

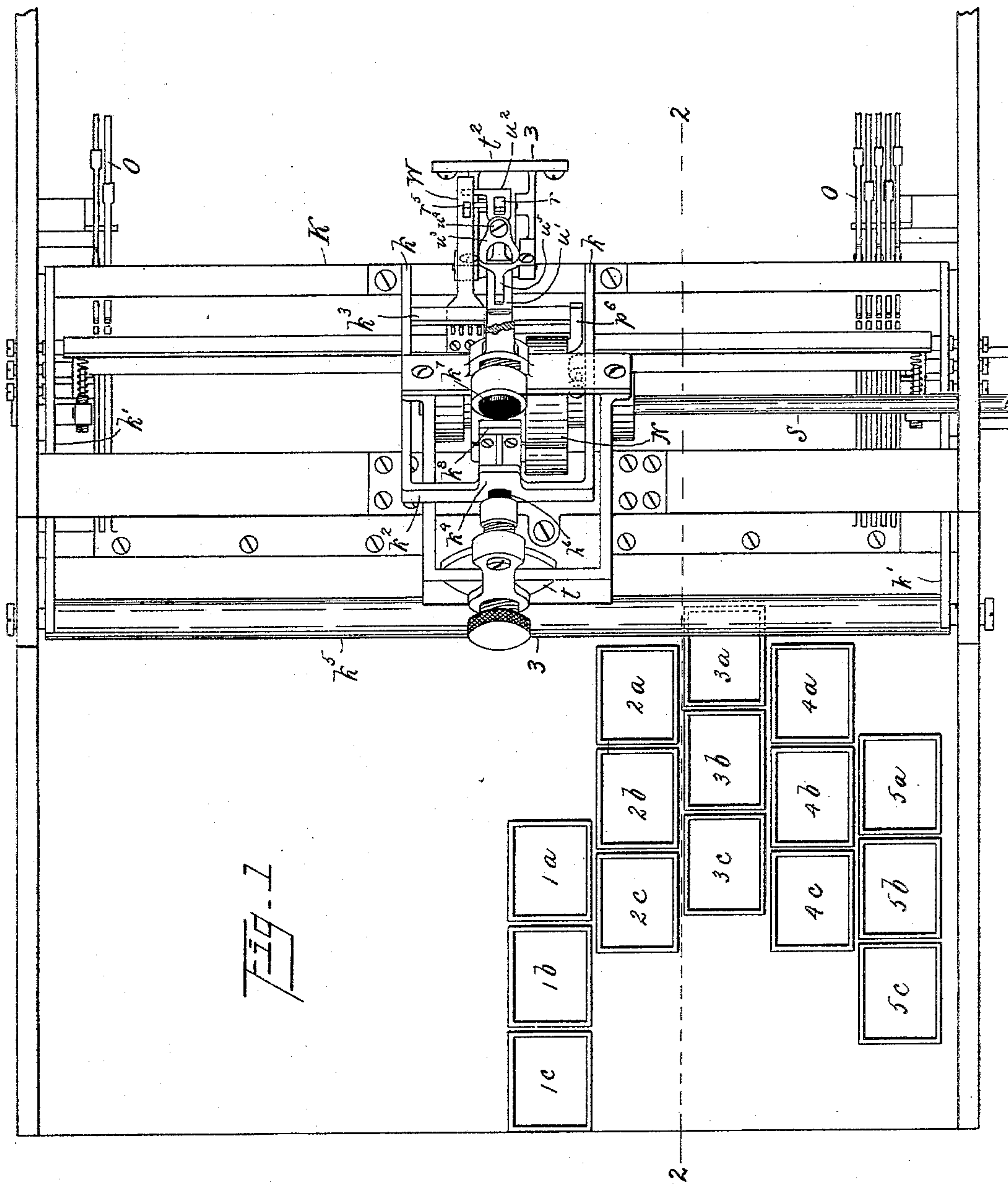
(No Model.)

3 Sheets—Sheet 1.

E. B. KIRBY.
KEYBOARD FOR TYPE WRITING MACHINES.

No. 597,776.

Patented Jan. 25, 1898.



Witnesses.

L. Griswold
Helen M. Hutchison

Inventor.

Edmund B. Kirby
By *E. L. Thurston*
his attorney

(No Model.)

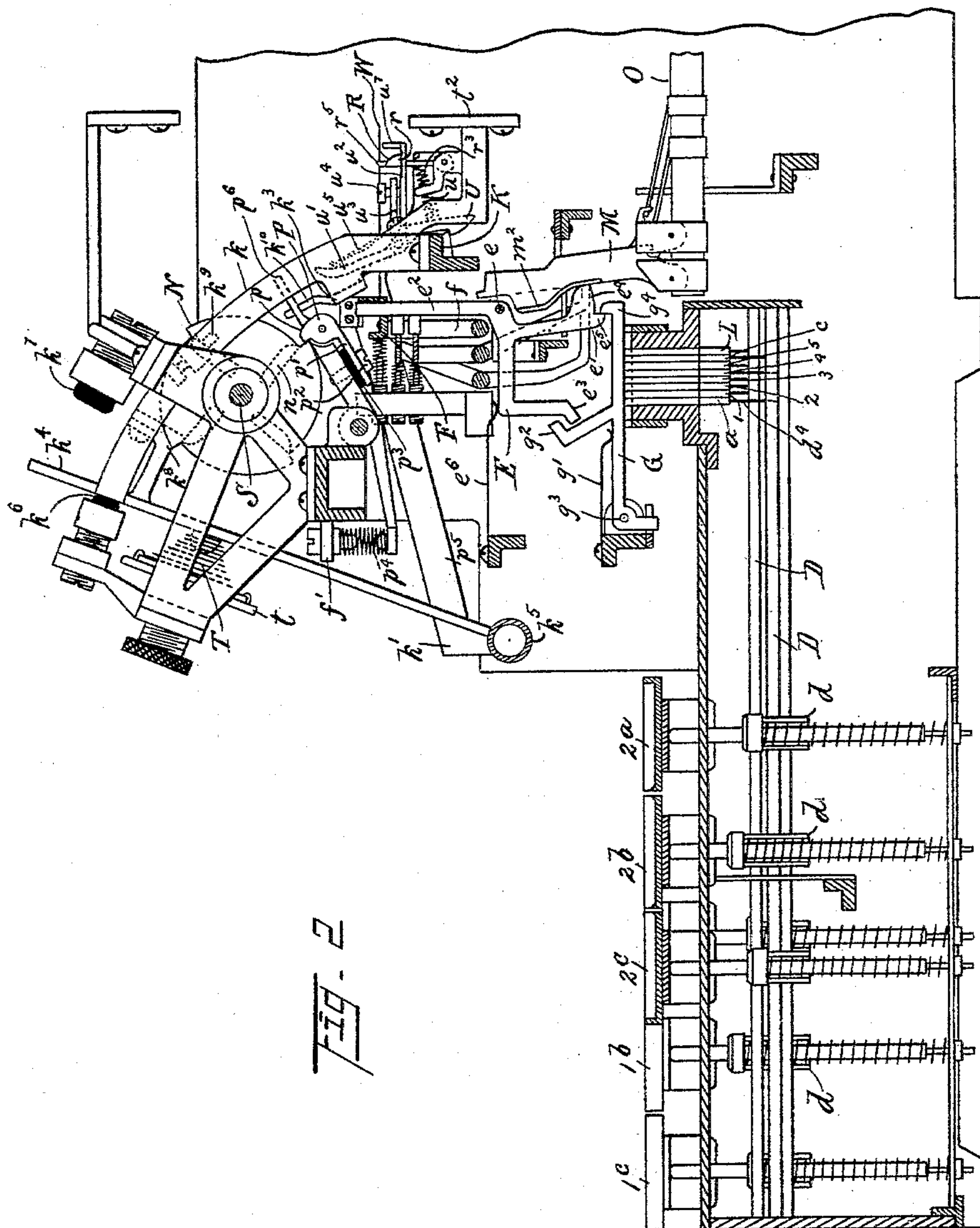
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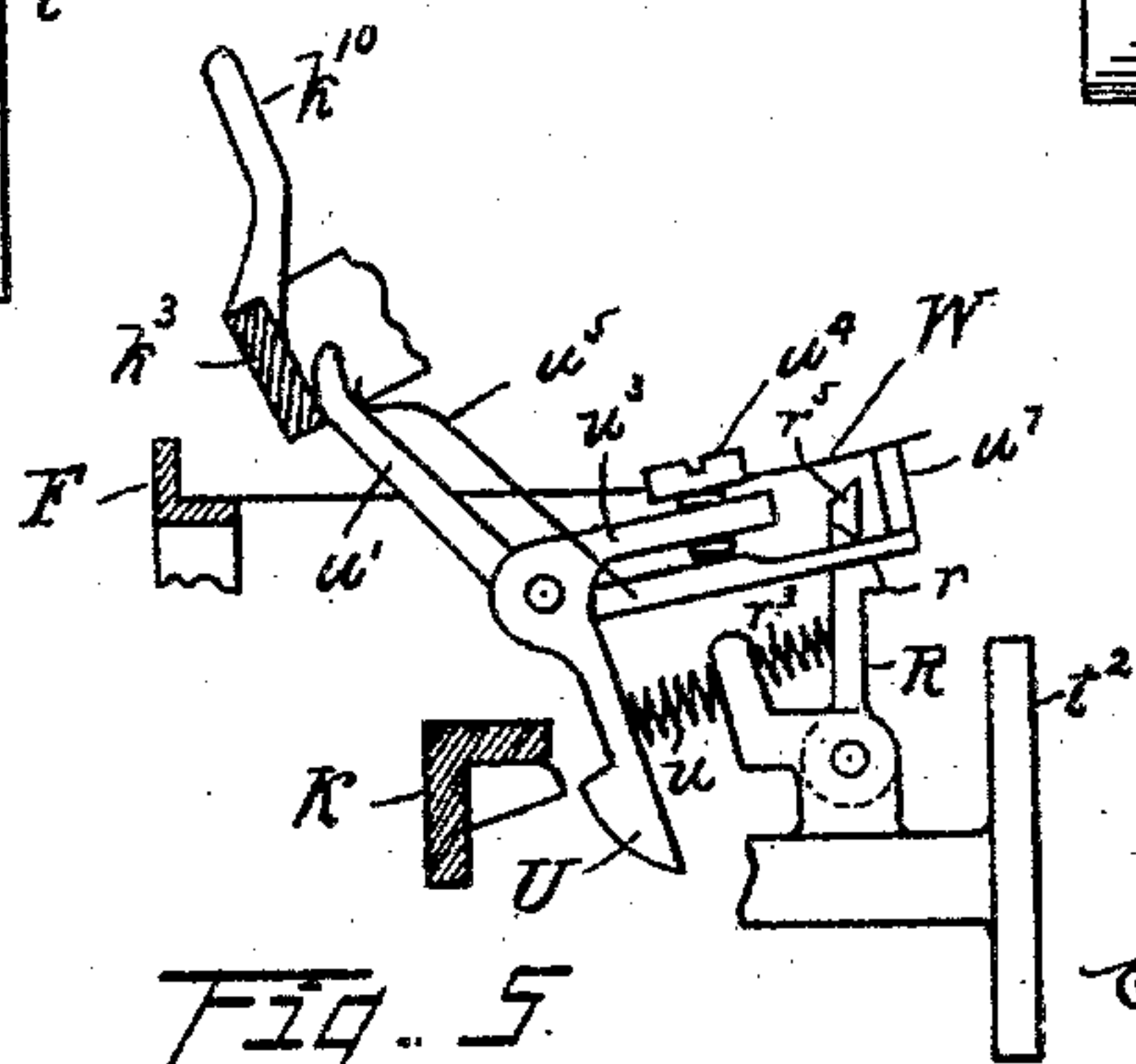
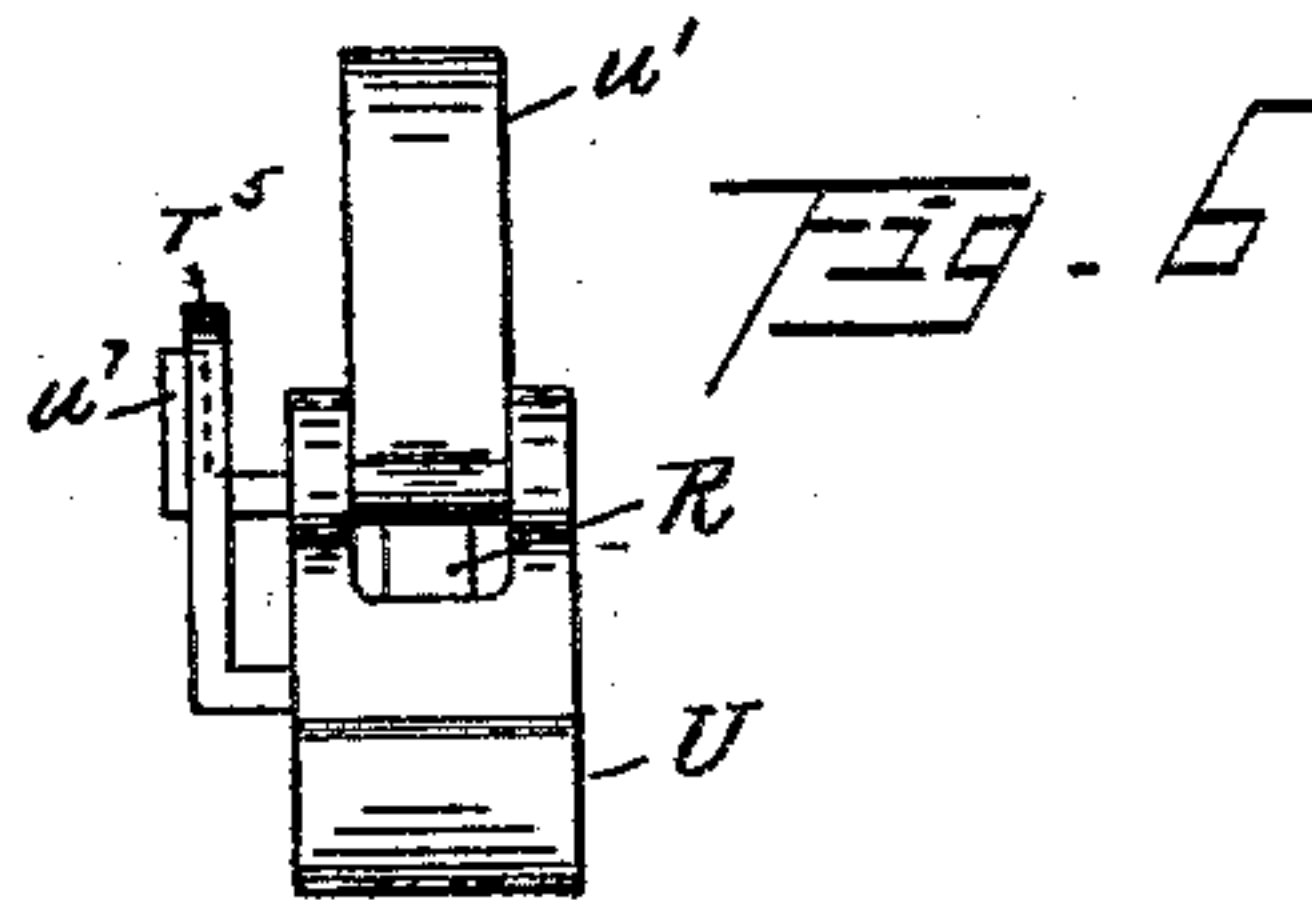
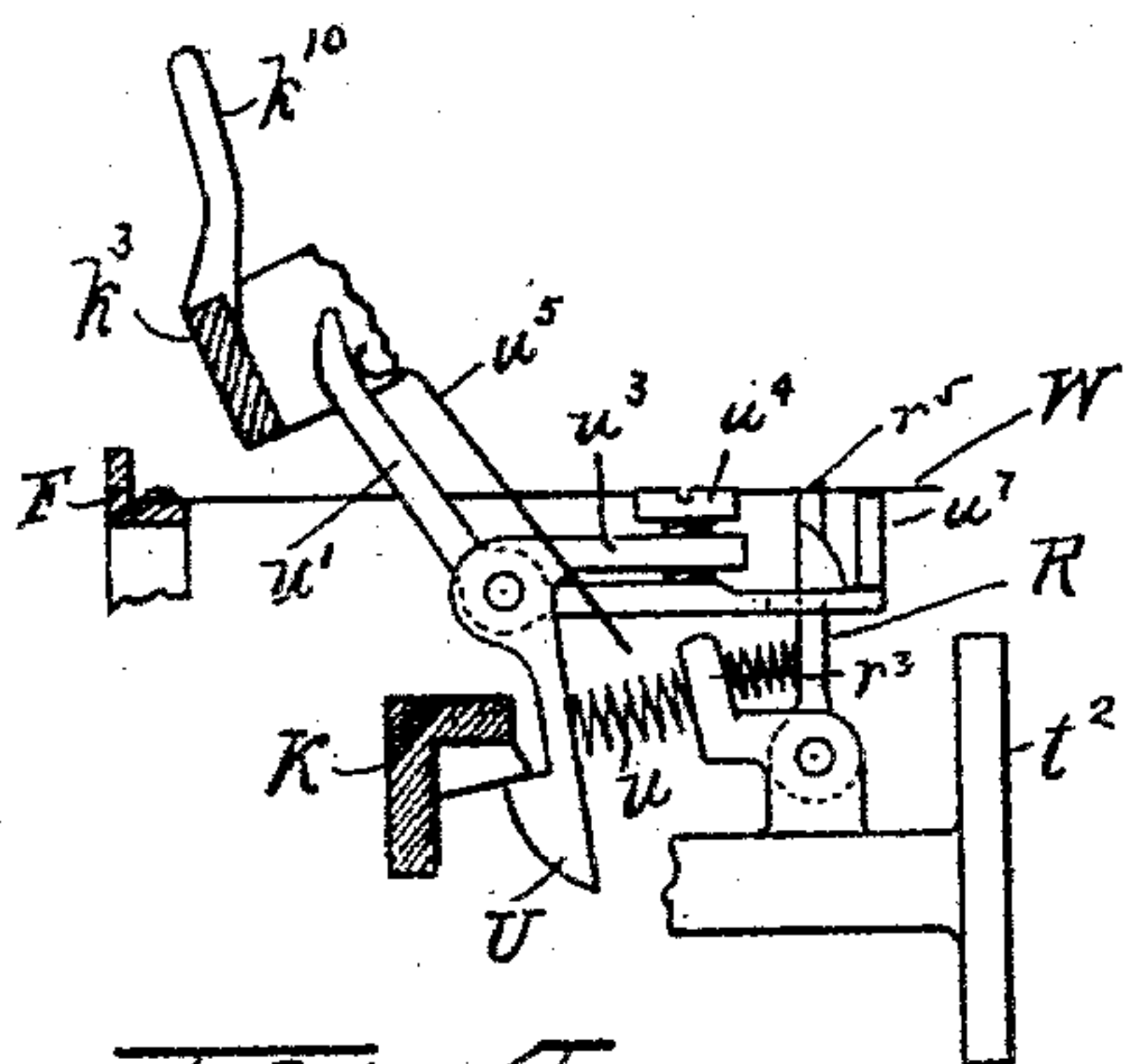
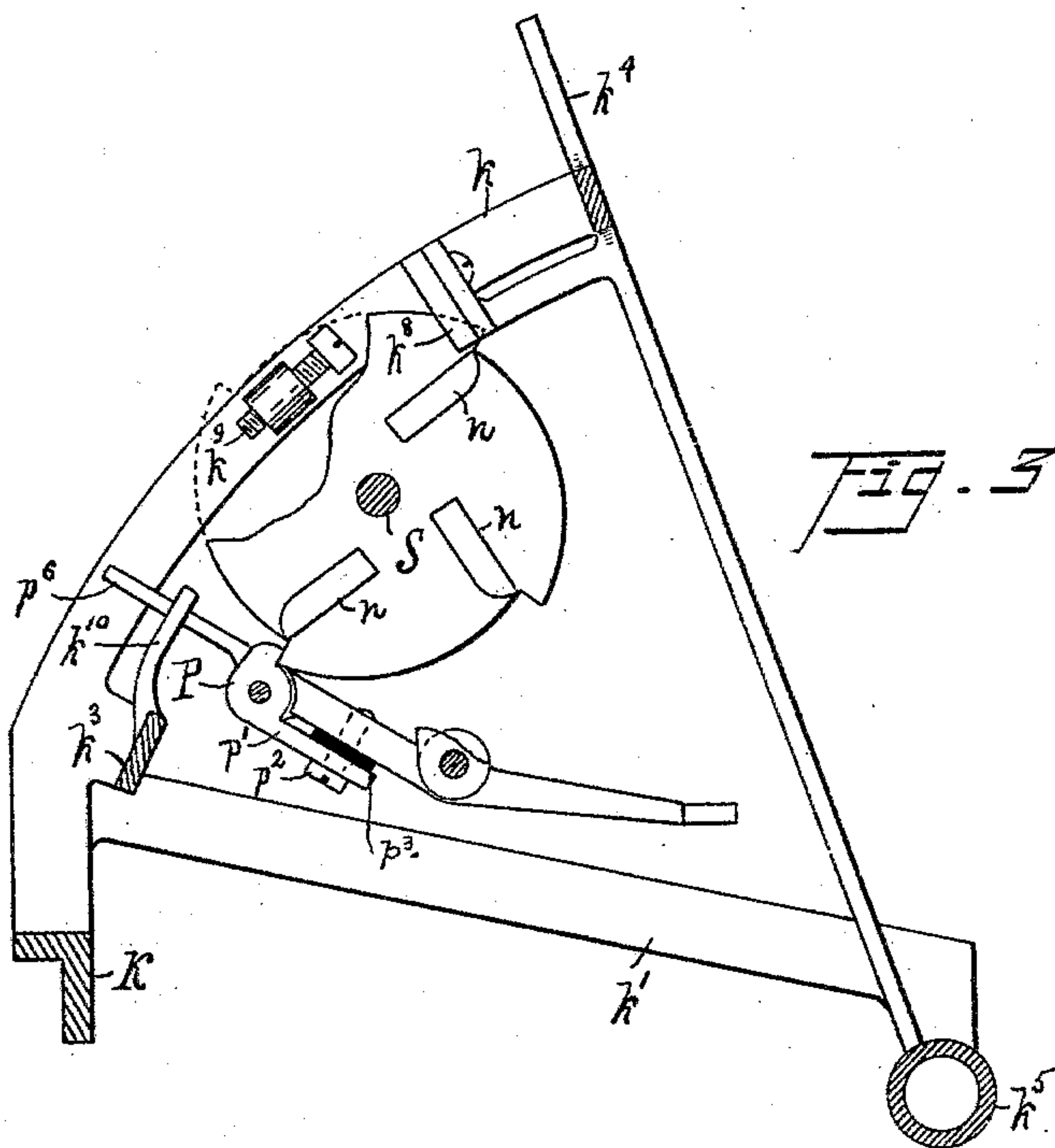
By O. L. Thurston

his attorney

3 Sheets—Sheet 3.

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Patented Jan. 25, 1898.



Witnesses.

H. Grievold
Helen M. Litchison.

Inventor.

Edmund B. Kirby

By E. L. Thurston
his attorney

UNITED STATES PATENT OFFICE.

EDMUND B. KIRBY, OF DENVER, COLORADO.

KEYBOARD FOR TYPE-WRITING MACHINES.

SPECIFICATION forming part of Letters Patent No. 597,776, dated January 25, 1898.

Application filed June 20, 1896. Renewed June 18, 1897. Serial No. 641,385. (No model.)

To all whom it may concern:

Be it known that I, EDMUND B. KIRBY, a citizen of the United States, residing at Denver, in the county of Arapahoe and State of Colorado, have invented certain new and useful Improvements in Keyboard Mechanism for Type-Writers and Analogous Machines; and I do hereby declare the following to be a full, clear, and exact description of the invention, such as will enable others skilled in the art to which it appertains to make and use the same.

My present invention relates to certain improvements in the keyboard mechanism for type-writers and analogous machines which is described in my application, Serial No. 567,989, filed November 5, 1895.

The objects of the present invention are to simplify the mechanism and to increase its efficiency and durability.

The invention consists in the construction and combination of parts which are hereinafter described in detail, and definitely set forth in the claims.

In the drawings, Figure 1 is a plan view of the mechanism embodying my invention. Fig. 2 is a sectional side elevation of said mechanism on line 2 2 of Fig. 1 viewed from the right. Fig. 3 is a sectional side view on line 3 3 of Fig. 1 of certain parts of the mechanism viewed from the left. Fig. 4 is an enlarged view of the mechanism for holding and releasing the striking-bar. Fig. 5 is a similar view of the same parts when in position to release said striking-bar, and Fig. 6 is a front view of some of said mechanisms.

Referring to the parts by letters and numerals, *a* 1 2 3 4 5 *c* *L* represent the several longitudinal movable notched combination-bars and lock-bar.

1^a 2^a 3^a 4^a 5^a represent one bank of keys, 1^b 2^b 3^b 4^b 5^b represent a second bank of keys, and 1^c 2^c 3^c 4^c 5^c a third bank of keys.

D *D* represent the rock-shafts, having arms *d*, with which the stems of the keys engage. *d*⁴ represents arms attached to said rock-shafts, whereby the motion of the rock-shafts causes the longitudinal movement of the notched bars.

O *O* represent the key-levers of any type-

writer with which my mechanism is to be used, and *M* represents push-rods, which are pivoted to said levers *O* for transmitting motion from a striking-bar to said levers. Each of the push-rods *M* has on its front side a cam *m*².

The mechanism above described is substantially like the corresponding mechanism which is shown and described in detail in the prior application referred to, and it has the same mode of operation, wherefore it is believed that it is unnecessary to give a more extended description of said parts in this application.

A series of letter-bars *G*, which are pivoted on a transverse rod *g*³, extend over the combination-bars and normally rest upon one or more of the stubs between the notches in said combination-bars, being severally under the influence of the springs *g*¹. To this extent these letter-bars are substantially like the letter-bars described in said prior application; but the letter-bars, instead of acting directly upon the push-rods *M* to move them beneath the striking-bar, as they do in the machine described in said former application, merely act as triggers which normally hold and prevent the action of independent mechanism for moving said push-rods. This independent mechanism consists of a triple lever *E* for each push-rod and letter-bar. All of these triple levers are pivoted upon a transverse rod *e* and are provided with arms *e*¹ *e*² *e*³, extending, respectively, downward, upward, and forward, and each triple lever is under the influence of a spring *e*⁶, acting upon the top of the arm *e*³, and tending to rock said lever so that its arm *e*¹ is moved rearward. The downwardly-extended arm *e*¹ of each triple lever is provided with a toe *e*⁴, which is adapted to engage with the push-rod *M* when the lever *E* is released, with the result of moving said push-rod beneath the striking-bar. On the rear end of the letter-bars is a tooth *g*, which engages with the lower end of the arm *e*³ and prevents its rearward motion. The forwardly-extended arm *e*¹ is bent downward and has at its lower end a beveled finger *e*⁵, which engages with the beveled upper end of an arm *g*⁴, projecting up-

wardly from the letter-bar. The third arm e^2 extends upwardly and lies just behind but in contact with the trigger-bar F. This trigger-bar is secured to the tops of two arms f , which are pivoted at their lower ends to the framework of the machine.

The striking-bar K, which extends transversely of the machine, so that it may act upon any push-rod, is secured at its ends to side bars k' , which are pivoted, preferably on a transverse rod k^5 , to the sides of the machine. At the middle of the machine two curved arms k k are secured to the striking-bar and extend therefrom upward and forward, and they are united at their upper ends and near the striking-bar by two cross-bars k^2 k^3 . An arm k^4 , which is connected with the cross-bar, is pivoted at its lower end in line with the pivots of the side bars, preferably on the transverse rod k^5 . These two side bars k' , striking-bar K, curved arms k k , cross-bars k^2 k^3 , and arm k^4 are all rigidly connected and constitute a striking-bar frame which swings upon the axis of the rod k^5 . The upper end of the arm k^4 lies between the two adjustably-fixed rubber buffers k^6 k^7 , which it strikes as the said frame is moved forward and backward, these buffers acting as stops and taking up the jar at both ends of the movements of said frame. The said frame is moved backward and downward to cause the actuation of a key-lever O of the type-writer by a spring T, which is held between a fixed cross-bar t , forming a part of the framework of the machine, and the arm k^4 of said striking-bar frame. The frame is returned to its normal position by a power device which is released for this purpose when the striking-bar has completed its downward stroke. In the construction shown this power device consists of four wiper-arms n , which successively engage with a step k^8 , which is secured to the striking-bar frame. These wiper-arms are set into the face of the escapement-wheel n , which is fast on a shaft S, which is subject to a constant force, as a spring, tending to revolve it. I have not shown the source of this force in the drawings, because any suitable mechanism for the purpose may be employed. The power is liberated to operate the said shaft by an escapement which is actuated by the striking-bar frame. The escapement, as shown, consists of the four-tooth escapement-wheel n' , fast upon the shaft S, which is held at rest by a pallet P, having a tooth p , which engages with the teeth of said escapement-wheel. The tooth p is preferably pivoted to the pallet and has an arm p' , whose movement is limited by the screw-head p^2 and by a rubber buffer p^3 , interposed between said arm and the pallet. An adjustable spring p^4 , interposed between the front arm p^5 of the pallet and the fixed bracket f' , holds the tooth against the escapement-wheel. A rearward prolongation p^6 of said pallet lies in the path of an adjustable screw-point k^9 , carried by one

of the curved arms k of the striking-bar frame, and when the striking-bar has completed its operative movement this screw-point strikes the pallet-arm p^6 and by moving it with- draws the tooth p from the escapement-wheel. The shaft S thereupon revolves, one of the wiper-arms n engages with the step k^8 , and the striking-bar frame is lifted. When it reaches its highest point, the pallet-tooth engages with the ratchet and prevents further movement of the shaft. At the same time a spring-pawl U engages beneath the striking-bar K and prevents its movement downward. This pawl U is pivoted to a fixed bracket t^2 and is pressed toward the striking-bar by a spring u . A bent lever is pivoted upon the same pivot to the same bracket. This lever has two arms u' u^2 , of which the former extends forward to a point where it may come in contact with the cross-bar k^3 on the striking-bar frame. The other arm u^2 extends rearward, passing beneath an angle-arm u^3 , secured to the spring-pawl U. An adjustable screw u^4 , passing through the said arm, bears upon the said lever-arm u^2 . A spring u^5 , acting upon the arm u' , exerts a force tending to move said arm forward, and consequently lift the arm u^2 , and this lifting of the arm u^2 withdraws the pawl U from its engagement with the striking-bar K.

The lever-arm u^2 is prevented from being lifted under ordinary conditions by a pawl R, which passes through a slot in said lever-arm u^2 , and its tooth r engages with said lever-arm. This pawl is pivoted to the bracket t^2 , and an arm r' is rigidly secured to this pawl. The upper end of this arm enters a slot in a flat spring W, which is attached to the trigger-bar F. On the striking-bar frame is a cam-plate k^{10} , which is adapted to engage with the lever-arm u' and to move it in opposition to its spring u^5 .

The operation of the described mechanism is as follows: One or more of the combination-bars is moved and the notches are alined beneath a letter-bar G, which is moved into the slot thus formed by its spring g' . This movement releases the corresponding triple lever E, which is moved by its spring e^6 . The toe e^4 thereupon moves the corresponding push-rod M beneath the striking-bar K. The upper arm e^2 moves the trigger-bar F forward. The spring W thereupon draws upon the arm r' , thereby moving the pawl R forward. This releases the arm u^2 of lever, and thereupon the spring u^5 rocks the lever-arm u' against the cross-bar k^3 . The said movement of said lever moves the pawl U and releases the striking-bar. It descends under the influence of the spring and forces down the push-rod. The cam on the push-rod moves the triple lever E in the reverse direction, and the beveled finger e^5 engages with the beveled surface on the arm g^4 on the letter-bar, thereby lifting the letter-bar and permitting the lock-bar L to move beneath it, whereby the combination-

bars resume their normal position. The cam-plate k^{10} engages with the lever-arm u' and moves it in opposition to its spring u^5 . The other arm u^2 is engaged automatically by the pawl r , which has been permitted to resume its normal position because the trigger-bar was returned to its normal position by its spring when the triple lever was moved by the cam on the push-rod. This leaves the pawl U free to engage with the striking-bar when the latter has been raised. The spring W was lifted and upheld out of contact with the pawl r by a finger u^7 on the end of the lever-arm u^2 when the spring u^5 lifted it, wherefore the pawl R was relieved of all pressure which would interfere with its movement by its spring r^3 . Just as the striking-bar reaches its lowest position the screw k^9 , carried by the striking-bar frame, engages with the pallet-arm p^6 , thereby releasing the escapement-wheel, whereupon the shaft S immediately revolves and one of the wiper-arms n engages with the step k^8 and lifts the striking-bar frame. When it has reached its highest point, the pawl U automatically engages with the striking-bar and holds it up, as before explained. The pallet-tooth is moved by spring p^4 and engages with the escapement-wheel N . All of the parts have now been returned to their normal position ready for a repetition of the described action.

Having described my invention, I claim—

1. The combination of the notched combination-bars, a plurality of independently-movable spring-pressed letter-bars, each having a retaining-jaw, push-rods for operating the type-writer levers and a striking-bar, with the corresponding spring-pressed levers E which are severally adapted to engage with and move the corresponding push-rods in range of the striking-bar, and are themselves engaged and held in opposition to their springs by the jaws on the corresponding letter-bars, substantially as and for the purpose specified.

2. The combination of the notched combination-bars, a plurality of independently-movable letter-bars each having a retaining-jaw, a beveled arm, and push-rods having cams and a striking-bar, with the independent spring-pressed levers E which are engaged by the jaws on the corresponding letter-bars and held in opposition to their springs, each of said levers having a toe for engagement with the corresponding push-rod and its cam, and a beveled arm for engagement with the beveled arm on the corresponding letter-bar, substantially as and for the purpose specified.

3. The combination of the notched combination-bars, a plurality of independently-movable spring-actuated letter-bars each having a retaining-jaw and a beveled arm, the push-rods having cams, the striking-bar, retaining mechanism preventing the movement of the latter, and a trigger-bar for operating said retaining mechanism, with the spring-pressed three-arm levers E , of which one arm

of each lever is engaged by the jaw on the corresponding letter-bar and provided with a toe for engagement with the corresponding push-rod and its cam, another arm has a beveled surface which is for engagement with the beveled arm on the letter-bar, and that arm is adapted to operate the trigger-bar, substantially as and for the purpose specified.

4. The combination of the striking-bar and its frame, a spring for moving it down in the operative direction, a retaining-pawl for preventing such movement, a driven operating-shaft, wiper-arms secured thereto and adapted to engage with and lift the striking-bar, an escapement-wheel on said shaft, a pallet having an arm which extends into the path of some part of the striking-bar frame, whereby said pallet is withdrawn from the escapement-wheel, and means for withdrawing the retaining-pawl, substantially as and for the purpose specified.

5. The combination of the push-rods and mechanism for moving them into the path of the striking-bar, with a pivoted striking-bar frame, the striking-bar, a spring for moving said striking-bar in the operative direction, a spring-pawl for preventing such movement, mechanism for withdrawing said pawl, and mechanism for returning said striking-bar frame to its normal position, substantially as and for the purpose specified.

6. The combination of the pivoted striking-bar frame, a spring for moving it in the operative direction, a spring-pawl for preventing such movement, the trigger-bar, mechanism for moving it, mechanism intermediate of said trigger-bar and pawl for withdrawing the latter, a driven operating-shaft, wiper-arms carried thereby for lifting the said frame in opposition to its spring, an escapement-wheel, a spring-actuated pallet which extends into the path of some part of said frame whereby the pallet is withdrawn, substantially as and for the purpose specified.

7. The combination of the striking-bar frame, and mechanism for moving it in the operative direction, with a spring-pawl U having an angle-arm u^8 , the lever having an arm u^2 which passes beneath the angle-arm u^8 , a spring for actuating said lever, a retaining-pawl R for engagement with said lever to hold it in opposition to its spring, the trigger-bar, and mechanism intermediate of said trigger-bar and pawl R whereby the latter is withdrawn, substantially as and for the purpose specified.

8. The combination of the striking-bar frame, mechanism for operating it, and a cam-plate k^{10} carried by said striking-bar frame, with the spring-pawl U which engages with and prevents the downward movement of said frame, said pawl having an angle-arm u^8 , a lever having one arm u^2 which is in position to engage with said arm u^8 and withdraw the pawl, and another arm u' which is adapted to be engaged by said cam-plate, a spring press-

ing said arm toward said cam-plate, a spring-
retaining pawl R adapted to engage with the
arm *u'* to prevent the movement of the lever
by its spring, the trigger-bar, and interme-
5 diate mechanism whereby the movement of
the trigger-bar withdraws said retaining-pawl,
substantially as and for the purpose specified.

In testimony whereof I affix my signature
in presence of two witnesses.

EDMUND B. KIRBY.

Witnesses:

C. D. GREENALL,
FRANK H. LIPPITT.