

No. 678,956.

Patented July 23, 1901.

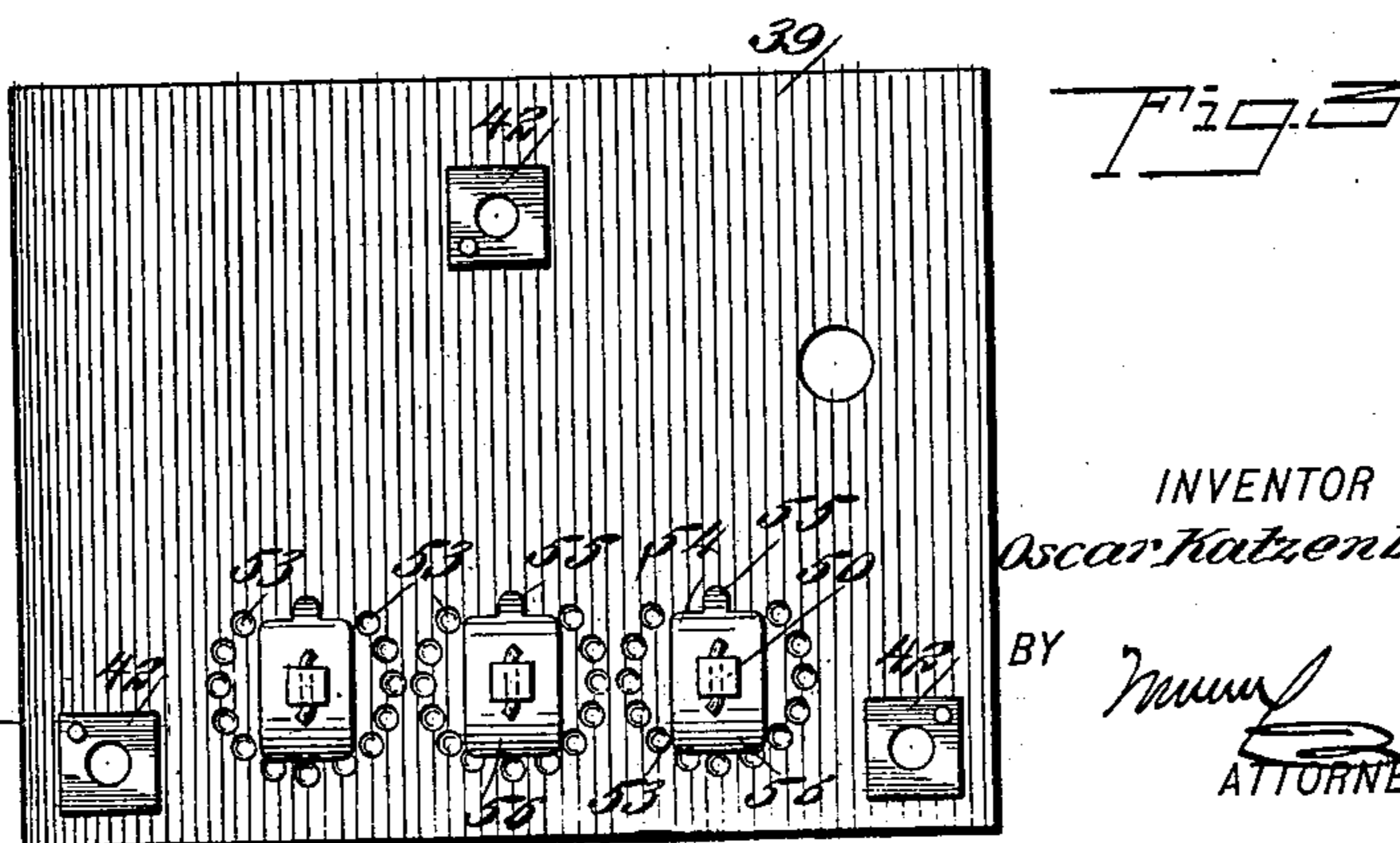
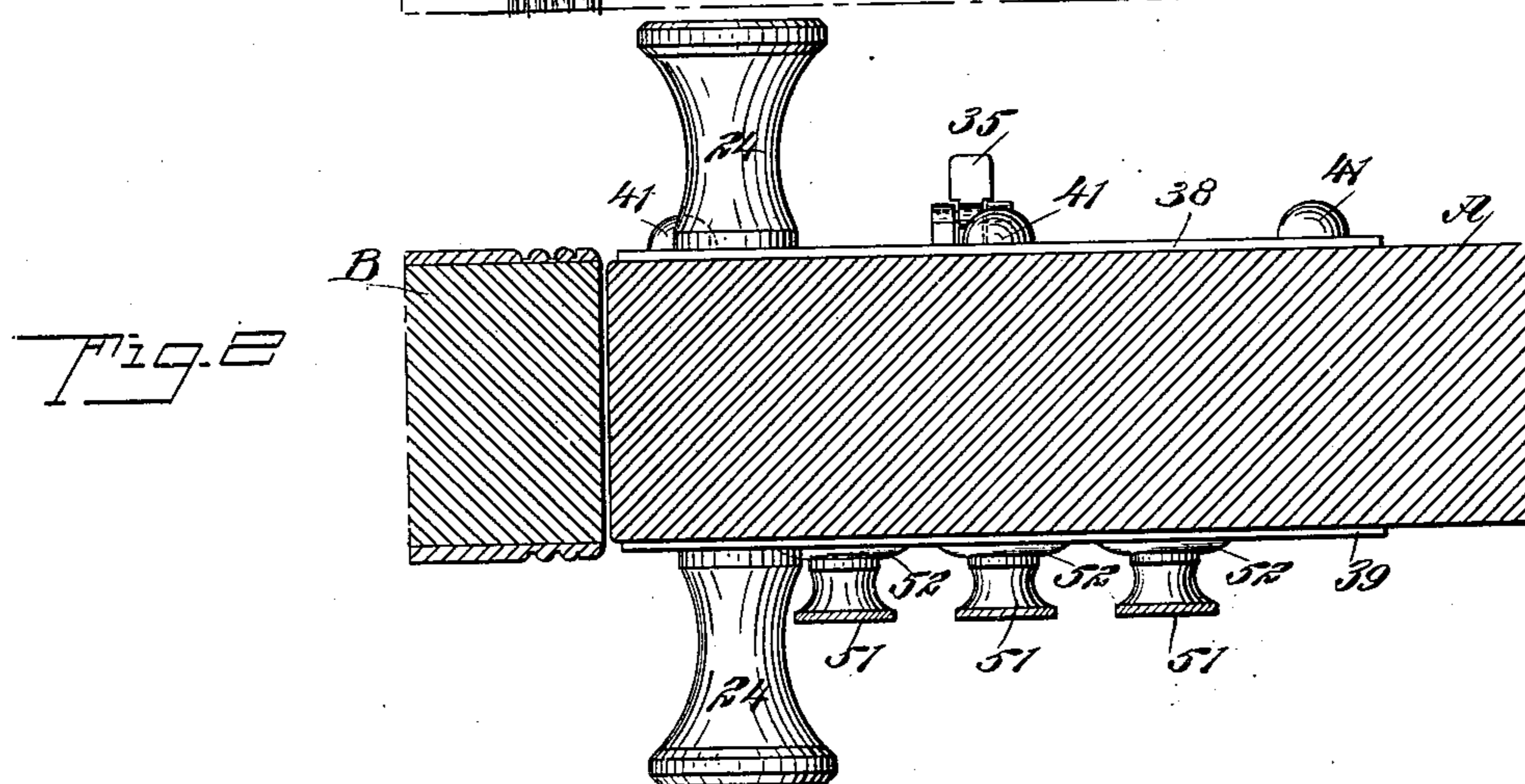
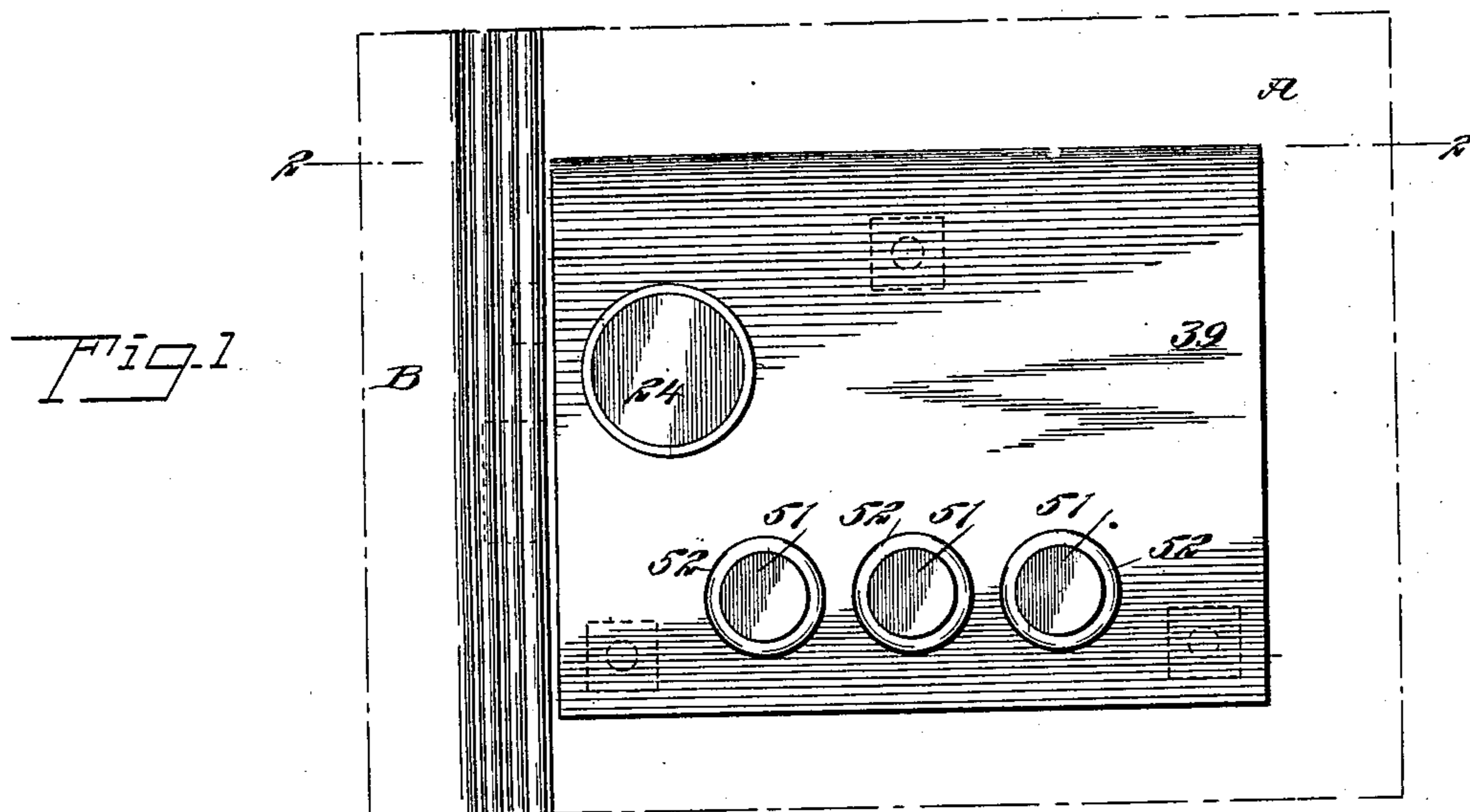
O. KATZENBERGER.

LOCK.

(Application filed Oct. 16, 1900.)

(No Model.)

2 Sheets—Sheet 1.



WITNESSES:

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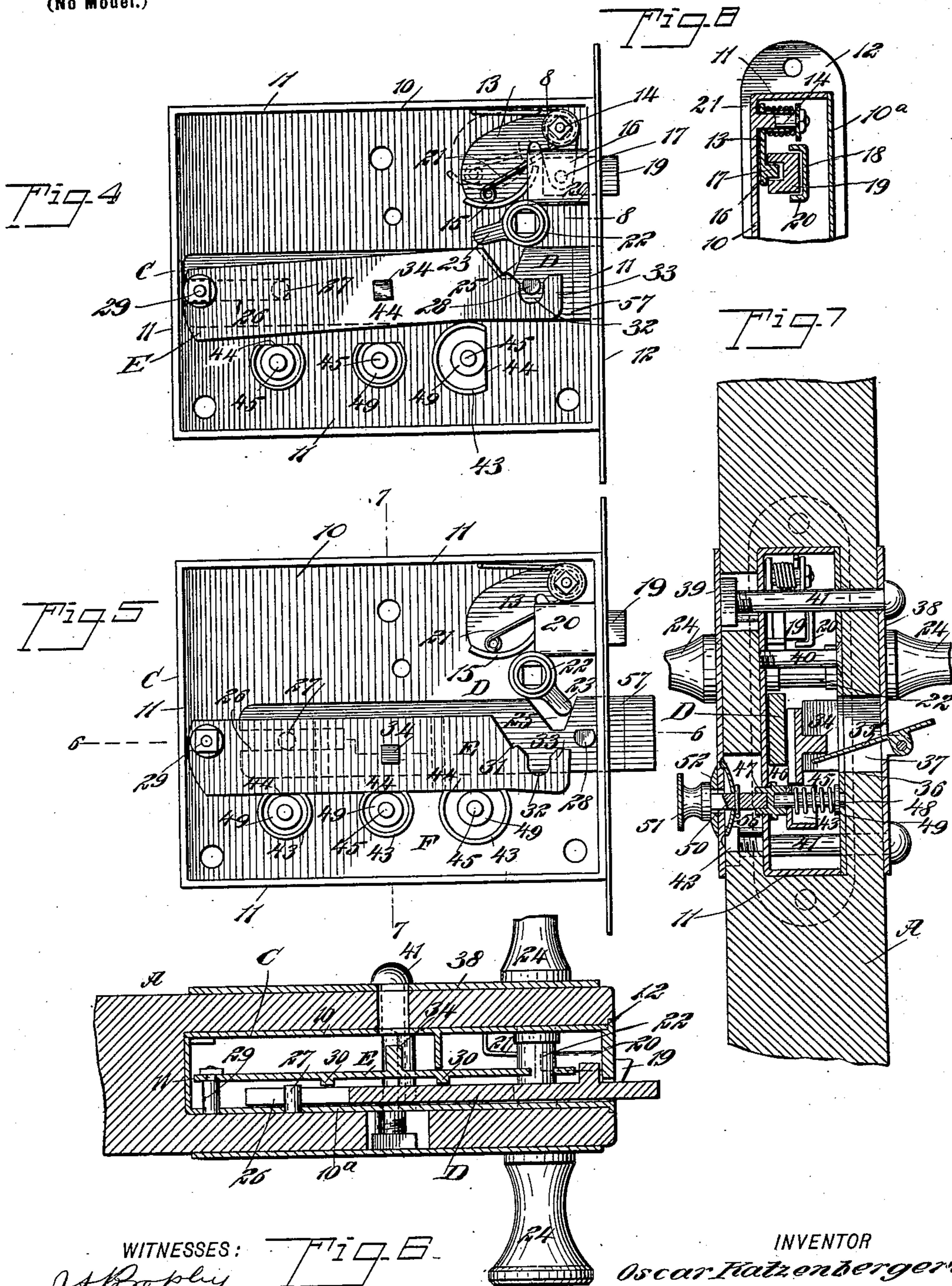
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(No Model.)

2 Sheets—Sheet 2.



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UNITED STATES PATENT OFFICE.

OSCAR KATZENBERGER, OF SAN ANTONIO, TEXAS, ASSIGNOR OF ONE-HALF
TO HUBERT UHL, OF SAME PLACE.

LOCK.

SPECIFICATION forming part of Letters Patent No. 678,956, dated July 23, 1901.

Application filed October 16, 1900. Serial No. 33,257. (No model.)

To all whom it may concern:

Be it known that I, OSCAR KATZENBERGER, a citizen of the United States, and a resident of San Antonio, in the county of Bexar and State of Texas, have invented a new and useful Improvement in Locks, of which the following is a full, clear, and exact description.

The invention relates to keyless locks, or locks which are provided with knobs arranged to indicate certain combinations in figures or letters.

One purpose of the invention is to so construct a combination-lock that independent knobs controlling the combinations will be located at the outside of the lock or outside of the door upon which the lock is placed, the said knobs being adapted to permit or to prevent the movement of the bolt, and, furthermore, to so construct the knobs and their attached parts that numbers or characters need not be produced around the knobs or the plates through which they pass; but the numbers of the combination and their arrangement may be determined by sound or by touch.

Another purpose of the invention is to provide means whereby the bolt may be rendered free to move independent of the knobs expressing the combinations of numbers or characters, which means are located at the inner face of the door or lock and enable the door to which the lock is applied to be instantly opened from the inside even if the bolt is in locking position and held in the said position by said knobs.

Another purpose of the invention is to provide a knob-spindle for the lock and a spring-latch operated by said spindle, the spindle being adapted to move the bolt when a combination is properly set or when the releasing means at the inside of the door or lock have been properly manipulated.

Another purpose of the invention is to provide a means whereby a combination may be readily changed whenever desired and to construct a lock of the character above set forth with the least possible number of parts and to so form and locate the parts employed that they will not be liable to accidental disarrangement.

The invention consists in the novel con-

struction and combination of the several parts, as will be hereinafter fully set forth, and pointed out in the claims.

Reference is to be had to the accompanying drawings, forming a part of this specification, in which similar characters of reference indicate corresponding parts in all the figures.

Figure 1 is an outer face view of the lock applied to a door. Fig. 2 is a horizontal section through the door and the jamb therefor, the section being taken practically on the line 2 2 of Fig. 1. Fig. 3 is an inner face view of the outer face-plate provided for the lock, or the plate which carries the knobs through the medium of which the combinations are set and worked. Fig. 4 is a side elevation of the lock proper, one of the plates of the casing having been removed and the bolt being shown in an inner position and as held from movement. Fig. 5 is a view similar to Fig. 4, the bolt being shown in its outer position. Fig. 6 is a horizontal section taken practically on the line 6 6 of Fig. 5. Fig. 7 is a vertical section through a door and the lock, the section through the lock being taken on the line 7 7 of Fig. 5; and Fig. 8 is a vertical section through a portion of the lock and the latch therefor, the section being taken substantially on the line 8 8 of Fig. 4.

A represents a portion of a door, B the jamb into which the latch and bolt of the lock are to enter, and C the casing for the improved lock, which is a mortise-lock. This casing, as is shown in Figs. 4, 5, and 6, consists of side plates 10 10^a, top, bottom, and end plates 11, and a front or face plate 12, which extends, preferably, beyond the top and bottom portions of the said casing. At the upper forward corner portion of the casing C a cam-lever 13 is pivoted at its outer or reduced end upon a post 14, secured to the casing, as shown in Fig. 8, and at the lower portion of the inner end of the cam-lever 13 a flange 15 is formed, as shown in Figs. 4 and 5. At the pivot end of the cam-lever 13 a downwardly-extending lug 16 is formed, provided with a pin 17, and this pin enters an opening 18 in a latch 19 of the ordinary construction and extending in the usual way through the face-plate 12. The latch 19 is guided in its movement by a sheath 20, secured to the face-plate

or front portion of the casing, the said sheath being U-shaped in cross-section, as is also shown in Fig. 8. A spring 21 is coiled around the post 14, and one end of this spring preferably has bearing against the top plate 11 of the lock-casing, while the other end of the spring has bearing against the inner face of the marginal flange 15 of the cam-lever, as shown in Figs. 4 and 5. This spring serves to normally hold the cam-lever in such position that the outer or beveled portion of the latch will be beyond the face-plate 12 of the lock-casing.

Just below the cam-lever 13 a spindle-sleeve 22 is journaled in the side plates 10 10^a of the casing and extends from one plate to the other, and this spindle-sleeve is provided with a finger 23, (shown best in Figs. 4 and 5,) and when the spindle-sleeve is turned so that the finger 23 is made to bear against the flange 15 of the cam-lever the cam-lever is forced upward, and consequently the latch 19 is drawn inward, and if the bolt D, to be hereinafter described, is in its inner position the door or object to which the lock is attached may be opened or released. The spindle which is passed through the spindle-sleeve 22 is of the usual construction and is provided at each outer end with a suitable knob 24.

The bolt D is held to slide from front to rear in the lock-casing C, the forward end of the bolt having support within a slot made in the face-plate 12 of the casing, through which the forward end of the bolt is adapted to pass, while the rear end of the bolt D is provided with a longitudinal slot 26, which receives a pin 27, attached to the casing C in any approved manner, and near the forward end of the bolt D a recess 25 is made in the upper edge of the bolt, the said recess being preferably substantially V-shaped, and slightly forward of the said recess 25 a pin 28 extends from one side of the bolt, as is shown in Figs. 4 and 5.

When the bolt D is free to have end movement, such movement may be imparted to said bolt by turning the spindle-sleeve 22 a sufficient distance to cause the finger 23 of the spindle-sleeve to play in the bolt-recess 25. As the finger 23 is moved outward the bolt is carried in that direction, and when the finger 23 is moved inward the bolt is drawn within the casing. After the bolt is drawn within the casing, by further turning the spindle-sleeve 22 in an inward direction the finger 23 of the said sleeve will engage with the cam-lever 13 and will draw inward the latch 19.

A latch-bar E is employed in connection with the bolt D. This latch-bar is located in front of the face of the bolt upon which the pin or stud 28 is secured and is pivoted at its inner end upon a suitable pin 29, attached to the casing at the rear of the inner end of the bolt D, and when the bolt is in its inner position this pin is received by the slot 26 in the bolt, as shown in Fig. 4. Ordinarily two

spacing-ribs 30 are formed upon the face of the latch-bar which is opposed to the bolt D, as shown in Fig. 6, and at the forward end of the latch-bar, which end is free to move up and down, a recess is produced having an inner inclined wall 31, which extends to the wall of a recess 32, produced in the upper edge of the latch-bar near its free or outer end, thus forming at the free or outer end of the latch-bar E a head 33. When the bolt D is in its inner position, the latch-bar E, which is controlled mainly by tumblers F, to be hereinafter described, is raised by one or more of said tumblers to such an extent that the pin 28 on the bolt D will enter the recess 32 in the latch-bar E, as shown in Fig. 4, and at this time the bolt D cannot be moved outward, being locked in its inner position. When the bolt has been carried to an outer or locking position, as shown in Fig. 5, the bolt may be locked in said position through the medium of one or more of the tumblers F, which will so raise the latch-bar E as to bring the head 33 back of the pin 28 on the bolt D. When the bolt is in this position, or when it is locked in its inner position, it cannot be freed from the outside, so that the spindle-sleeve can operate upon it until the tumblers F have been brought to a predetermined position; but means are provided, which means will be hereinafter described, for instantly releasing the bolt D from locking engagement with the latch-bar E from the inside of the door. When such means are employed, the latch-bar E will be lifted up at its free end until the head 33 of the latch-bar has cleared the pin 28 on the bolt D, and at this time the upper recessed portion of the latch-bar E will be around a portion of the spindle-sleeve 22. Consequently the spindle-sleeve may be turned by the spindle, and the finger 23 of the spindle-sleeve will operate the bolt to carry it within the casing.

The bolt is instantly released from the inside of the door in the following manner: A stud or projection 34 is formed upon what may be termed the "inner" face of the latch-lever E, preferably at a point near its center, and this stud or projection is adapted to be engaged by a releasing-lever 35, (shown best in Fig. 7,) which lever extends into the lock-casing through an opening 36 therein, and the said lever likewise extends to the opening 36 through an opening 37 made in the door, as is likewise shown in Fig. 7. This lever 35 is pivoted upon a projection located upon the outer face of a face-plate 38, which is secured to the inner face of the door, as shown in Figs. 6 and 7, it being simply necessary to press down on the outer end of the lever 35 to raise the latch-bar E when the bolt D is in locking position. The knob-spindle passes through this inner face-plate 38, and a corresponding face-plate 39 is secured to the outer face of the door, an inner face view of which latter plate is shown in Fig. 3.

It will be understood that one side plate of

the lock-casing C is preferably made removable, and the two side plates are connected by suitable screws or bolts 40, and bolts 41 are passed from one outer face-plate 38 to the opposing face-plate 39, and these bolts likewise preferably pass through the casing. Usually the front or outer face-plate 39 is provided with nuts 42 upon its inner surface to receive the threaded ends of the bolts 41, as shown in Figs. 3 and 7.

The tumblers F have rotary movement and are in the form of a disk 43, the disks being preferably more or less cupped, and a marginal portion 44 of each tumbler is made straight, so that when the straight edges of the tumblers are presented to the latch-bar E the said latch-bar can drop down to the position shown in Fig. 5, leaving the bolt free to be moved in and out of the casing; but if any one of the tumblers F is turned so as to present a cylindrical surface to the latch-bar E the latch-bar will be raised to its locking position with reference to the bolt D, as illustrated in Fig. 4. These tumblers F may be of the same size, or, as illustrated, the tumbler which is nearest the forward end of the latch-bar E may be of greater diameter than the others.

Any desired number of tumblers may be employed. Usually, however, two or three are sufficient, although more might be used. These tumblers F are loosely mounted on pins 45, and these pins are journaled at their ends in the plates 10 10^a of the casing C, as shown in Fig. 7. The solid faces of the tumblers F have bearing against shoulders 46, formed on the pins 45 by enlarging the forward ends of the said pins, and at the enlarged portions of these pins polygonal sockets 47 are formed, and the socket portions of the pins 45 extend beyond the outer face of the front plate of the lock-casing, as is also shown in Fig. 7. Washers 48 are secured on the pins 45 near the ends which turn in the inner plate of the lock-casing, and a spring 49 is coiled around each of said pins, having bearing against the washers 48 and against the tumblers F, the tension of the springs being sufficient to compel the tumblers to turn with the pins 45 under ordinary circumstances.

The sockets 47 of the pins 45 are adapted to receive polygonal shanks 50, which are mounted to turn in suitable openings in the front or outer face-plate 39, and at the outer end of each shank 50 a knob 51 or its equivalent is secured. Between the knobs and the outer face-plate 39 washers 52 are usually interposed.

A circular group of depressions 53 is produced in the inner surface of the outer face-plate 39 around each shank 50, as is particularly shown in Fig. 3. These depressions are preferably circular in character and are at uniform distances apart; but a wide space 54 occurs at a point between opposing depressions in each group, as is also shown in Fig.

3. Spring-tongues 55 are provided to enter the depressions 53, and these tongues preferably form portions of arched spring-plates 56, which are firmly secured to the shanks 50, and the plates 56 likewise have bearing against the inner surface of the outer face-plate 39.

In selecting a combination one knob may be designated, for example, as "3," its pointer 55 being adapted in the operation of the knob to pass from the first to the third depression 53, adjacent to the shank of that knob. The next knob may be designated as "2," for example, its pointer 55 being adapted to pass to the second depression from an end of the group belonging to that knob, while the third knob may be designated as "5," and the pointer 55 belonging to that knob must be carried to the fifth depression in that particular group. When the pointers have been thus placed with relation to the depressions 53, the flat faces of the tumblers will be uppermost, and the latch-bar E for the bolt D may then drop, as shown in Fig. 5, and the bolt can be operated by the spindle of the lock in the manner heretofore described. After the bolt D has been carried out a predetermined distance from the casing C any one of the knobs may be turned so as to bring the curved surface of the tumbler carried by the spindle of that knob to an upper position, and thereby raise the latch-bar E and bring the head of the said latch-bar at the rear of the projection 28, formed on the bolt D. The bolt can then not be carried inward until the pointers 55 have been set to the combination agreed upon, which will bring the flat surfaces of the tumblers to an upper position.

Numerals or other characters need not be produced upon the outer surface of the face-plate 39 adjacent to the knob to indicate the extent to which the knobs shall turn, since by turning any knob completely around the pointer 55 belonging to that knob will reach a plain surface 54 between the depressions 53, arranged around the shank of that knob. The operator can now feel that the pointer is passing a smooth surface, and this smooth or plain surface corresponds to zero in other forms of combinations. When the knob is further turned, as soon as the pointer reaches the first depression it snaps therein, and should the operator not catch the sound produced by this operation the operator will feel that the pointer has dropped into the depression, thus knowing that the first point has been reached. The knob is then turned to the next depression, and when it is reached a similar action takes place, giving warning by sound and by feeling. The knob is thus continued to be turned until the proper number of points have been reached in that particular group of depressions. Therefore a person can open a safe-door or an ordinary door at night as conveniently as in daytime when the door is provided with the improved lock.

The combination can be changed at any

time in a very simple manner and as follows: The bolt D is not forced out to the same extent as when the door is to be locked, but is carried out only until the line 57 (shown in Figs. 4 and 5) registers with the outer face of the face-plate 12. The latch-bar E will now rest upon the plain or flat surfaces 44 of the tumblers, and the latch-bar will be prevented from rising, because of the pin 28 of the bolt being brought over the head 33 of the latch-bar, and consequently the tumblers cannot turn. The knobs are then turned until the pointers 55, carried by the knobs, have been brought to the desired depressions 53. Thus, for example, the pointer of the first knob may be carried to the second depression, the pointer of the second knob to the fourth depression, and the pointer of the third knob to the seventh depression, making the combination read "2," "4," "7." It will be observed that by reason of the tumblers being frictionally held on the pins 45 by the springs 49 the pins may be turned while the tumblers remain stationary, provided the tumblers are locked. When the latch-bar E, however, is free to move up and down, the tumblers will at all times turn with the pins upon which they are mounted.

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

1. In a lock, a bolt, means for operating the bolt, a latch for locking the bolt, rotary tumblers controlling the latch, devices for operating the tumblers from the outside of the lock, and a releasing device operated from the inside of the lock, for throwing the latch into its inactive position, independently of said tumblers, said device consisting of a lever fulcrumed on the lock-casing and arranged to engage the latch from below, to lift it out of engagement with the bolt.

2. In a lock, a bolt, means for operating the bolt, a latch-bar for the bolt, tumblers in operative engagement with the latch-bar, knobs arranged to operate the said tumblers, being located at the exterior of the lock, concealed pointers carried by the extensions from the knobs, and a face-plate having concealed depressions into which the pointers are adapted to enter, as described.

3. In combination - locks, a face - plate,

shanks held to turn in the said face-plate, said face-plate being provided with groups of depressions around each shank, and spring-pointers carried by the shanks, arranged to enter the said depressions, for the purpose set forth.

4. In a combination - lock, a face-plate, shanks held to turn in the face-plate and operated from the exterior thereof, the face-plate having groups of depressions in its inner face arranged around said shanks, the arrangement of each group of depressions being in the arc of a circle, a wide space intervening between the end depressions of each group, and spring-pointers carried by the shanks, and adapted to engage with the inner face of the face-plate and to enter the said depressions, for the purpose set forth.

5. In a lock, a spring-latch, a bolt, and a spindle-sleeve arranged to operate both the latch and the bolt, a latch-bar for the said bolt, rotary tumblers controlling the movement of the latch-bar in one direction, said tumblers being operated from an exterior portion of the lock, and a trip device exteriorly located at the opposite side of the lock and arranged to carry the latch-bar from the said tumblers when the bolt is in locked position, for the purpose specified.

6. In a lock, the combination, with a casing, a bolt held to slide in the casing and provided with a lug near its outer end, and means for operating the said bolt, of a latch-lever pivoted at one end and having a recess and a head at its free end, both of which are adapted to act in conjunction with the lug of the said bolt, rotary tumblers consisting of disks having flat surfaces, which tumblers are adapted for peripheral engagement with the latch-bar, acting to operate the said latch-bar, and means for moving the said tumblers a predetermined distance, the said tumblers being operated from the exterior of the said lock, as and for the purpose specified.

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

OSCAR KATZENBERGER.

Witnesses:

GEO. F. STUEMKE,
OSCAR B. B. SMITH.