

W. Hall,

2 Sheets-Sheet 4.

Permutation Lock.

N^o 47,817.

Patented May 23, 1865.

Fig. 5.

Fig 6

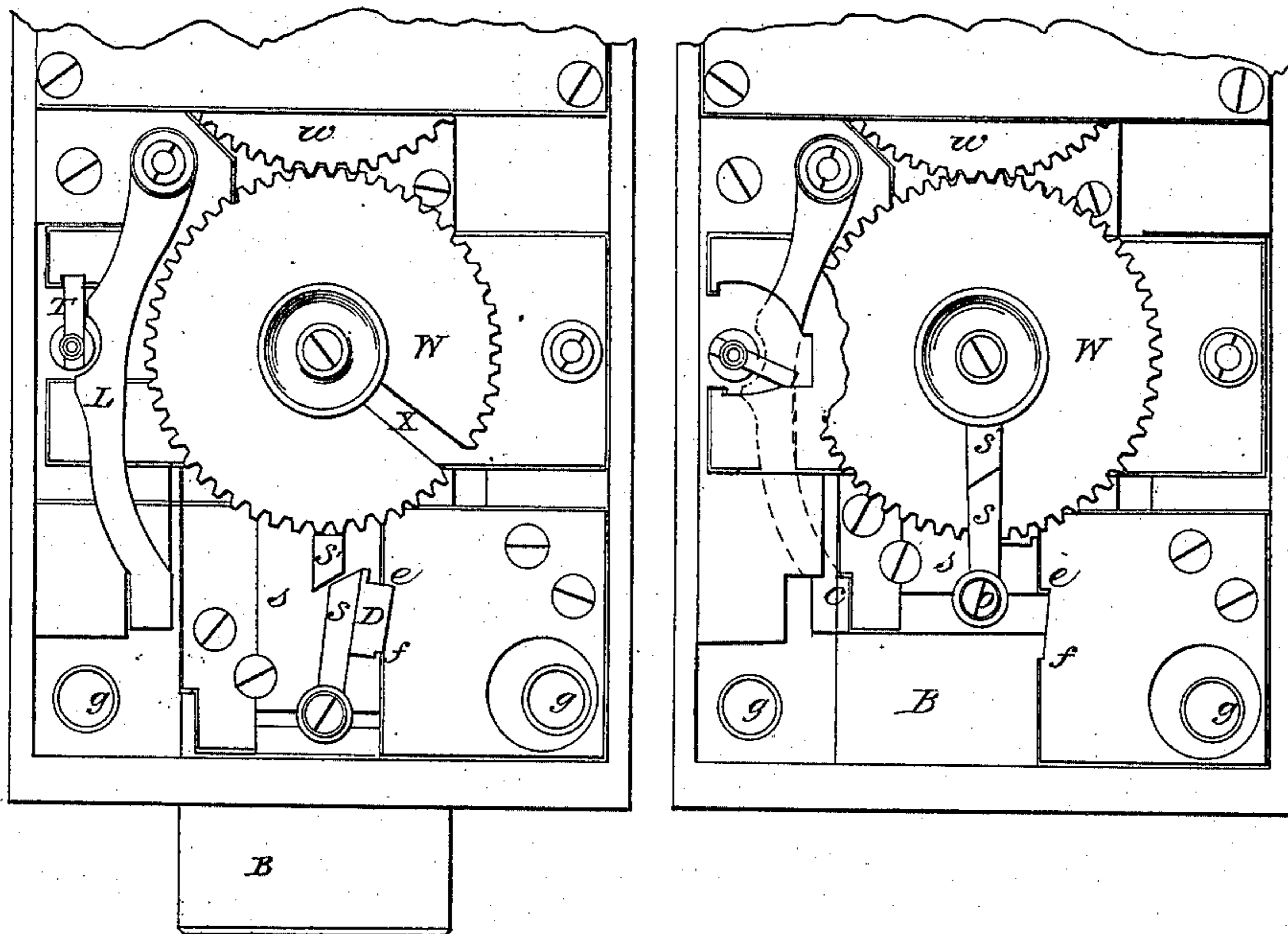
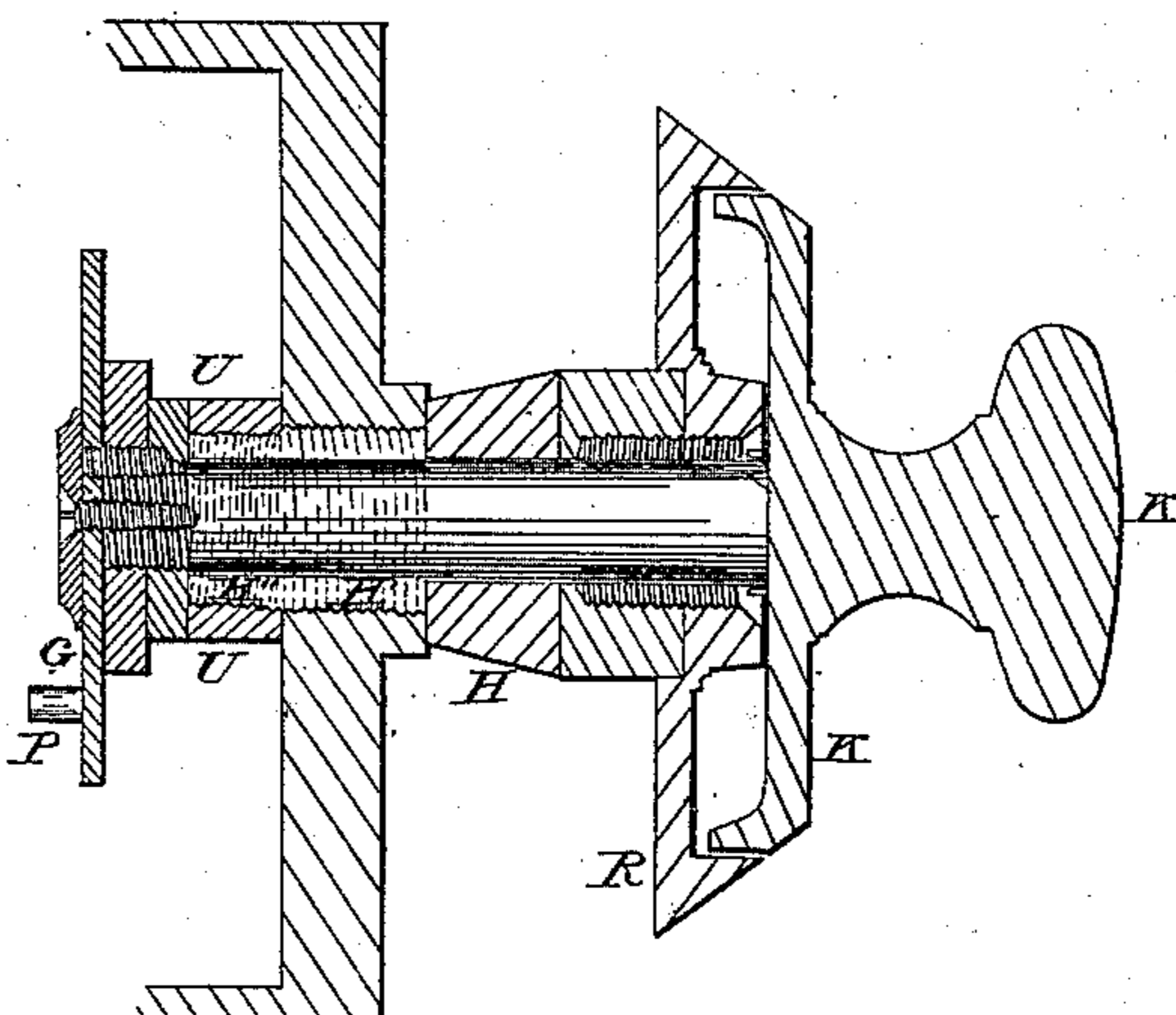
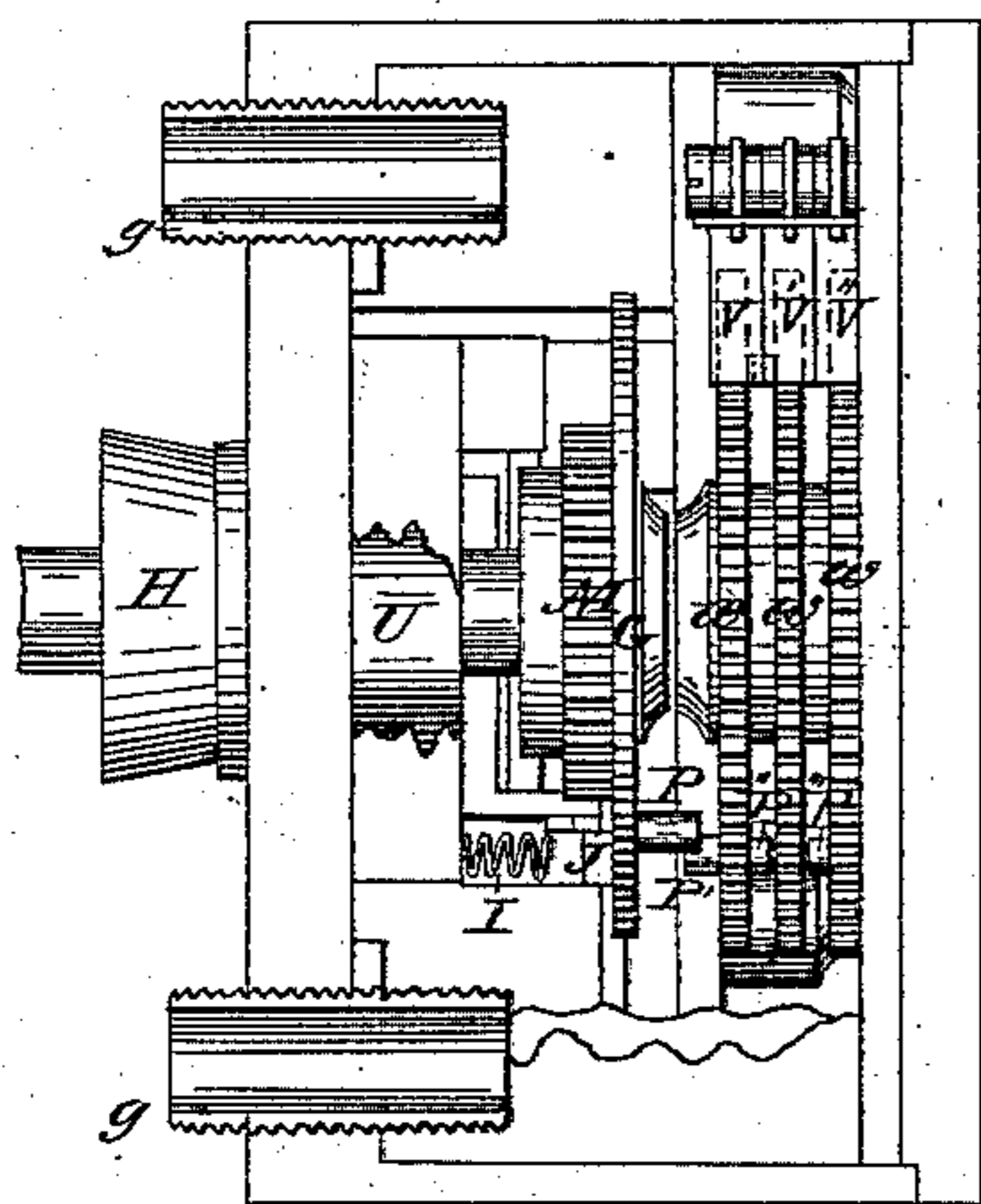


Fig. 3.

Fig. 4.



Witnesses:

William Edson
Chas. A. Gardiner

Inventor

W. Hall

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Permutation Lock.

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Fig 2

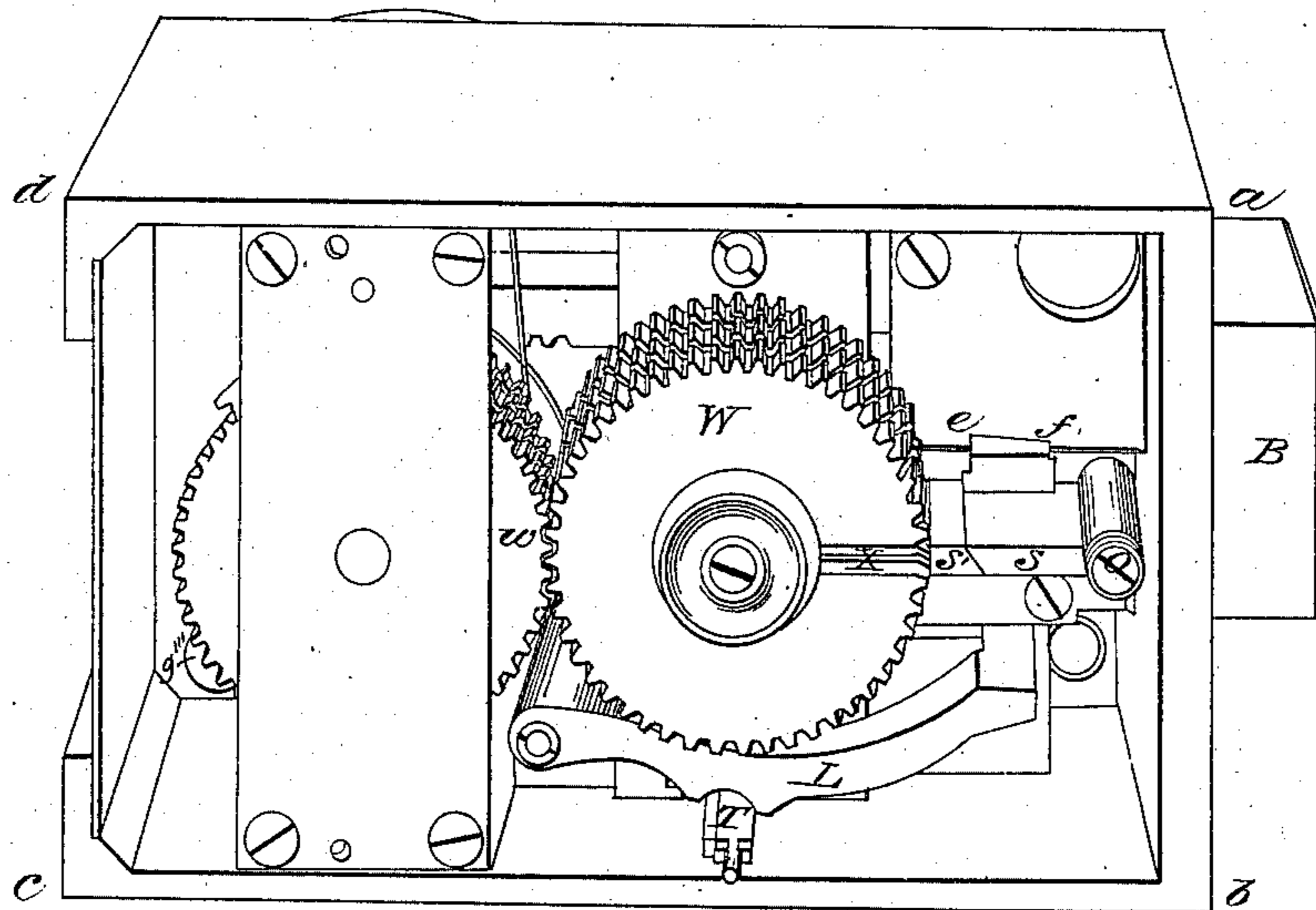
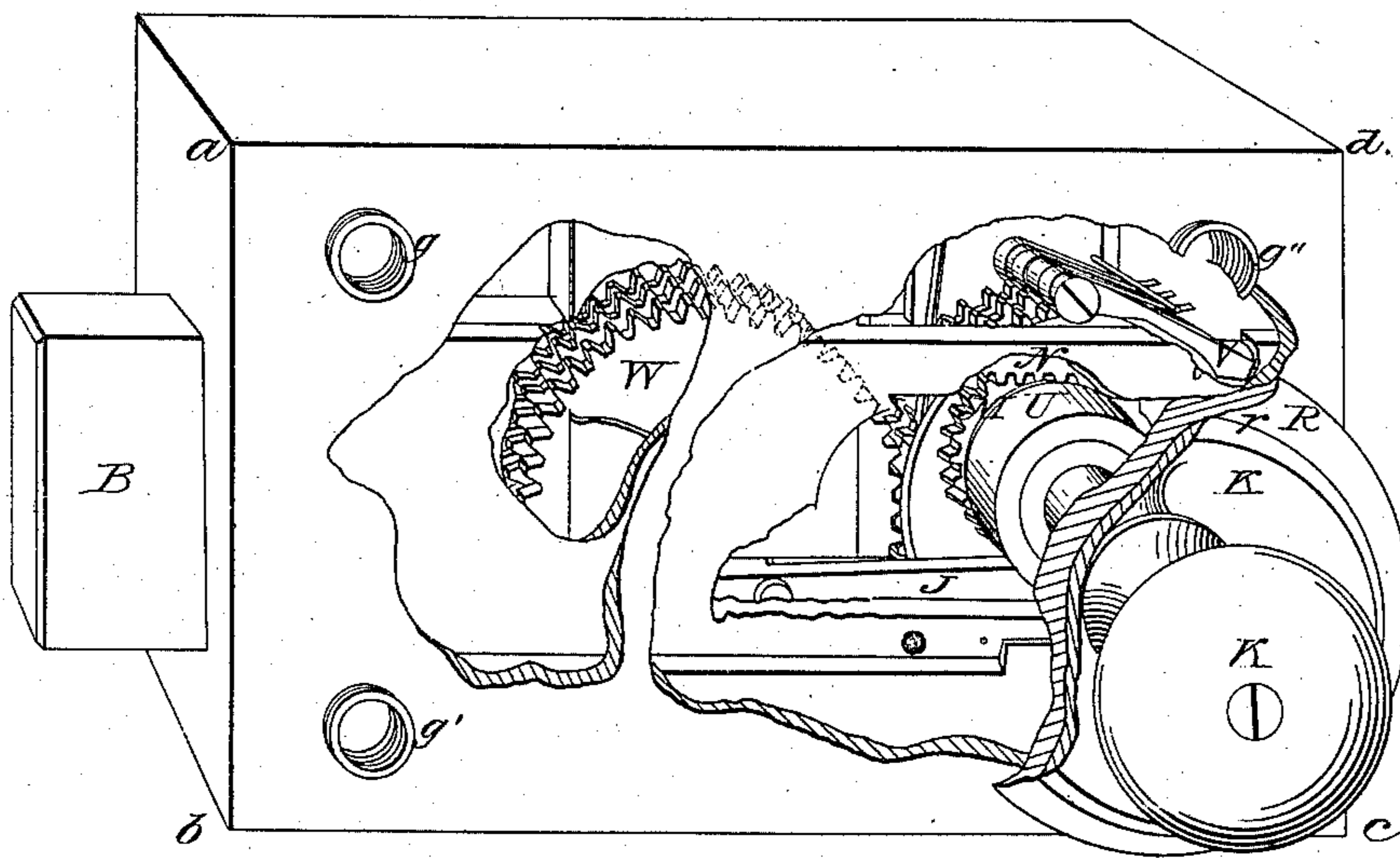


Fig 1



Witnesses:

William Eason
Chas A. Gardiner

Inventor.

Wm Hall.

UNITED STATES PATENT OFFICE.

WILLIAM HALL, OF BROOKLINE, MASSACHUSETTS.

IMPROVEMENT IN LOCKS.

Specification forming part of Letters Patent No. 47,817, dated May 23, 1865.

To all whom it may concern:

Be it known that I, WM. HALL, of Brookline, in the county of Norfolk and State of Massachusetts, have invented an Improvement in Locks, of which the following is a specification.

The nature of my invention consists in certain improvements in register-locks, to this effect, first, by securing the hub to the case of the lock by means of a right and left hand screw; second, guarding against pressing the stump against the cog wheels; third, holding the bolt in position while the cog-wheels are being set; fourth, adjusting the lock to the door by means of the hollow adjusting-screws.

To enable others skilled in the art to make and use my invention, I will proceed to describe it, reference being had to the accompanying drawings and to the letters of reference marked thereon.

Similar letters refer to similar parts.

a b c d in Drawings Nos. 1 and 2 represent case of lock; *B*, bolt; *S* and *S'*, stump divided into two parts. The part *S* is attached to the bolt *B* by the screw *O* and swings freely on the screw. That part of the stump designated *S'* is attached to the plate *s*. (Shown on drawings 5 and 6.) Plate *s* is confined by means of the screw within the groove made for that purpose in the bolt in such a manner as to admit of a slight sliding motion in the direction of the length of the bolt *B*. By this device it will be seen that the bolt *B* may be pushed back a short distance, while the part *S'* of the stump may remain stationary, thus causing the part *S* of the stump to swing up, carrying with it the dog *D* into the notch *e f*. The object of this arrangement is to prevent the operator upon the lock from feeling the openings *X* in the wheels *W W W*, Drawings 2 and 5—an operation which is performed by getting a slight pressure on the bolt to push it back. Then turning the knob *K* slowly, any motion of the bolt *B* indicates that the opening *X* of some one of the wheels *W W W* has probably come into position. By this arrangement any such pressure upon the bolt *B* will have the tendency to slide the part *S* against the part *S'*, thus raising it up and bringing the dog *D* (permanently attached to *S*) into the notch *e f*, Drawings 2, 5, and 6, thus effectually preventing any further motion of the bolt *B*.

W W W in all the drawings, except 3 and

4, are cog-wheels with openings *X*, into which the stump *S S'* may slide when the wheels are all brought into position.

w w w in all the drawings, except 4, are cog-wheels, which may be revolved by means of the knob *K*.

G in Drawings 3 and 4 is a disk permanently attached to the spindle of the knob *K*.

P in Drawings 3 and 4 is a pin in the disk *G*.

P' P'' P''' are pins in the cog-wheels *w w w*. The four pins—viz., *P P' P'' P'''*—are so placed that no one of the wheels *w w w* or the disk *G* can make a complete revolution without bringing the pin of some wheel in contact with the pin of another. Thus, if we revolve the knob *K* (which turns the disk *G*) the pin *P* of the disk *G* will come in contact with the pin *P'* and will cause the first wheel to revolve. The pin *P'*, coming in contact with the pin *P''* of the second wheel, will cause that to revolve. The same operation continued will cause the third wheel to revolve.

The set of cog-wheels *W W W* may be thrown out of gear from the wheels *w w w* by means of the key *T*.

The key *T* serves a double purpose—viz., that of throwing the cog-wheels out of gear by acting upon the vibrating plate *V*, Drawings No. 5 and 6, which hinges upon the screw *Z*, Drawings No. 5 and 6, and upon which the cog-wheels are hung, and at the same time raising the lever *L* up into the notch *c*, Drawings 5 and 6, of the bolt *B*, for the purpose of holding the bolt immovable while the wheels *w w w* are out of gear and are being set by the register.

K' in Drawings 1 and 4 is a disk fixed to the knob *K*, with edge graduated by means of small black lines into fifty equal parts. These divisional lines are numbered.

R in Drawings 1 and 4 is a disk fixed permanently to the lock. This disk has but one mark, *r*, upon it.

To illustrate the use of this part of the lock, I will proceed to describe the method of adjusting the cog-wheels *w w w* and of using the lock in actual practice. To adjust the wheels *w w w* (first premising it to be unlocked) by means of a key, I turn the key *T*, throwing up latch *L*, fastening the bolt *B* in position, and throwing the cog-wheels *W W W* out of gear, thus leaving the cog-wheels *w w w* and the knob *K*, which is indirectly attached to them, free to revolve. I then turn the knob

K to the right until all the wheels *w w w* are revolving together; then set the disk K' so that any number on it—5, for instance—coincides with the mark *r* on the disk R; then revolve the knob K and disk K' in an opposite direction more than twice, but less than three times, and set any division—say 45—to coincide with the mark *r*; reverse the motion again, revolve the knob and disk until the cog-wheels begin to move, (which will be indicated by the feeling,) but always less than twice, and set any division—say 50—to coincide with the mark *r*. The lock is now set on 5, 45, and 50; throw the bolt out by pulling the knob K toward you and turning it to the left; let the knob spring back, and revolve it each way two or three times. To unlock it, I turn the knob to the right till all three wheels are revolving together; then bring division 5 of the disk K' to coincide with the mark *r*; then turn to the left more than twice, but less than three times, and bring division 45 of disk K' to coincide with mark *r*; reverse the motion again and turn the knob K till the wheels begin to revolve, but always less than twice; bring division 50 to coincide with mark *r*; pull the knob K toward you, (which will bring the teeth of the cog-wheel M into the ratchet N, Drawings,) and then turn to the right, drawing the bolt in.

J is a bar, hinged at one end to the bolt, the surface of which back toward its free end is held in contact with the disk G by a spiral spring, I, interposed between the tail of the bolt and the bar, the purpose of all which is to force the disk K back into its socket R so soon as the hand releases its hold upon the knob.

M in Drawings 1 and 3 is a small cog-wheel attached to disk G and revolving with it. It acts against ratchet N, which is a part of the bolt B. (Shown in Drawing 1 out of gear.)

g g' g'' g''' in Drawings 1, 3, 5, and 6 are hollow screws for the purpose of adjusting the lock to the iron door. They have slots cut across the end within the lock to take a screw-driver.

H in Drawings 3 and 4 is the hub; H', right-hand screw cut on the shank of the hub H; H'', left-hand screw, upon which the check-nut U is screwed. The advantage of this arrangement is that the hub H having been screwed into the case of the lock, and the check-nut U screwed upon it, the hub cannot be started from the outside.

V V V in Drawings 1 and 3 three brakes, acting upon the cog-wheels *w w w*, for the purpose of holding them steadily in position.

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

1. Fastening the hub by means of the right-hand screw H' through the case of the lock, and the left-hand screw H'', or vice versa, combined with the check-nut U.
2. Making the stump in two parts, S and S'.
3. The peculiar arrangement of the lever L and the key T, so that at the time the cog-wheels are thrown out of gear the bolt shall be immovable.
4. The hollow adjusting-screws *g g' g'' g'''*, all of which operate substantially as described, and for the purpose set forth.

WM. HALL.

Witnesses:

WILLIAM EDSON,
CHAS. A. GARDINER.