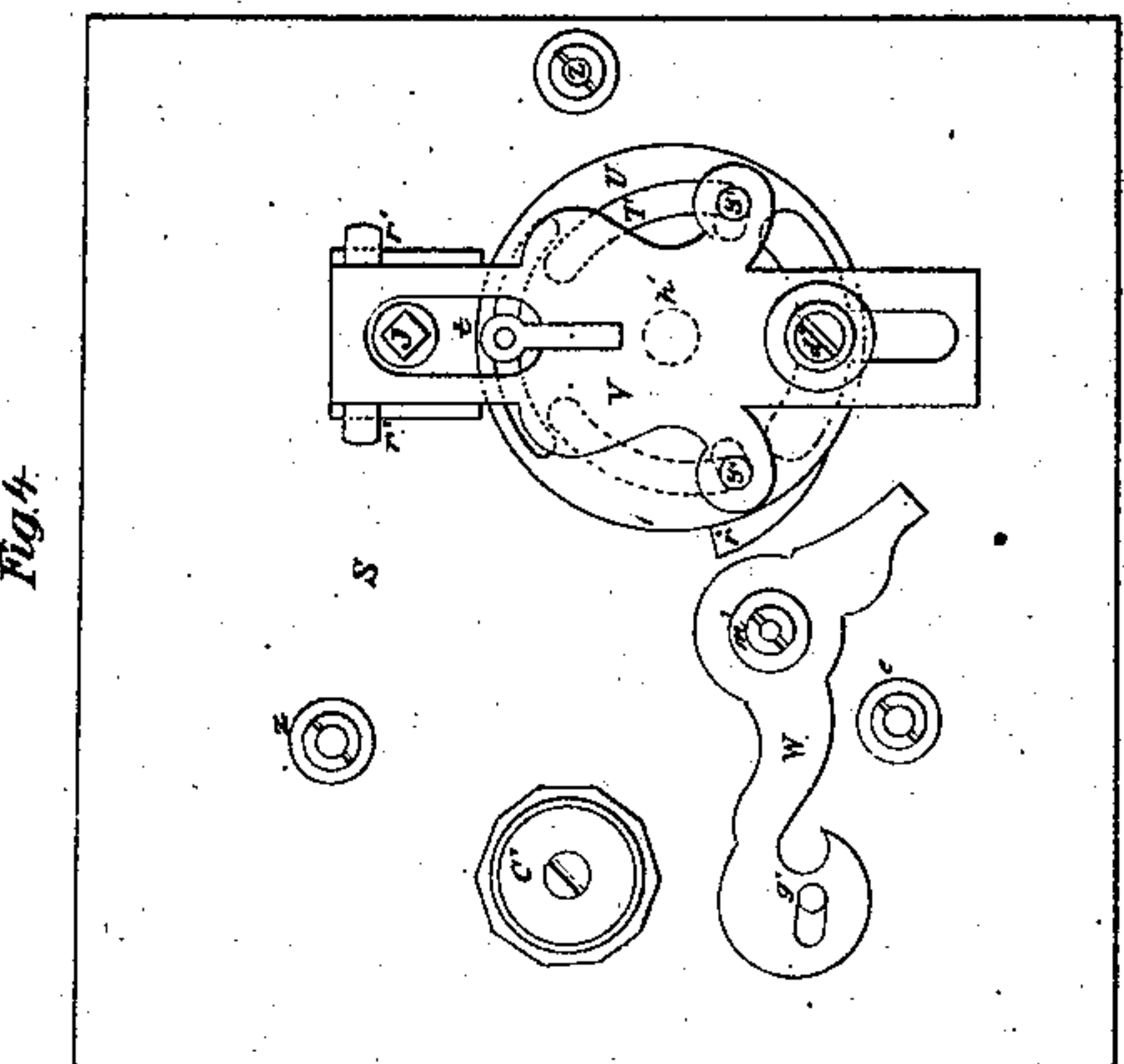
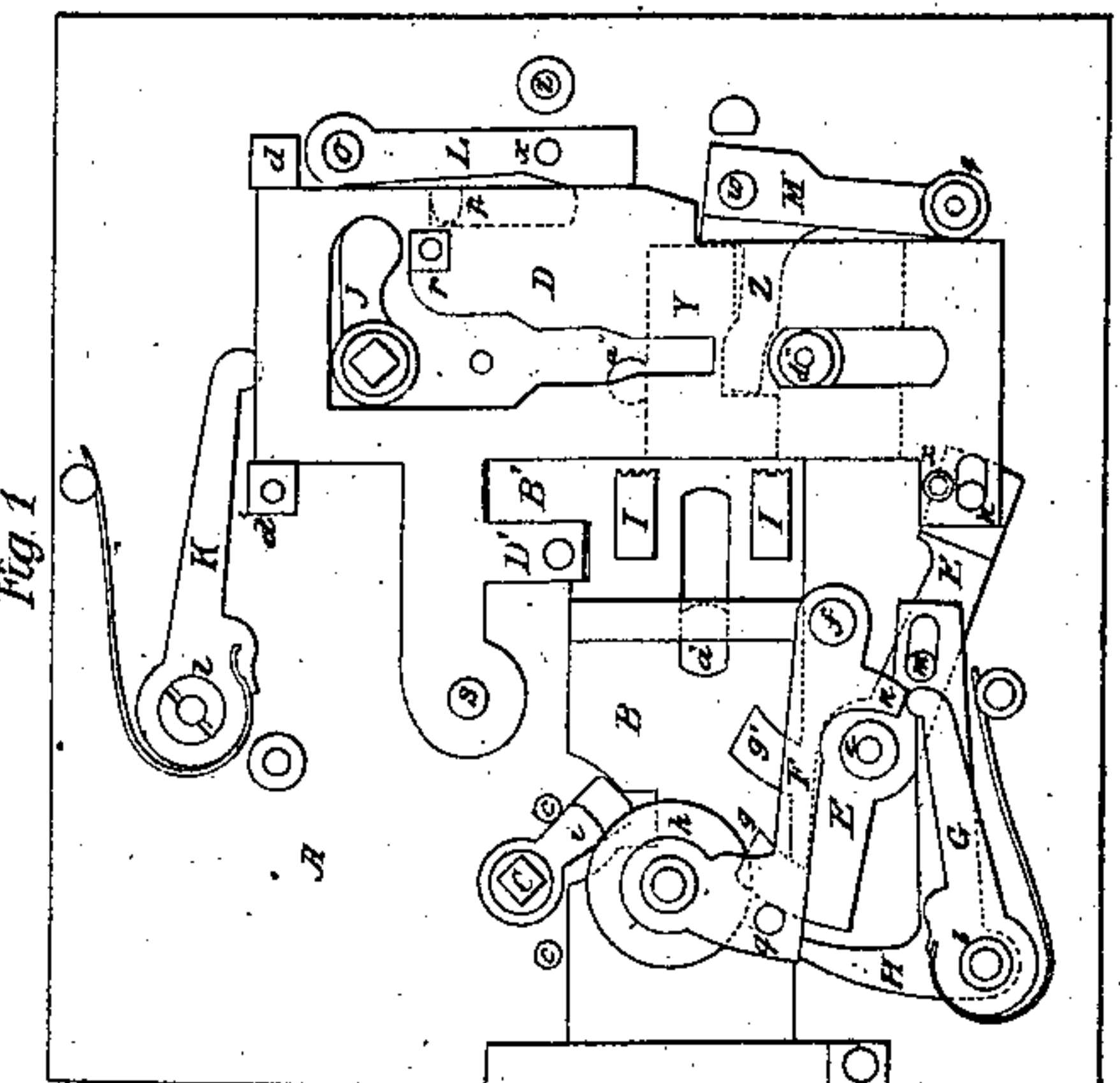
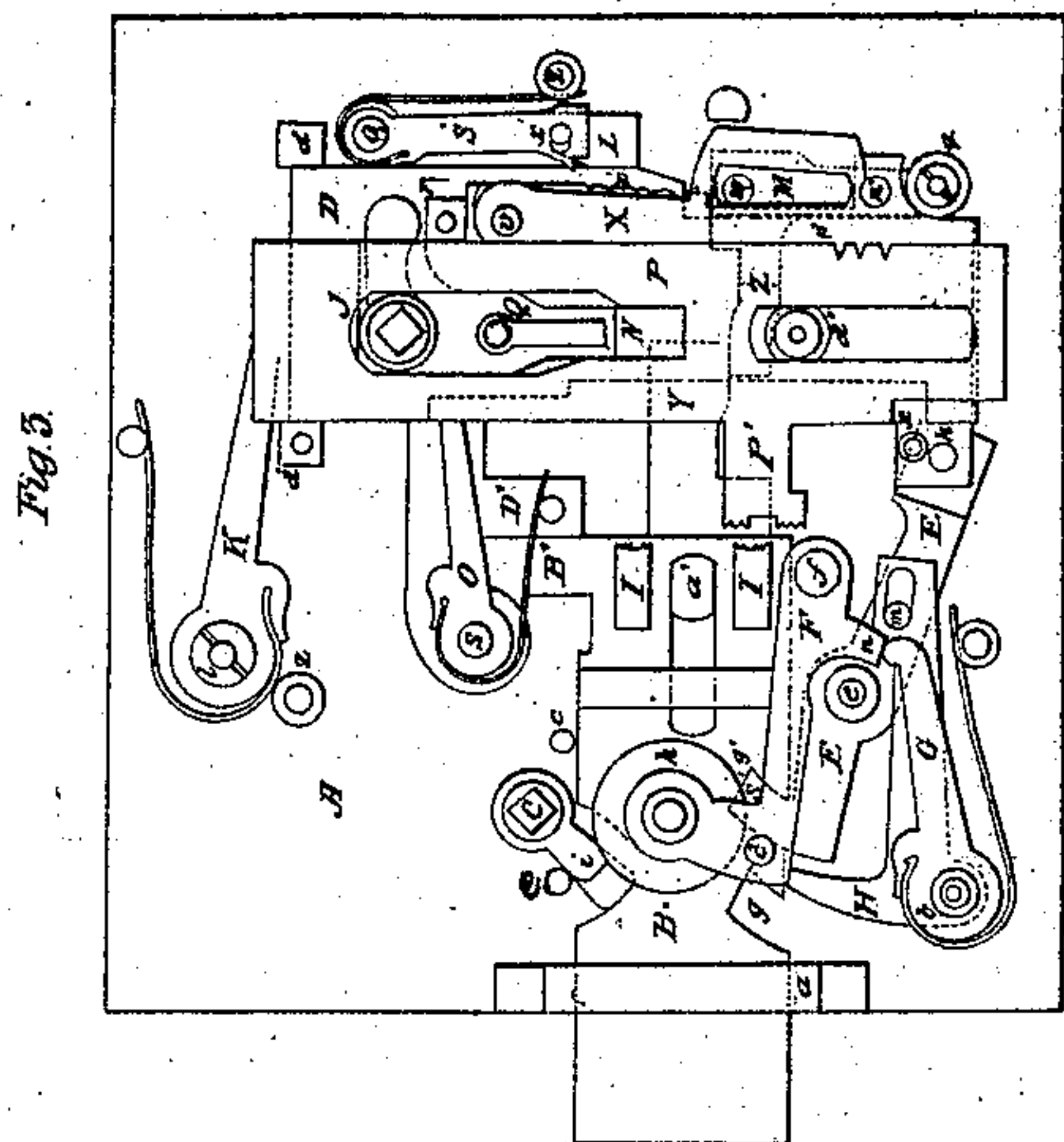
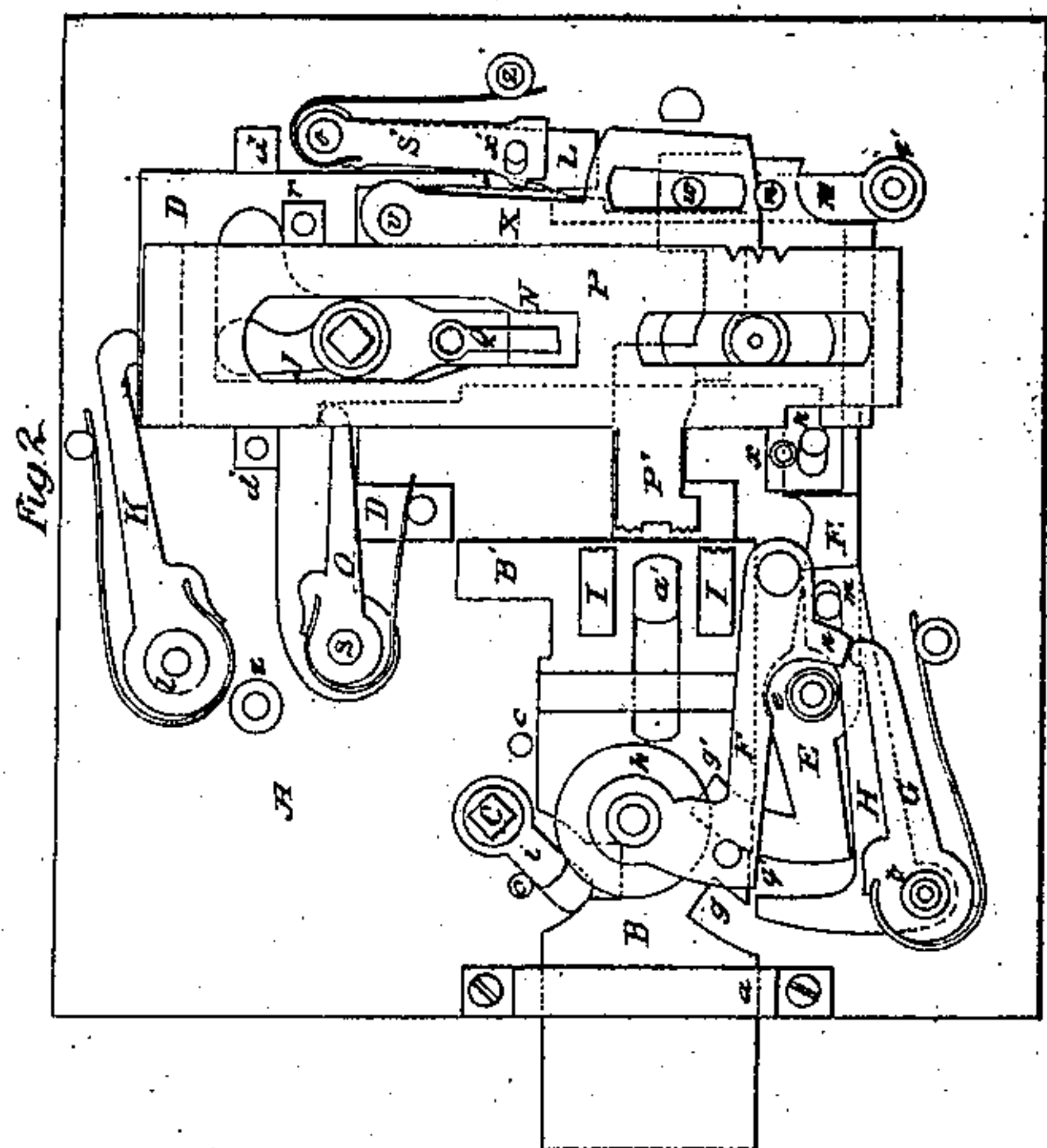
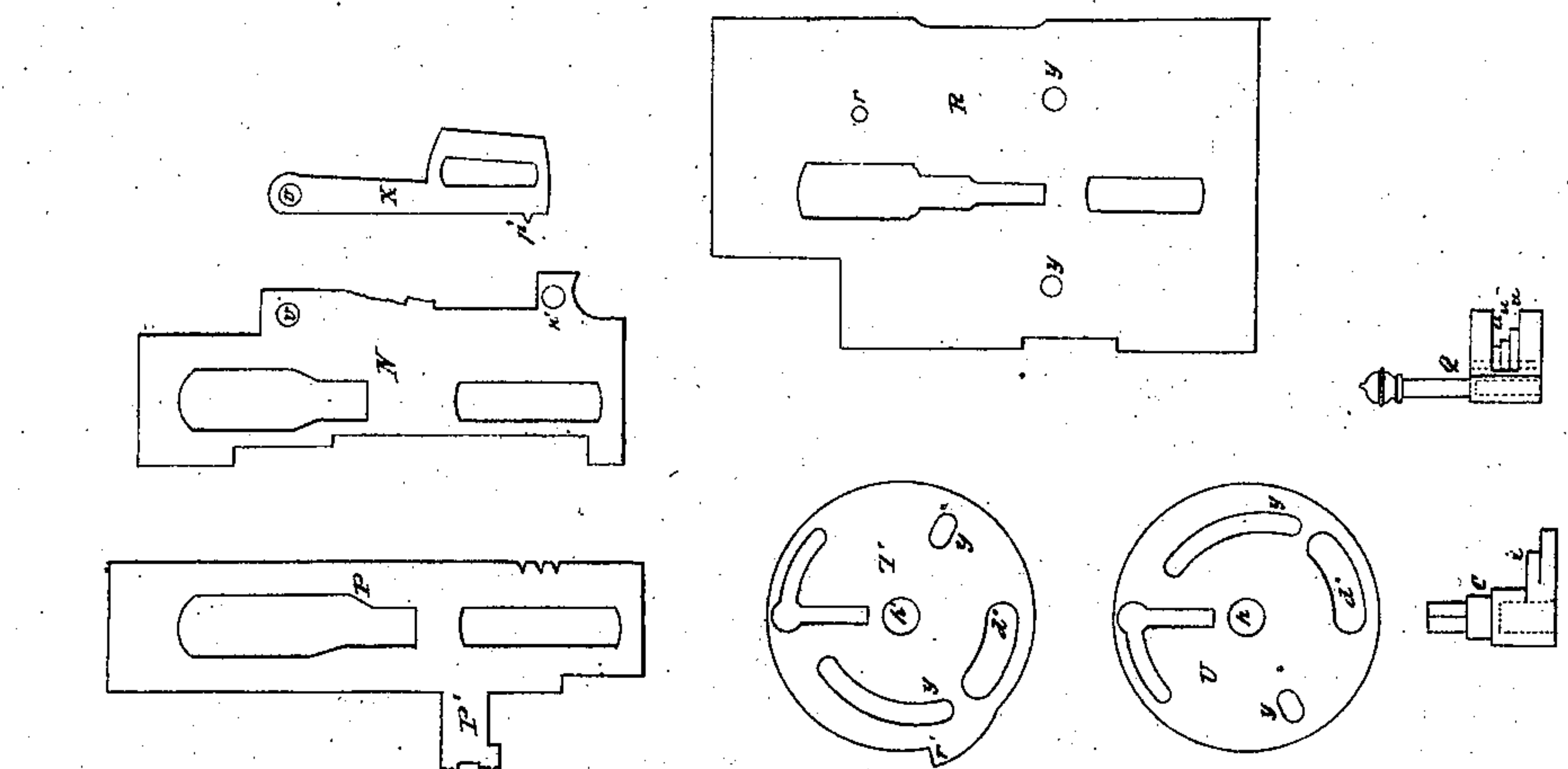


F. Denzler,

Lock,

No 12,403,

Patented Feb. 20, 1855.



Inventor
F. Denzler

UNITED STATES PATENT OFFICE.

FREDERICK DENZLER, OF NEW YORK, N. Y.

BANK-LOCK.

Specification of Letters Patent No. 12,403, dated February 20, 1855.

To all whom it may concern:

Be it known that I, FREDERICK DENZLER, of New York, State and county of New York, have invented a new and Improved Bank-Lock; and I do hereby declare that the following is a full and exact description thereof, reference being had to the accompanying drawings, and to the letters of reference marked thereon.

10 The nature of my invention consists in the construction of a lock with a tumbler key, in which the key does not turn any of the parts in the inside of the lock, through which the bolt is held fast or set at liberty, 15 but is only for the purpose of regulating and stopping the internal tumblers at the required position, to liberate the bolt, that the same may be pushed in or out as desired. By this arrangement I am able to reduce the 20 size of the key considerably as the same is not subjected to any strain, making said key convenient to be carried in the pocket or the portemonnaie without loosing any of the advantages derived from those kinds of locks 25 and keys, on account of the possibility of being subject to any amount of changes, according to the number of tumblers in the lock, and bits in the key.

30 In the accompanying drawings Figure 1 represents the inside of the lock, in a position when the bolt is pushed in, with the top lock plate, the tumblers, and tumbler plates with their appurtenances removed. Fig. 2 35 represents the inside of the lock, with the top plate removed, with one tumbler and plate, &c., and all parts in a position to leave the bolt at liberty. Fig. 3, represents the same parts of the lock as Fig. 2, with all parts in a position to lock the bolt. Fig. 4, 40 represents the outside of the lock. The remaining figures represent different parts of the lock separately.

Similar letters refer to similar parts.

45 (A) is the back plate of the lock, to which the different centers are attached, for the guides for the bolt (B) and for the main slide D. (B) is the bolt of the lock, guided by the guides (*a*, *a'* and *a''*), fast to the 50 back plate.

(C) is the fallar, turning upon a center fast to the back plate (A), and provided with a knob (C'), projecting through the outside of the lock and the door, and by 55 which the bolt (B) is pushed in or out.

(*e*, *e*) are stops for the fallar (C). (D)

is the main slide, guided by the projections (*d*, *d'* and *d''*), fast to the back plate. To the lower part of this slide is the one end of the dog (E) attached, turning on a center 60 (*e*) fast to the back plate. By this connection, any motion given to the slide (D) is communicated to said dog (E). When the slide (D) is down, as represented in Figs. 1 and 3, the bolt (B) is held fast by the pro- 65 jection (D'), of the slide (D), lying against the projection (B') of the bolt (B), and by the dog (E) fitting in the notch (*g*) at the lower side of the bolt (B), but if the slide (D) is moved upward, as represented in 70 Fig. 2 the projection (D') of the slide, and the dog (E) are brought clear of the projection and notch of the bolt (B), allowing said bolt to be pushed in or out of the lock by the fallar (C), except said bolt is held 75 by any other part of the lock.

(F) is a lever, turning upon a center (*f*) fast to the back plate, and provided with a roller (*h*), bearing against a projection (*i*) on the fallar (C). 80

(G) is a spring lever, turning upon a center (*g*), and bearing against a projection (*n*) on the lower side of the lever (F), forcing the latter, by its action, upward, so that the roller (*h*) of said lever presses or 85 bears always against the projection (*i*) on the fallar (C).

(H) is a dog, turning upon the center (*h*), and connected at one end with a pin (*m*) fast to the dog (E), receiving thereby 90 a corresponding motion from said dog (E). The other end of the dog (H) is so constructed as to bear against the underside of the lever (F), when in the position represented in Figs. 1 and 3, or in other words, 95 when the main slide (D) is down and holding the bolt (B) locked, thereby preventing the lever (F) being pressed downward by the projection (*i*) of the fallar (C), and consequently preventing said fallar (C) be- 100 ing moved. By the motion given to the dog (H), through the dog (E), said dog (H) is brought clear of the lever (F), as represented in Fig. 2, and the fallar (C) can then be turned, being then capable of pushing 105 the lever (F) away, as said lever (F) is now only held up by the action of its spring lever (G). (J) is a fallar, turning upon a center fast to the back plate (A), and projecting through the outside of the lock and 110 the door, and provided with a knob or a key to turn the same by, and by which the

main slide (D) is raised up. (K) is a spring lever, turning upon a center (*l*) fast to the back plate (A), and bearing against the top of the main slide (D), pressing the same
 5 always downward, as soon as relieved of the action of the fallar (J). (L) is a lever, turning on a center (*o*), fast to the back plate and provided with a small projection (*p*), fitting in a slot on the underside of the
 10 slide (D), and so arranged as to receive motion from the slide (D), as soon as said slide is moved. (M) is a lever, turning upon the center (*q*) fast to the back plate (A), and provided with a nose (Z), corresponding
 15 with a projection (Y), fast to the end of the bolt (B), and through which said lever (M) receives a slide motion. (N) is a tumbler, guided by the projections (*d'* and *d''*) fast to the back plate (A), and by the projection
 20 (*r*) fast to the main slide (D). This tumbler (N) rests upon the slide (D), and is kept up by a spring lever (O) turning on the pin (*s*) fast to the slide (D). Through the action of this spring lever (O), said tum-
 25 bler (N) is made to move always with the slide (D), except when the action of the spring lever (O) is counteracted by one of the bits (*u*) of the key (Q) coming in contact with the tumbler (N), when said tum-
 30 bler (N) is stopped, and the slide (D) moves up along the remaining distance. (X) is a catch, turning on a center (*v*) fast to the tumbler (N), and guided by a projection (*n'*) likewise fast to the tumbler (N). This
 35 catch (X) being attached to the tumbler by the pin (*v*), moves consequently the same distance as the tumbler. On the lower end of this catch is a small tooth (*p'*) cut on, as well as a suitable slot made, into which a
 40 pin (*w*), attached to the lever (M), fits.

(P) is a tumbler plate, lying upon the tumbler (N), and guided, when moving, by the same projections which guide the tumbler. On the fore side of the tumbler plate
 45 (P) is a projection (P'), which fits between two projections (I, I) fast to the bolt (B), when said bolt (B) is pushed in. On the back side of this tumbler plate (P') are teeth cut in, corresponding with the tooth
 50 cut on the catch (X), and corresponding in number to the number of tumblers which are placed into the lock.

When the bolt (B) is pushed out (Figs. 2 and 3) the projection (P'), of the tumbler
 55 plate (P), comes out from between the projections (I, I) of the bolt (B), and if said bolt (B) requires to be pressed in again, the tumbler plate (P) must consequently be again in exactly the same position the same
 60 was in, when the bolt (B) was pressed out, otherwise the projections (P') of the tumbler plate (P') will come against either of the projections (I, I) of the bolt (B), preventing thereby said bolt (B) from being
 65 pushed inward.

(Q) is the key, having a number of bits (*u, u*) attached to it, in such a manner that the relative position of said bits to each other may be changed. The number of bits
 70 depending and corresponding with the number of tumblers in the lock. This key fits open a drillpin (*t*) fast to the back plate (A), and remains perfectly steady after being placed in the lock, being only for the
 75 purpose of stopping the tumblers in the different positions, according to the length of the corresponding bits of the key. As this key is not required to turn or to move any of the different parts of the lock, and consequently is not subject to any strain, the
 80 same may be made very small and light, and only sufficiently long to project through the lock and the door, making the same therefore convenient to be carried in the pocket, besides reducing the keyhole con-
 85 siderable.

(R) is a plate, attached to the slide (D) by the pins (*r* and *x*) fast to said slide, and likewise guided by the projection (*d''*). This plate moves with the slide (D) and
 90 covers up all the tumblers, tumbler plates, &c., lying between the same and the slide (D), and is provided with a suitable opening for the key and the fallar (J) to pass through.
 95

(*y, y*) are pins, fast to the plate (R), and projecting through suitable openings to the outside of the top plate (S) of the lock.

(S) is the top plate of the lock, by which all internal arrangement is covered up, and
 100 secured to the back plate (A) by the pins and nuts (*z, d''* and *c*).

(T) is the lower top tumbler, and (U) is the upper top tumbler, turning on a center (*h'*) fast to the top plate (S) and connected
 105 with the plate (R), through the pins (*y, y*).

(V) is the top slide, likewise connected through the pins (*y, y*) with the plate (R), and guided by suitable projections (*r'*) fast to the top plate (S), and by the pin (*d''*)
 110 which passes through the top plate. Through the connection of the top tumblers (T and U) and the top slide (V) with the plate (R) by means of the pins (*y, y*), motion is communicated to said top tumblers
 115 and top slide, and which are so constructed, that by the least motion, the key hole of the lock, with the exception of that part where the shank of the key projects through, is immediately covered up by said parts, pre-
 120 venting thereby any access being had to the inside of the lock through the key hole, except when the slide (D), from which they receive their motion, is quite down.

(W) is a lever, turning on a center (*m'*)
 125 fast on the top plate (S), one end of which is connected with a pin (*q'*) fast to the lever (F), and projecting through the top plate, and the other end is so arranged, as to pass within the inside of the projection
 130

(*r'*) on the lower top tumbler (T), as soon as motion is communicated to said lever (W) through its connection with the lever (F). By this arrangement the bolt (B) must always be pressed in or out the whole length before the top tumblers (T and U), and consequently the slide (D) can be moved, thereby preventing any possible disarrangement of the lock.

The operation of the lock is as follows. If the bolt (B) is inside of the lock, the bits (*u, u*) of the key (Q) may be placed in any position desired to each other, then put the key upon the drill pin (*t*) in the key hole, and turn the fallar (J), until the slide (D) is quite lifted up. By this motion the projection (D') of the slide (D), has come clear of the projection (B') of the bolt (B), and the dog (E) has been moved out of the notch (*g*) of the bolt (B), and the dog (H) has been moved in such a position that the lever (F) can be pushed downward, being only held up by the spring lever (G). The bolt (B) is therefore now at liberty and can be pushed out. By this upward motion of the slide (D), the tumbler (N) has been carried up with the same, through the action of its spring lever (O), until said tumbler comes in contact with one of the bits (*u*) of the key (Q), by which the tumbler is now stopped, while the slide (D) finishes the remainder of the whole motion. The catch (X), which is attached to the tumbler (N), has moved up with said tumbler, and the tooth (*p'*) at the end of this catch has been brought exactly opposite one of the teeth at the back of the tumbler plate (P). If the bolt (B) is now pushed out, through the fallar (C), the projection (Y), at the back of the bolt, has moved the lever (M) in such a manner, that through the same, the catch (X), which is connected to said lever (M), is pushed against the tumbler plate, so that its tooth falls into one of the teeth of the tumbler plate locking thereby the same to the tumbler (N), as represented in Fig. 2, and the projection (P') of the tumbler plate (P) has come out from between the projections (I, I) of the bolt (B). If the fallar (J) is now turned again, so as to allow the slide (D) to be pressed down by its spring lever (K), carrying with it the tumblers (N) with the tumbler plates (P), locked to the same by the catch (X), the projection (D') of the slide (D) comes again against the projection (B') of the bolt (B), and the dog (E) is moved into the notch (*g'*) of the bolt (B), keeping thereby said bolt (B) fast. The dog (H) has thereby been likewise moved under the lever (F), preventing said lever being pushed away by the projection (*i*) on the fallar (C), and prevents consequently said fallar from being moved. The top tumblers (T and U), as well as the top slide (V), have by this motion been

brought in a position to leave the key hole open, when the key can be taken out again, when the lock is locked, and perfectly secure, and can not again be opened, except the key is put again into the key hole, with the bits (*u, u*) arranged exactly in the same manner and position they were in, when the bolt was pushed out, as the tumblers (N) as well as the tumbler plates (P) must be stopped, when the slide (D) is moved upward, in exactly the same position the same wherein, when the bolt (B) was pushed out, to allow the projection (P') of the tumbler plate (P), to pass between the projections (I, I) of the bolt (B). If the key (Q) is therefore not first inserted, or if the same or any substitute is inserted with the bits (*u, u*) in a different position or of different length as before, the tumblers (N) and tumbler plates (P), which by the upward motion of the slide (D) are carried up with the same, will then be stopped in a different position, and the bolt (B) will consequently be prevented from being pushed in, by the projections (P') of the tumbler plate (P) coming in that case against either of the projections (I, I) of the said bolt (B). It will readily be understood that almost any number of tumblers with their corresponding tumbler plates, &c., can be put into a lock, and consequently the larger the amount of the same, the more difficult it will be to find the exact position each tumbler with its corresponding tumbler plate must occupy.

By the arrangement of the top tumblers (T and U), and the top slide (V), the access to the inside of the lock, through the key-hole, is made still more difficult, and besides this, the tumblers and tumbler plates are all made of different length and shape, where it is possible to make them such, so as to prevent any exact measurement being taken. If by any means the top slide and top tumblers should be forced away, for the purpose of picking the lock, the person engaged in that business will have to move first the slide (D) upward, for the purpose of bringing the same, as well as the dog (E), clear of the bolt, and at the same time bringing the tumblers and tumbler plates before the key-hole. Now he must begin to move the first tumbler with its corresponding tumbler plate, by means of a hook or any other instrument downward, until he believes the same to be in its right position, and then do the same with the second, and so on to the last one.

On the back of the tumblers (N) are small irregular teeth (*w'*) cut. A spring lever (S'), with one tooth at its end, is attached to the center (*o*) of the lever (L), and moves freely on the same, and is connected with a pin (*x'*) fast to the said lever (L), in such a manner as to allow a free action of said spring lever, but to have any motion

given to the lever (L) communicated to the
spring levers (S'). By this arrangement of
said spring lever (S') fitting into the teeth
at the back of the tumblers (N), said tum-
5 bler with its tumbler plate can only be
moved downward the distance of one tooth,
where it will be kept by said spring lever
(S'), and as those distances, as before men-
0 tioned, are very irregular the chances are
therefore very much against finding the
exact position of all, so that the projections
(P') of the tumbler plates (P) will all pass
between the projections (I, I) of the bolt
(B), for the purpose of allowing said bolt
5 to be pushed in. If only one should be too
far downward, there is no way to get the
same up again, being held down by its cor-
responding spring lever (S'). By the least
motion of the slide (D) the lever (L) will
0 be moved outward, taking the spring lever
(S') with it, so as to bring the same clear
of the teeth in the tumblers, which will then
immediately be pressed up again, by their

corresponding spring levers (O) into their
uppermost position, and the person attempt- 25
ing to pick the lock has to begin again at
the beginning. The top tumblers (T and U)
and the top slide (V), may likewise be
placed below the top plate (S), and the plate
(R) may likewise be so constructed as to 30
cover up the keyhole, as soon as moved up-
ward through the slide (D).

What I claim as new and my invention
and desire to secure by Letters Patent con- 35
sists in—

The lever (F) in connection with its
spring lever (G), together with the dog (H)
acting upon the lever (F), said dog (H) be-
ing actuated by the dog (E) for the purpose
of preventing the fallar (C) from being 40
turned.

FREDERICK DENZLER.

Witnesses:

HENRY E. ROEDER,
LOUIS FROCH.