it, and is represented as when the lock is closed; when unlocked, the ring is to be turned around by hand so as to allow the staple to escape at the opening I. The notch *i*, on the periphery of the snail wheels performs the office of the end of the lever B, in the lock first described; and when the key comes to its bearing on the respective snail perforations, the notches in each wheel similar to *i*, coincide; and in consequence of this when the plates are turned around to a sufficient distance, the end *j*, of the spring catch *j'*, enters these notches, and the catch j^2, is thereby withdrawn from the notch in the ring H, within which it is represented as being contained; and the ring can then be turned around until the catch j^2, arrests it by coming into contact with the offset *k*, in the ring, which brings the opening I, without the body of the lock. The spring *l*, performs the office of that marked *g*, *g*, in the door lock, its lower end entering notches *m*, in the snail plates when they are turned back, and thus arresting and holding them in the proper place. While the plates are revolving, this spring bears upon their edges, and keeps them from any accidental or irregular motion. When the plates, or wheels, are turned back, and the key removed, the hoop H, may be turned around, and the catch j^2, will fall into its notch, as shown in the drawing.

I have sometimes used a device by means of which the hoop H, is made to revolve by the action of the key, but this, of course, renders the action somewhat more complex. I have also variously arranged the springs, catches, and other auxiliary parts; a thing which can readily be done by any clever workman, without varying the general principle upon which said lock operates. I do not intend, therefore, by anything contained in the foregoing description to limit myself to the precise manner which I have exhibited, of arranging these parts, but to vary them as I may think proper, while I attain the same end by analogous means.

Having thus, fully set forth the nature of my improvements in my combination snail-wheel lock, and shown the manner in which the same are carried into operation, what I claim therein as new, and desire to secure by Letters Patent, are—

The use and employment of said combined wheels, having in them openings similar to those herein described, which wheels are to be operated upon within the snail formed, or other openings, and carried around to different distances by projecting pieces on the bit of the key, until a notch, or cavity, on the periphery of each wheel is brought to coincide with those on the other wheels with which it is combined, so as to admit of the opening of the lock, in the manner, or upon the principle, above set forth.

I will here remark that such is the action of this lock, that there is not any friction or wearing of the key, or of the parts of the wheels with which it is brought into contact, as its office is merely to carry the wheels around.

SOLOMON ANDREWS.

Witnesses:
THOS. P. JONES,
W. THOMPSON.