(No Model.)

W. E. SPARKS.

LOCK.

No. 562,204. Patented June 16, 1896.

Fig. 1.

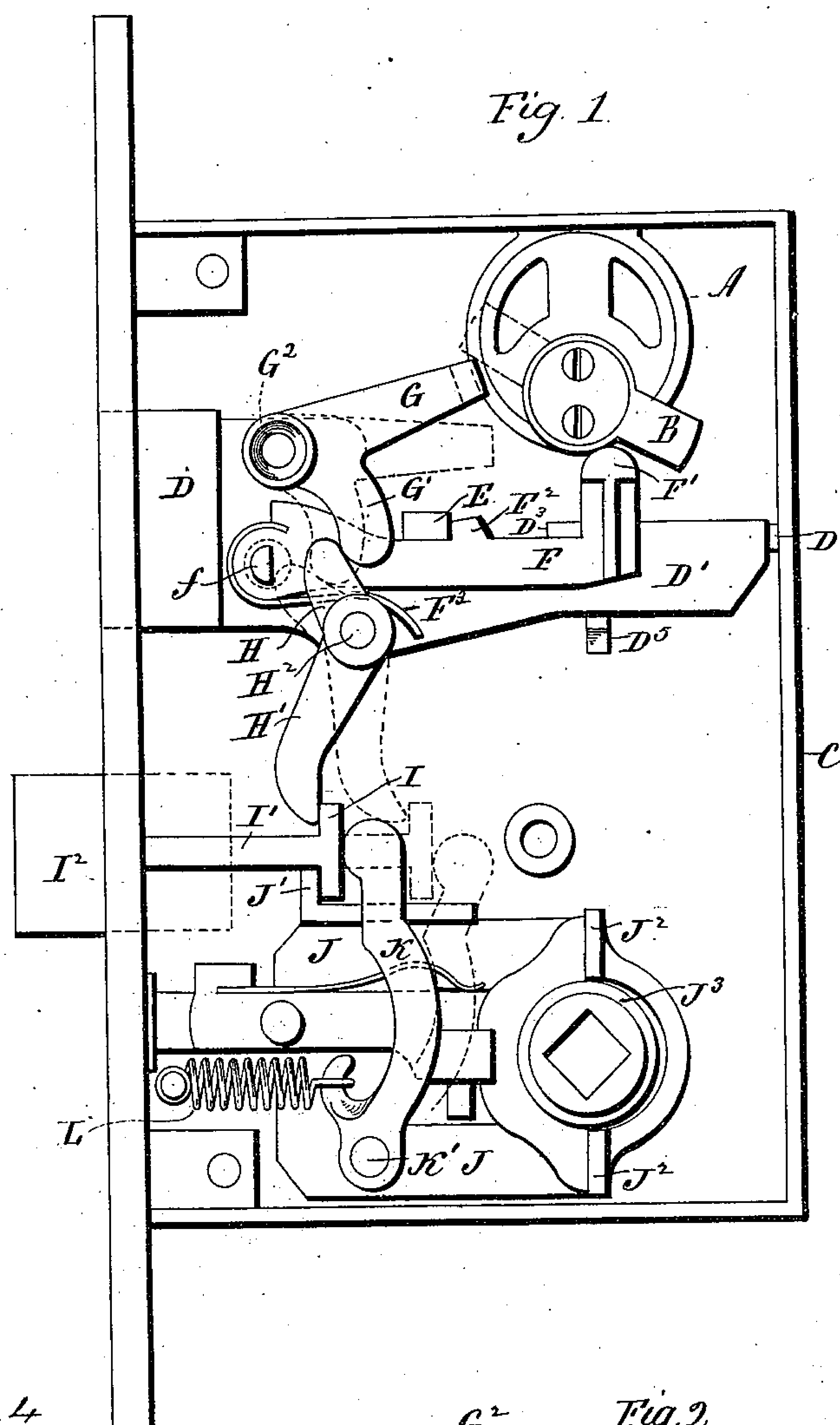


Fig. 4

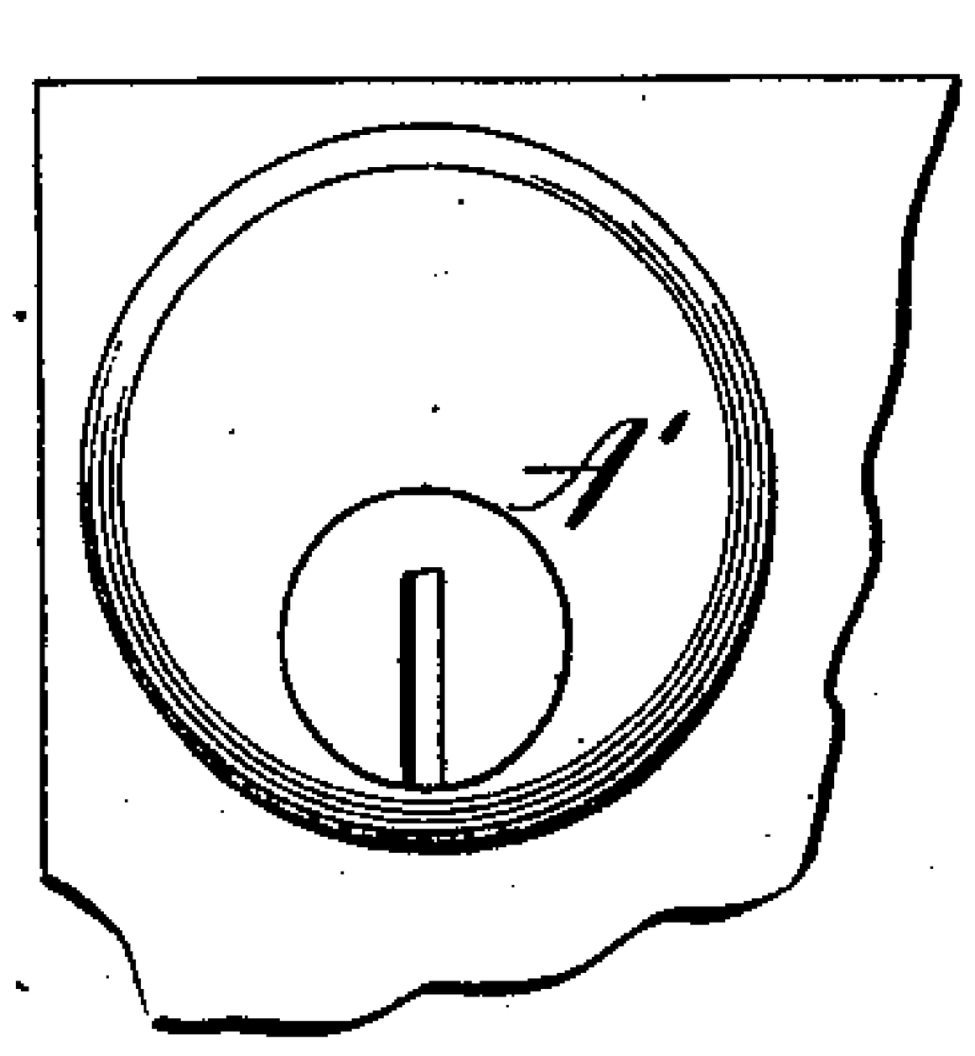


Fig. 2

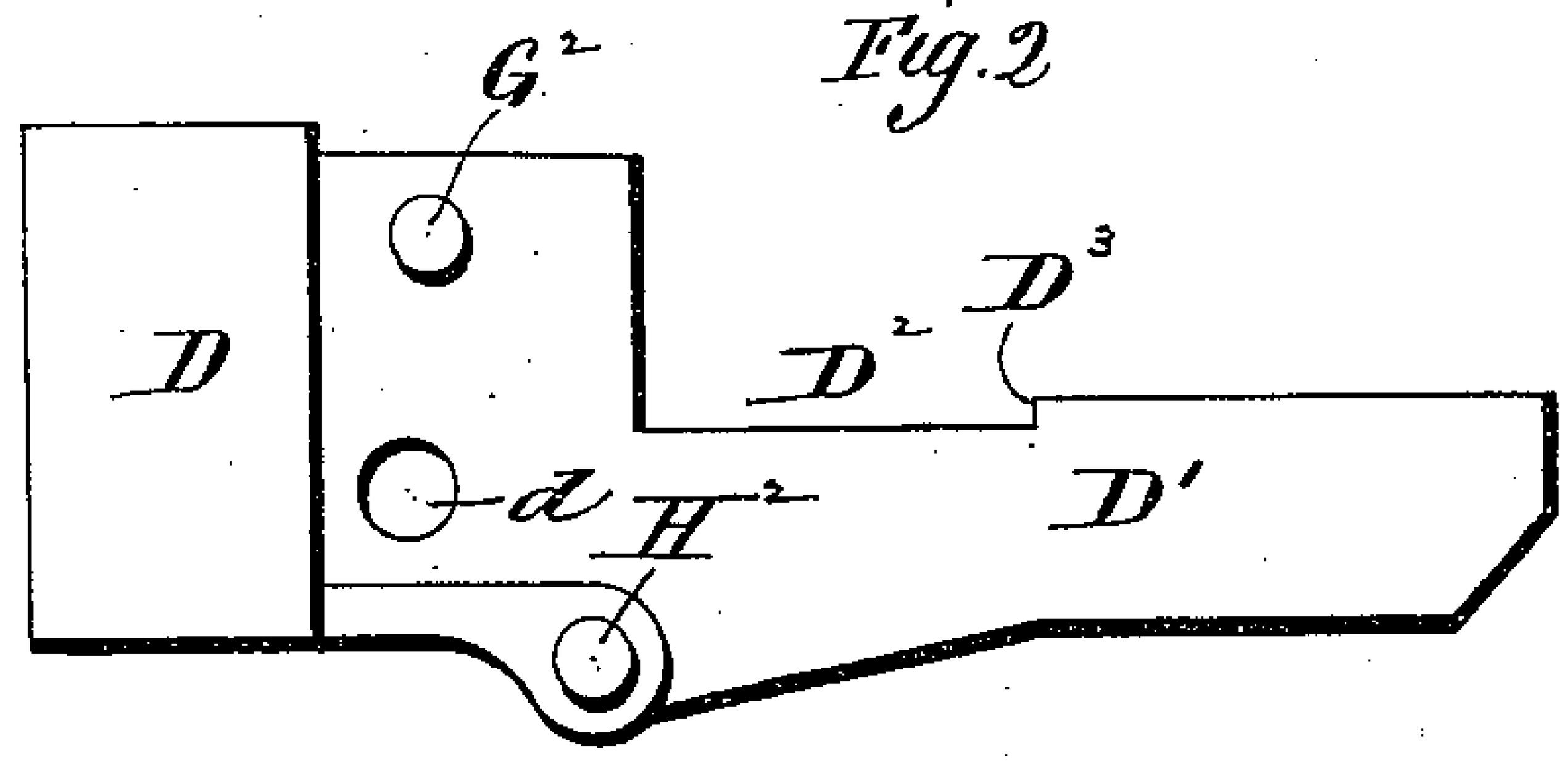
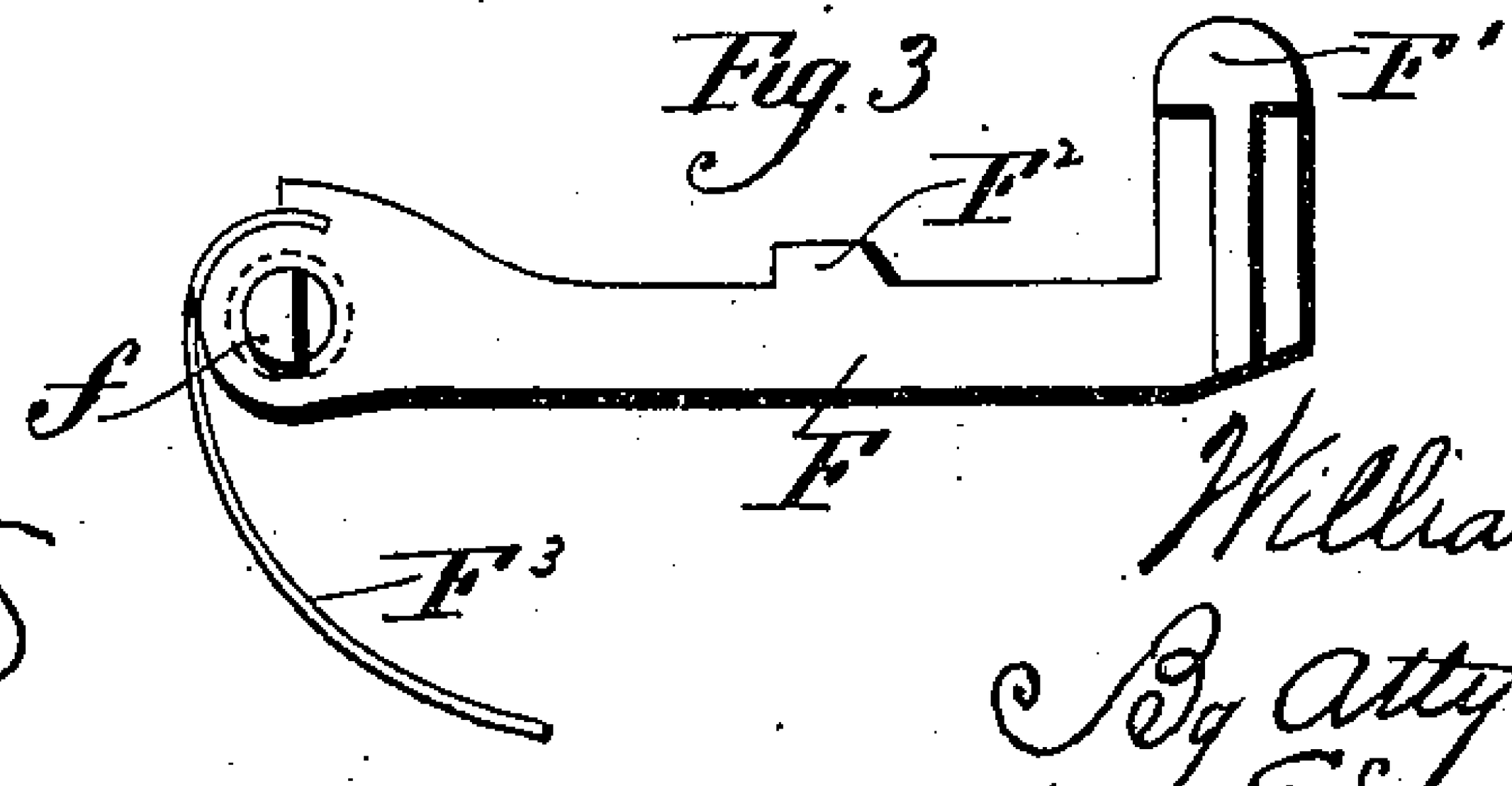


Fig. 3



Witnesses
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UNITED STATES PATENT OFFICE.

WILLIAM E. SPARKS, OF NEW HAVEN, CONNECTICUT, ASSIGNOR TO THE SARGENT & COMPANY, OF SAME PLACE.

LOCK.

SPECIFICATION forming part of Letters Patent No. 562,204, dated June 16, 1896.

Application filed October 29, 1894. Serial No. 527,172. (No model.)

To all whom it may concern:

Be it known that I, WILLIAM E. SPARKS, of New Haven, in the county of New Haven and State of Connecticut, have invented a new Improvement in Locks; and I do hereby declare the following, when taken in connection with the accompanying drawings and the letters of reference marked thereon, to be a full, clear, and exact description of the same, and which said drawings constitute part of this specification, and represent, in—

Figure 1, a view in inside elevation of a lock constructed in accordance with my invention; Fig. 2, a detached view of the key-bolt and its shank; Fig. 3, a similar view of the key-bolt tumbler; Fig. 4, a view in front elevation of the pin-tumbler mechanism.

My invention relates to an improvement in that class of dead-locks which have pin-tumbler mechanisms combined with them for increasing their safety, and for affording the convenience of small flat keys, the object of my present invention being to produce a simple, compact, and reliable lock of the class described, with particular reference to cheapness of manufacture and non-liability to derangement.

With these ends in view my invention consists in a lock having certain details of construction and combinations of parts, as will be hereinafter described, and pointed out in the claims.

In carrying out my invention, as herein shown, I employ a pin-tumbler mechanism located within the usual cylindrical case A, and having the inner end of its rotatable cylinder A′ furnished with a bit B. The said case A of the pin-tumbler mechanism, it will be understood, is secured in the ordinary manner to the body C of the case which contains the dead-lock mechanism proper. As herein shown, the said dead-lock mechanism has combined with it a latch-bolt mechanism with which it coöperates; but the latter may be omitted, if desired.

The key-bolt D of the dead-lock mechanism is furnished with a long, simple, talonless shank D′, having the middle portion of its upper edge cut away to form a clearance-space D^2, and a stop-shoulder D^3, the said space D^2 receiving the tumbler-stump E, with which the stop-shoulder D^3 engages to limit the outward movement of the bolt, the inward movement whereof is limited by the engagement of its extreme inner end with an abutment D^4, located within the case C aforesaid. The said shank D′ of the key-bolt is prevented from lateral displacement within the case C by means of the stump E before mentioned, and also by means of a lug D^5, upon which the lower edge of the shank rests. A tumbler F, a detached view of which is shown in Fig. 3, is mounted upon the bolt-shank D′, the forward end of which is thereto provided with a pivot-hole *d*, to receive a heavy pivot *f*, formed upon the under face of the extreme forward end of the tumbler which bears upon the shank, and is constructed at its rear end with an upturned operating-arm F′, the opposite faces of which are beveled for engagement by the bit B of the pin-tumbler mechanism and which extends upward above the upper edge of the key-bolt. The upper edge of the said tumbler is constructed with a stop-finger F^2, which engages with the opposite edges of the stump E, before mentioned, for locking the tumbler and hence the key-bolt in either of its positions. A spring F^3, attached to the forward end of the tumbler, is provided for exerting a constant effort to lift the same, so as to keep its upper edge in contact with the stump E.

It will be understood, by reference to Fig. 1 of the drawings, that for the purpose of throwing the key-bolt into its locked position the key must be turned from right to left, so as to engage the bit with the inner face of the operating-arm F′ of the tumbler, which is thus thrown downward against the tension of its spring until its stop-finger F^2 clears the stump E, after which it is moved forward, carrying the key-bolt with it, until the stop-shoulder D^3 thereof engages with the stump, immediately after which the stop-finger of the tumbler is lifted up in front of the stump by the spring F^3 of the tumbler, whereby the same acts to lock the key-bolt in its projected position. The operating-arm of the tumbler now arrests the further rotation of the bit from right to left, so that for the removal of the key the bit must be turned back from left to right for a half-turn. To retract the

bolt, the key is turned so as to swing the bit from left to right and engage it with the outer face of the operating-arm of the tumbler, which will be depressed against the tension of its spring until its stop-finger F^2 has been cleared from the stump E, after which the bit will operate through the medium of the tumbler to draw the bolt-shank rearward until the extreme inner end of the same has engaged with the abutment D^4, located in the case C. By the time this engagement has taken place, the locking-lug of the tumbler has been reëngaged with the inner edge of the stump, so as to lock the bolt in its retired position. The operating-arm of the tumbler now prevents the bit of the pin-tumbler mechanism from being turned farther from left to right, so that for the removal of the key the bit must be turned back from right to left for a half-turn. It will thus be seen that after the bolt has been thrown in either direction, the key must be reversed for half a turn before it may be removed. It will also be noted that the shank of the key-bolt is made without talons, thus securing a simple construction and greatly reducing the amount of fitting required to make the lock properly operative.

The latch-bolt mechanism shown herein comprises an upper latch-lever, having two arms G and G′, and a lower latch-lever having two arms H and H′, the upper lever being hung upon a pin G^2, carried by the key-bolt shank, and the lower lever being hung upon a pin H^2, carried by the said shank. The arm G of the upper lever is arranged to be engaged by the bit B of the pin-tumbler mechanism, when the key-bolt is retracted, while the arm G′ of the said lever is arranged to engage with the arm H of the lower latch-lever, the lower arm H′ of which engages with the upper end of the cross-head I of the shank I′ of the latch-bolt I^2, so that when the said upper and lower latch-levers are operated the latch-bolt will be retracted. Provision is also made for retracting the latch-bolt by means of a carriage J, having a finger J′ engaging with the lower end of the cross-head of the latch-bolt shank I′, and having fingers J^2 J^2, which are engaged by the hubs J^3 of the knob-spindle, only one of these hubs being shown. The said latch-bolt is thrown back into its projected position by means of an easy-spring lever K, pivotally mounted upon a pin K′ carried by the carriage J, adapted at its upper end to be engaged with the inner face of the cross-head I of the latch-bolt shank I^2, and having its lower end connected with a spiral spring L, which, under the conditions of leverage provided for it, imposes marked resistance to the rearward movement of the carriage when the same is operated by the knob, but very little resistance to the inward movement of the latch-bolt independent of the movement of the carriage.

With reference to the operation of the latch-bolt through the medium of the bit of the pin-tumbler mechanism, it is to be observed that the bit B thereof can only act upon the upper latch-lever when the same is brought into range with the bit by the retraction of the key-bolt, and even then the said lever cannot be positively acted upon by the bit except as the same engages with its upper face. I have already shown that after the key-bolt has been retracted, the further rotation of the bit in the direction which the same moved for retracting the bolt is stopped by the operating-arm of the tumbler, and that the bit must be turned back for a half-turn in order to remove the key. As it turns back, it engages with the lower edge of the arm G of the upper latch-lever, simply tripping the same. After the bit has thus tripped the said latch-lever, it may be then turned so as to engage with the upper edge thereof, whereby the said lever and the lower latch-lever may be operated against the tension of the easy-spring L for retracting the latch-bolt. It will thus be understood that after the key-bolt has been retracted, the bit must be turned back as though preparatory to the removal of the key, and then reversed in movement so as to retract the latch-bolt. This feature of operation makes the lock a very safe one, as the operation of the lock must be well understood in order to operate the latch-bolt after the key-bolt has been shot back; but, as elsewhere stated, I do not limit myself to embodying my invention in locks which combine latch-bolt mechanisms with their key-bolt mechanisms.

It is obvious that in carrying out my invention some changes from the construction shown and described may be made, and I would therefore have it understood that I do not limit myself to the same, but hold myself at liberty to make such variations therein as fairly fall within the spirit and scope of my invention.

Having fully described my invention, what I claim as new, and desire to secure by Letters Patent, is—

1. In a lock, the combination with a key-bolt having a talonless shank, of a locking-tumbler pivoted thereto and provided with a rigidly-connected operating-arm constructed and arranged so that the bit with which it coacts cannot pass it in either direction and to have its opposite faces engaged by the bit for operating the tumbler to release the bolt, and for operating the tumbler to project and retract the bolt which is shot back and forth solely through the medium of the tumbler and the arm thereof, substantially as set forth.

2. In a lock, the combination with a key-bolt having a talonless shank, of a locking-tumbler pivoted thereto and provided with a rigidly-connected operating-arm constructed and arranged so that the bit with which it coacts cannot pass it in either direction and to have its opposite faces engaged by the bit for operating the tumbler to release the bolt, and for operating the tumbler to project and retract the bolt which is shot back and forth

solely through the medium of the tumbler and the arm thereof, and a latch-bolt mechanism comprising an upper and a lower latch-lever, of which the upper latch-lever is pivotally mounted upon the key-bolt and adapted to be operated upon by the said bit when the key-bolt is retracted, and without disturbing the same, substantially as described.

In testimony whereof I have signed this specification in the presence of two subscribing witnesses.

WILLIAM E. SPARKS.

Witnesses:
W. H. GRAHAM,
WILLIAM S. COOKE.