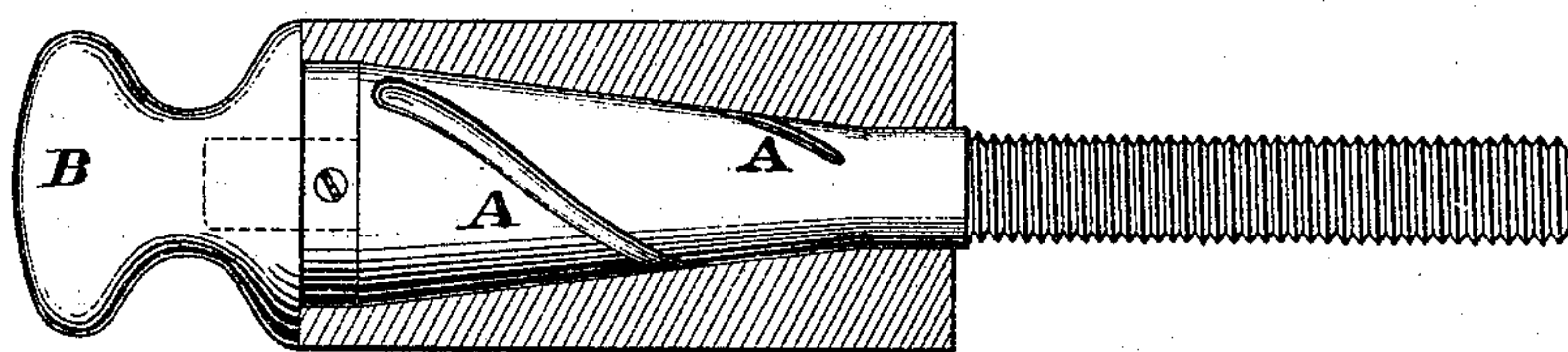


R. Haile,

Permutation Lock.

No. 104,020.

Patented June 7, 1870.



ATTEST,
J. C. King Jr.
James Moore

INVENTOR,
Robert Haile

United States Patent Office.

ROBERT HAILE, OF CINCINNATI, OHIO, ASSIGNOR TO CHARLES DIEBOLD
AND JACOB KIENZLE, OF SAME PLACE.

Letters Patent No. 104,020, dated June 7, 1870.

IMPROVEMENT IN SPINDLES FOR SAFE-LOCKS.

The Schedule referred to in these Letters Patent and making part of the same.

To all whom it may concern:

Be it known that I, ROBERT HAILE, of Cincinnati, in the county of Hamilton and State of Ohio, have invented a certain new and useful Improvement in Spindles for Safe-Locks; and I do hereby declare that the following is a full, clear, and exact description of the construction and operation of the same, reference being had to the annexed drawing making part of this specification.

The object of my improvement is to provide against certain defects, familiar to those skilled in the art, in the construction of spindles for safe-doors, intended to be burglar-proof.

The objects usually attempted to be attained in such spindles are—

First, a spindle that cannot be withdrawn after the knob may have been broken off.

Second, a spindle that cannot be driven into or through the safe-door.

Third, a spindle so constructed that it will, while being struck with the sledge, remain firm in its place, and thereby prevent a rebound of the spindle.

Among other forms of spindles that have been used to obviate these defects are a spindle having one or more shoulders, which brace against appropriate projections in the door or back to prevent being driven in, a plain tapering spindle, and a spindle combining the features of the above two forms, that is, tapering in form from the outside to the inside, and having a series of small shoulders at intervals.

The great disadvantage of the plain tapering form is that it may be driven entirely through the safe-door.

This disadvantage was intended to be remedied by the use of shoulders on the spindle, as above described, but while their use in the case referred to may obviate this inconvenience, they give no protection whatever against the spindles being withdrawn from the front.

The spindle which embodies my invention, and a

perspective of which is shown in the annexed drawing, it is believed will remedy all these defects.

It is tapering in form, and has one or more spiral grooves, A, cut upon its tapering surface. The grooves A have cutting-edges all along their surfaces.

When the spindle is struck with a sledge or hammer, after the knob is broken off, the tendency of the taper form would be to act like a wedge, and burst, or otherwise find an entrance through the plates with which it is in contact. But, immediately upon its progression forward, in obedience to such blows, the cutting-edges of the spiral grooves will engage with the iron or other soft metal-plates for that purpose surrounding it, until they become imbedded or fixed rigidly in the plates, and while continued blows from the sledge will have no tendency to cause a rebound, but will, on the contrary, tend to make the spindle progress still further in, yet, from the form of the grooves, and the impossibility of turning the spindle from the outside, it will be found impossible to drive the spindle wholly through the surrounding plates.

The drilling above referred to cannot be done without first fixing or making the spindle fast by striking it with a sledge, but such striking on the spindle, herein specified, will bind it so firmly, as before described, that it cannot afterward be withdrawn in manner above described.

I am aware that cutting-edges have been formed on the annular shoulders of spindles, and therefore I do not claim such; but

Having thus described my invention,

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

A tapering spindle, having one or more spiral grooves with cutting-edges, substantially as and for the purpose set forth.

ROBERT HAILE.

Witnesses:

JAMES MOORE,
S. S. MORRIS.