

(Model.)

2 Sheets—Sheet 1.

E. C. SMITH.
LOCK FOR FREIGHT CARS.

No. 387,371.

Patented Aug. 7, 1888.

Fig. 1.

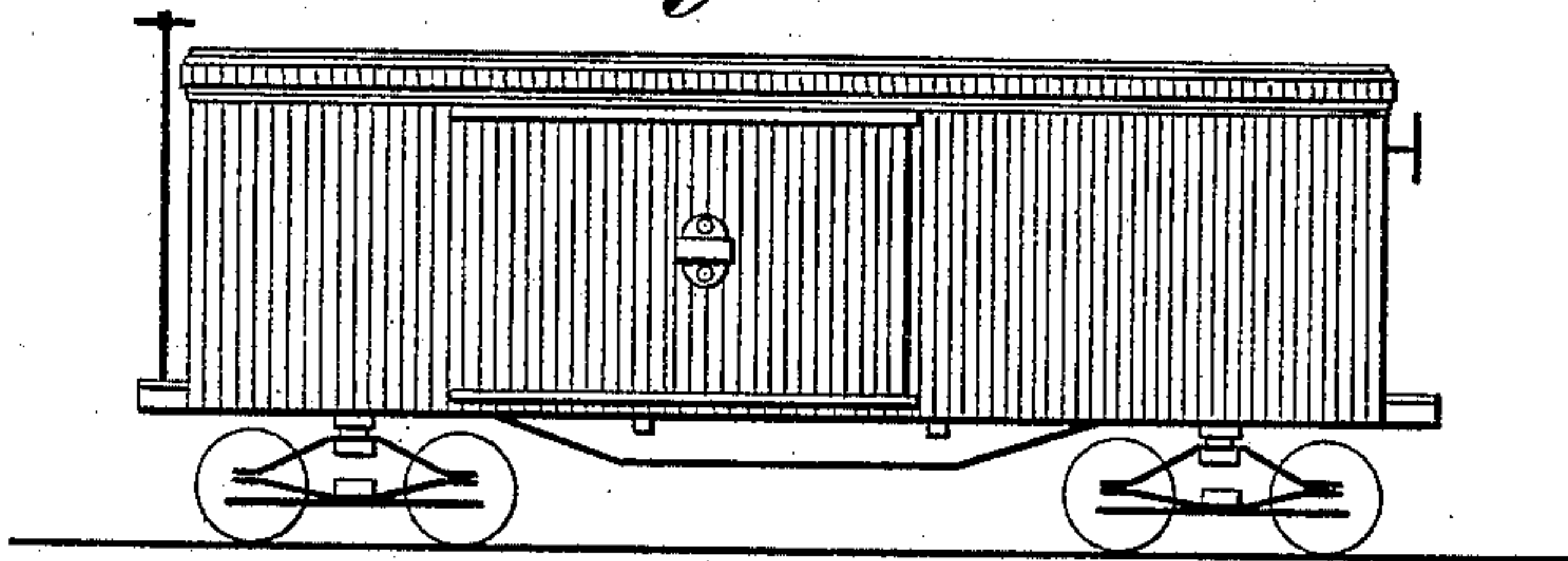


Fig. 2.

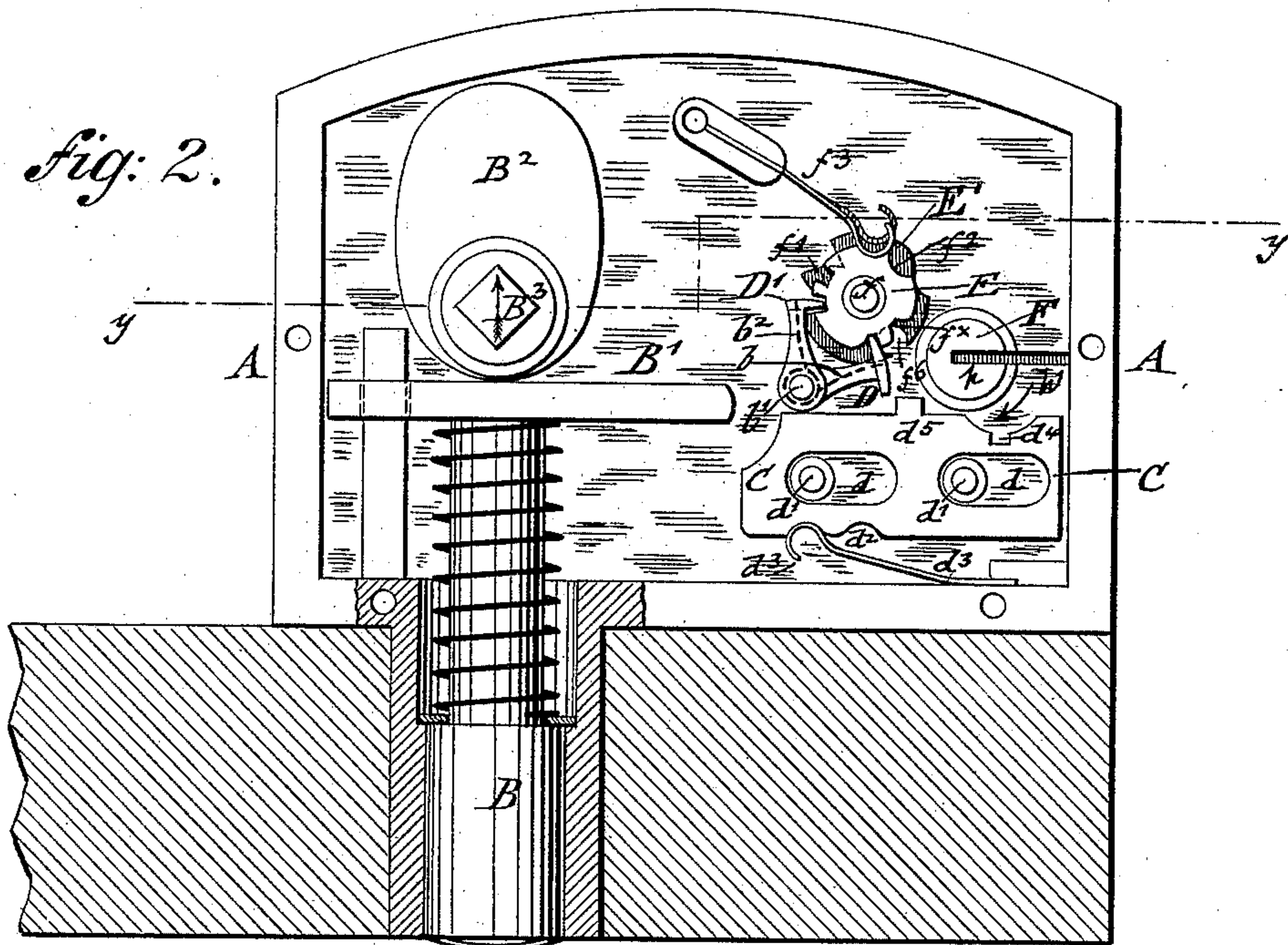
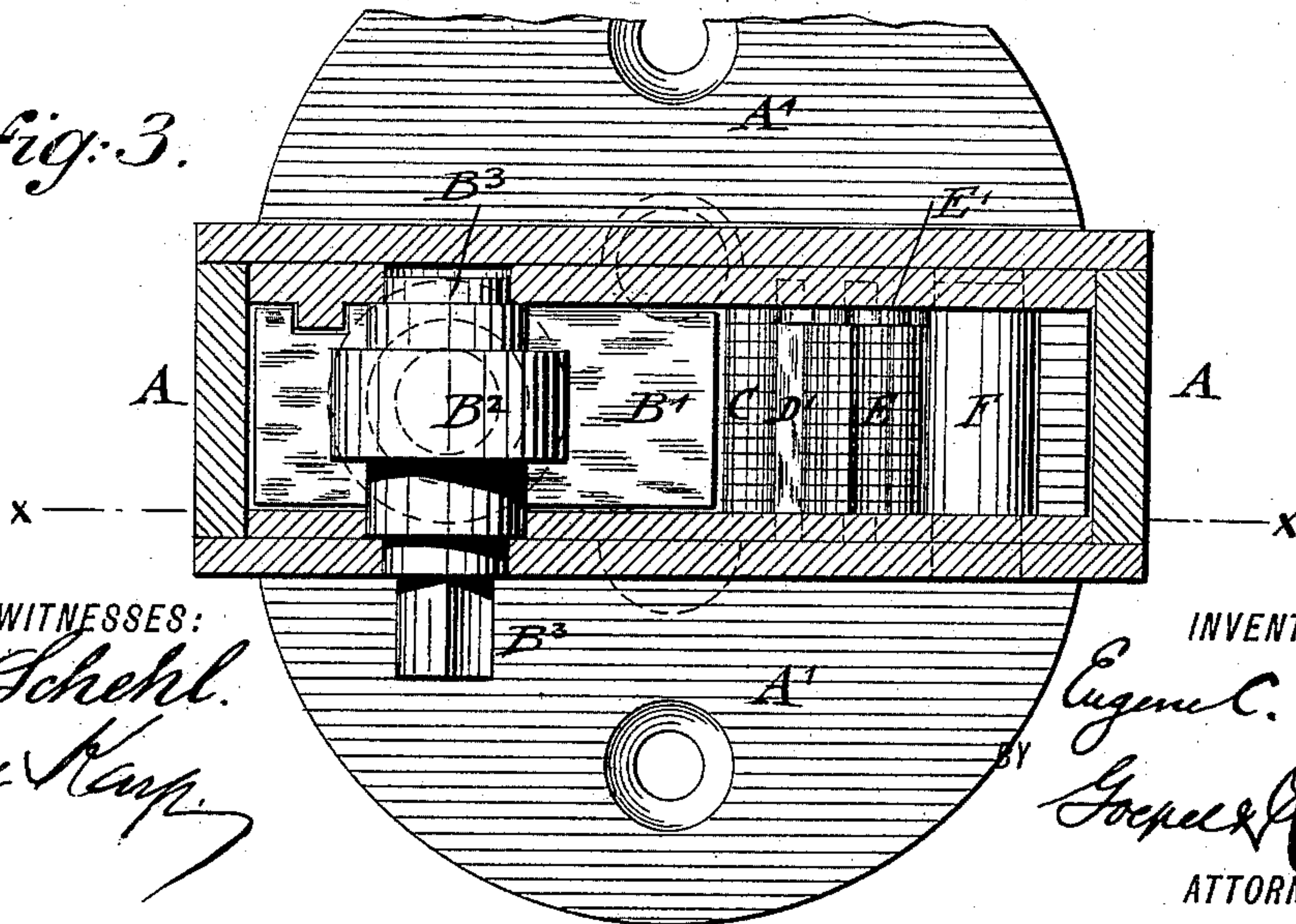


Fig. 3.



WITNESSES:
A. Schehl.
Carl Kempf

INVENTOR,
Eugene C. Smith,
BY *Goepel & Paegener,*
ATTORNEYS.

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Fig. 4.

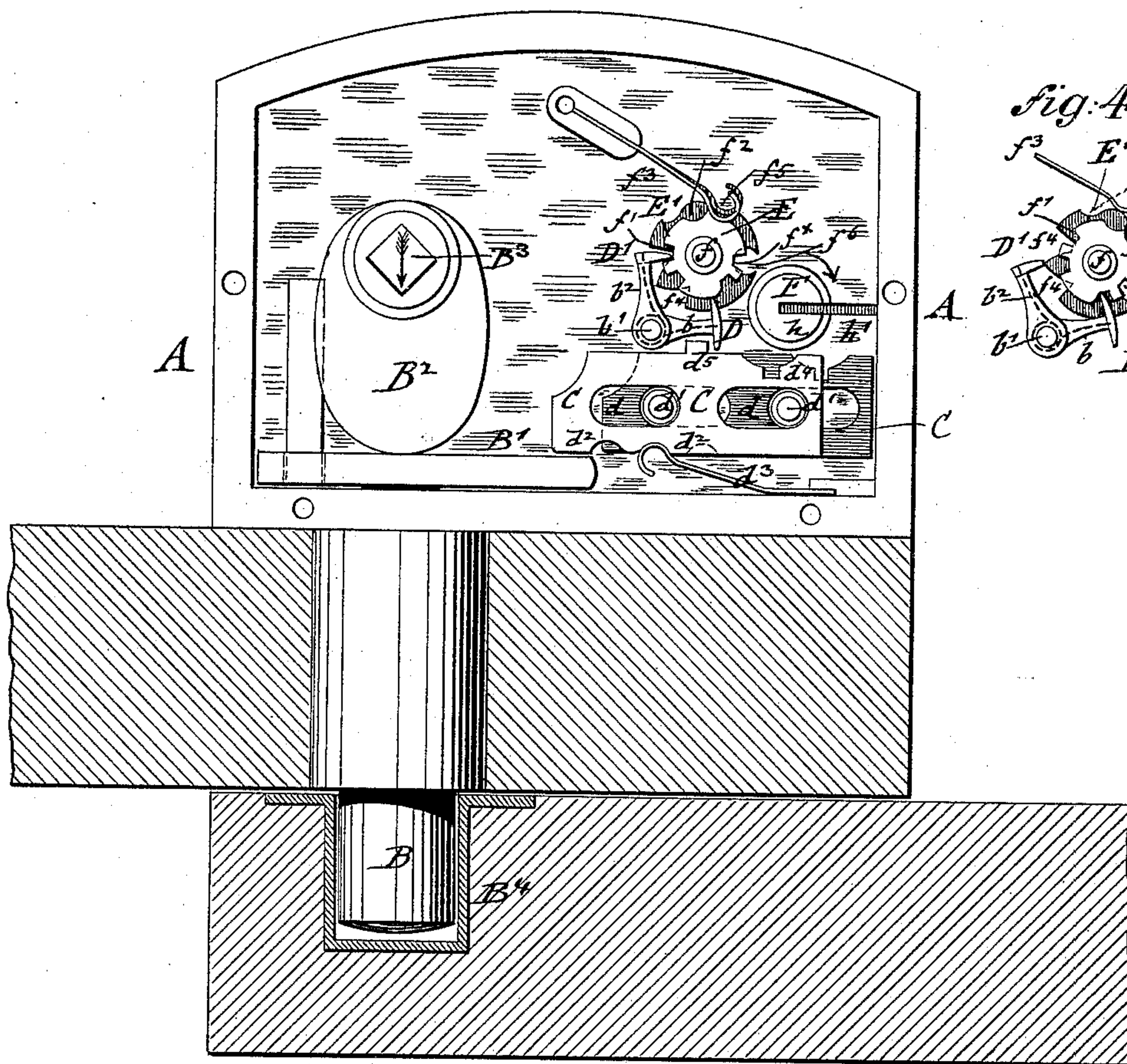
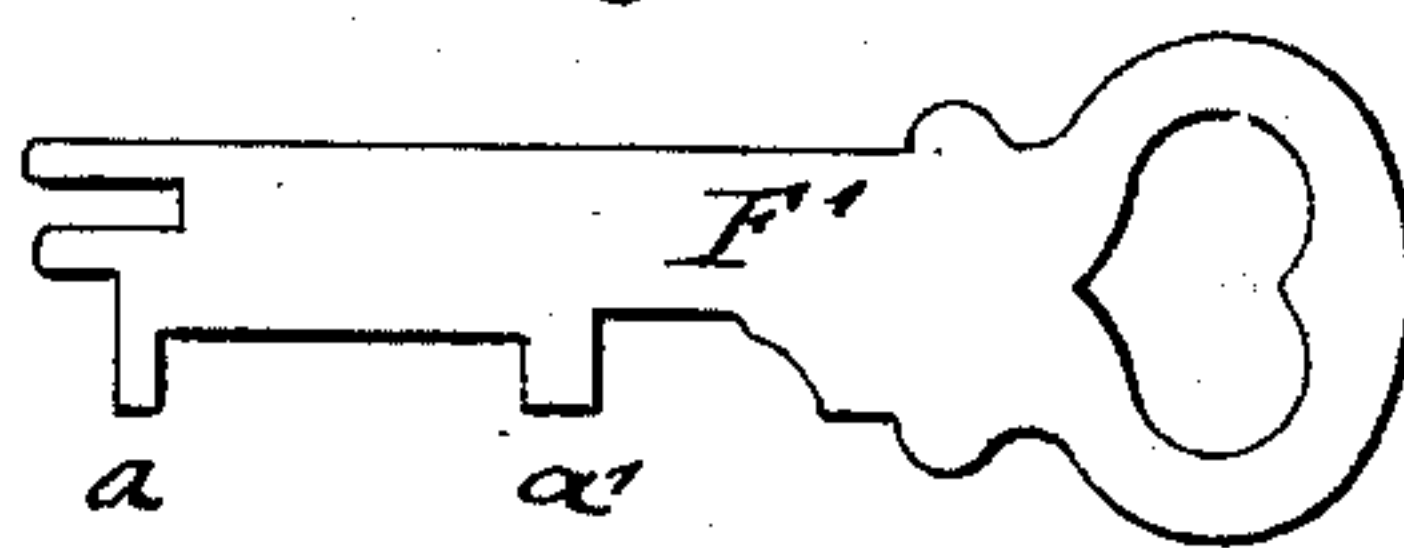


Fig. 5.

WITNESSES:
A. Schehl.
Carl Kay.



INVENTOR,
Eugene C. Smith.
BY
Stephen R. Rainer.
ATTORNEYS.

UNITED STATES PATENT OFFICE.

EUGENE C. SMITH, OF NEW YORK, N. Y., ASSIGNOR OF ONE-FIFTH TO
CHARLES F. FROTHINGHAM, OF SAME PLACE.

LOCK FOR FREIGHT-CARS.

SPECIFICATION forming part of Letters Patent No. 387,371, dated August 7, 1888.

Application filed February 3, 1888. Serial No. 262,875. (Model.)

To all whom it may concern:

Be it known that I, EUGENE C. SMITH, of the city, county, and State of New York, have invented certain new and useful Improvements in
5 Locks for Freight-Cars, of which the following is a specification.

This invention relates to certain improvements in the lock for freight-cars for which an application for Letters Patent was filed by me
10 on July 8, 1887, Serial No. 243,729, the improvement being designed with a view to simplify to some extent the construction of the lock and to furnish additional safeguards by which the picking of the lock can be pre-
15 vented.

The invention consists of a lock for freight-cars and other purposes in which the slide-bolt is locked or released by means of guided and spring-actuated tumblers, said tumblers being
20 locked by means of a transverse locking-bar, which engages projections on the tumblers. The locking-bar is applied by spring-actuated arms to a fixed spindle and adapted to engage a series of recessed and centrally-pivoted cams,
25 while a second transverse bar, which is also applied to spring-arms of said spindle, engages said cams and a recessed auxiliary cam of larger size, which is centrally pivoted to the pivot-pin of the series of cams. All the cams
30 are operated by the wards of a key, which is inserted in an axially-turning and longitudinally-recessed key-cylinder, and which throws first the sliding tumblers and engages next the auxiliary cam, so as to cause the release
35 of the first locking-bar and the clearing of all the cams, next the engagement of the series of cams and the release of the second locking-bar from the same and the locking of all the tumblers, so that they retain the slide-bolt in locked
40 position.

In the accompanying drawings, Figure 1 represents a side elevation of a freight-car with my improved lock applied to the door of the same. Fig. 2 is a vertical longitudinal section of the lock on line *x x*, Fig. 3, drawn on
45 a larger scale. Fig. 3 is a horizontal section of the same on line *y y*, Fig. 2, showing the parts of the lock in unlocked position. Fig. 4 is also a horizontal section showing the parts of the lock in locked position. Fig. 4^a
50 is a detail showing the intermediate position

of the cams in the act of throwing the tumblers, and Fig. 5 is a side view of one of the keys that is to be used with the lock.

Similar letters of reference indicate corresponding parts.

In the drawings, A represents the casing of my improved lock for the doors of freight-cars and other purposes. The casing is provided with a bracket-plate, A', at right angles there-
60 to, which bracket-plate is provided with holes for attaching the lock to the door of the freight-car by screws or otherwise.

In the casing A is arranged a spring-actuated slide-bolt, B, which is provided with a plate, B', that is acted upon by a suitable cam, B², the spindle B³ of which is operated by a lever that is attached to the outer square end of the spindle B³. When the cam B² is applied to the plate B' of the slide-bolt, the latter is moved forward into a socket, B⁴, in the
70 jamb of the car-frame, as shown in Fig. 4, while when the cam is released from the slide-bolt the same is returned into its open position by its spring, as shown in Fig. 2. Side-
75 wise of the plate B', at the inner end of the slide-bolt B, are arranged a series of tumblers, C, which are guided by slots *d d* on fixed pins *d' d'*, the tumblers being provided at one edge with notches *d²*, that are engaged by springs *d³*, which serve to retain the tumblers when in
80 normal or thrown positions.

The tumblers C are further provided at their opposite edges with recesses *d⁴* for the wards of the operating-keys, and with projections *d⁵*, which are engaged by a T-shaped trans-
85 verse locking-bar, D, when the tumblers are thrown by the key, as shown in Fig. 4, so as to retain the tumblers for locking the spring-bolt B. The locking-bar D is applied to spring-
90 actuated arms *b b* of a fixed spindle, *b'*, that is rigidly attached to the walls of the casing A.

To a second set of spring-actuated arms, *b²*, on the spindle *b'* is applied a second transverse locking-bar, D', which swings independ-
95 ently from the first locking-bar D on the spindle *b'*. Both locking-bars D and D' are adapted to engage a series of recessed cams, E, of uniform size, the number of which corresponds to the number of tumblers C. The cams E
100 are centrally pivoted to a fixed transverse pin, *f*, each cam being provided with two pairs of

recesses, $f^x f'$, for the locking-bars D and D', and with a pair of notches, f^2 , for as many retaining-springs f^3 as there are cams. The retaining-springs f^3 serve for the purpose of holding the cams steadily in position, so that the latter can be engaged by the locking-bars after they are set by the wards of the key. To the fixed pivot-pin or spindle f of the cams E is also applied an auxiliary cam, E', of somewhat larger size than the cams E, which is provided with a pair of recesses, f^4 , for the locking-bar D', a pair of notches, f^5 , for its retaining-spring f^3 , and a recess, f^6 , that is engaged by wards on the shanks of all the keys F', which are to be used with the lock. A key-cylinder, F, is arranged in proximity to the tumblers C and cams E E', and provided with a longitudinal recess, h , for the insertion of the flat key F', one form of which is shown in Fig. 5, which key is provided at the end with a ward, a , that serves to engage the notch f^6 of the auxiliary cam E', and with one or more wards, a' , that serve to engage a corresponding number of tumblers C and cams E. The key-cylinder F is supported in suitable bearings of the side walls of the casing A, and turned by inserting the key F' through a slot, h' , of the casing into the longitudinal recess h of the key-cylinder. By turning the key-cylinder by the key in the direction of the arrow shown in Fig. 3, the tumblers C, that are engaged by the projecting wards a' of the key F', are thrown forward. By turning the key-cylinder still more the ward a of the key engages the notch f^6 of the auxiliary cam E' and turns the same on its axis, so that the locking-bar D' clears the recesses f^4 and f' of the cams E' E and rides in the intermediate portion of the auxiliary cam E', located between the recesses f^4 , as shown in Fig. 4^a. The wards a' next engage one of the opposite recesses f^x of the cam E and turn the same, so that the locking-bar D is raised clear of the recesses f^x , so as to ride the cams E, while being also placed into the path of the projections d^5 on the tumblers C, so as to prevent the shifting of the tumblers in either direction, as shown in Fig. 4. The key-cylinder F then completes its motion and the key is withdrawn. As many tumblers C are thrown over the plate of the slide-bolt B as there are wards on the key.

The turning motion of the auxiliary cam E' and of the cam E is produced, respectively, by the wards a and a' of the key F', which move first the notch f^6 of the auxiliary cam E' into line with one of the recesses f^x of the cam E, as shown in Fig. 4, then one of the recesses f' out of alignment with the recess f^4 of the auxiliary cam E' and into alignment with the second recess f^4 , as shown in Fig. 4, so that the locking-bar D' re-engages the cams E and the auxiliary cam E' and holds them in locked position, while simultaneously the locking-bar D prevents the withdrawing of the tumblers moved forward by the wards of the keys. For opening the lock, the reverse operation takes place. The key is inserted in the key-

cylinder, and the auxiliary cam E' and the cams E turned on their axis, respectively, by the wards a' and a of the key, the cams E' and E producing, respectively, the oscillating of the locking-bars D and D', so as to permit the return of the auxiliary cam E', cams E, and tumblers C into their normal positions, as shown in Fig. 2.

For the purpose of preventing the opening of the lock until the car has arrived at its point of destination, even by the conductor in charge of the train, a key may be used in which no wards a' are used, but only a single ward, a , at the end for moving the auxiliary cam. If such key is introduced after the lock has been set into closed position and turned in an opposite direction to the motion of the key in setting, the ward a at the end of the auxiliary key will only move the auxiliary cam E' and set it from the position shown in Fig. 4 back to the position shown in Fig. 4^a. In this position the lock cannot be opened, even by the key by which it has been set into closed position; but it requires first a resetting of the auxiliary cam E' into the position shown in Fig. 4, when the car has to be opened on arriving at the point of its destination before it can be opened in the regular manner, as before described. By the use of such an auxiliary key, by which the auxiliary cam may be set independently of the cams E, an additional safeguard is furnished, and thereby the tampering with the lock and the opening of the same by unauthorized persons prevented.

The main feature of the present invention consists in the addition of the auxiliary cam and the arrangement of a second locking-bar for the cams, by which the picking of the lock by means of a wire or skeleton-key is prevented, as the so-called "feeling" for the cams and tumblers by the same the lock could not be opened, inasmuch as the auxiliary cam and its locking-bar act as additional safeguards for preventing the picking of the lock.

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

1. The combination of a slide-bolt, a series of guided and spring-locked tumblers, a series of recessed and centrally-pivoted cams, a recessed and centrally-pivoted auxiliary cam, oscillating and spring-actuated locking-bars applied to a common spindle, a pivoted and longitudinally-recessed key-cylinder, and a key having projecting wards adapted to engage the tumblers and cams, substantially as set forth.

2. The combination of a series of guided and spring-locked tumblers having recesses and projections, a series of recessed and centrally-pivoted cams, a recessed auxiliary cam pivoted to the same spindle as the series of cams, spring-actuated locking-bars applied to a common spindle and adapted to engage the recesses of the cams, a pivoted and longitudinally-recessed key-cylinder, and a key having projecting wards adapted to engage recesses of

the tumblers, auxiliary cam, and one series of cams, substantially as set forth.

3. The combination of a series of guided and spring-locked tumblers having projections, a series of centrally-pivoted cams having two sets of recesses, a centrally-pivoted auxiliary cam having recesses, and two oscillating and spring-actuated locking-bars applied to a common spindle, one of said locking-bars being adapted to engage the recesses of all the cams, while the second T-shaped locking-bar is adapted to engage the series of cams and the projections of the tumblers, substantially as set forth.

4. The combination of a series of recessed

and centrally-pivoted cams, a recessed auxiliary cam applied to the pivot-pin of said cam, a spring-actuated locking-bar engaging the recesses of the auxiliary and other cams, and a second spring-actuated locking-bar engaging the recesses of the series of cams, substantially as set forth.

In testimony that I claim the foregoing as my invention I have signed my name in the presence of two subscribing witnesses.

EUGENE C. SMITH.

Witnesses:

JOHN A. STRALEY,
PAUL GOEPEL.