March 30, 1926. 1,579,151

C. SCHLÜNS

TYPEWRITING MACHINE WITH POWER DRIVE

Filed July 28, 1923 4 Sheets-Sheet 1

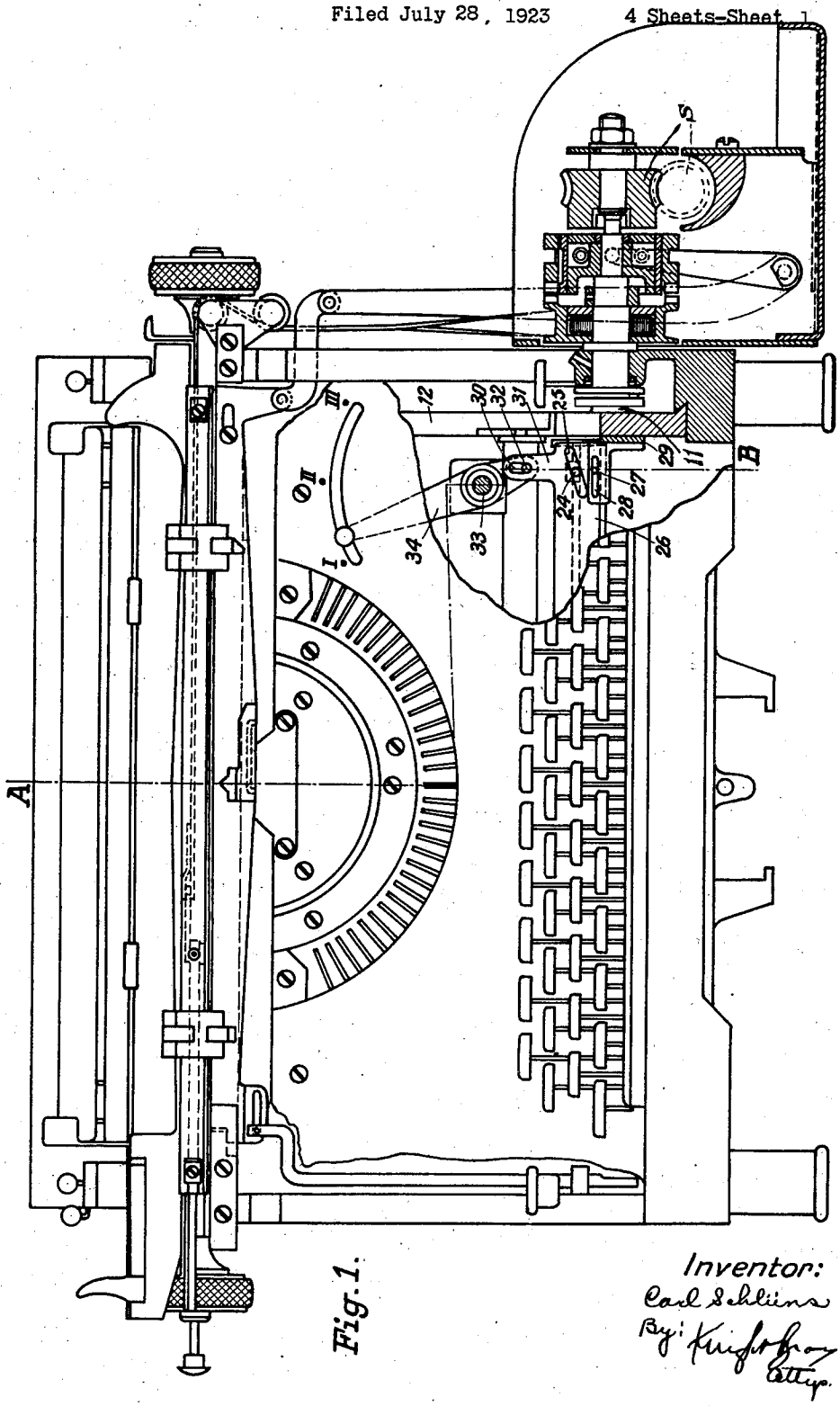


Fig. 1.

Inventor:
Carl Schlüns
By: Kuhnhenn & Kuhnhenn
Attys.

March 30, 1926. 1,579,151

C. SCHLÜNS

TYPEWRITING MACHINE WITH POWER DRIVE

Filed July 28, 1923 4 Sheets-Sheet 2

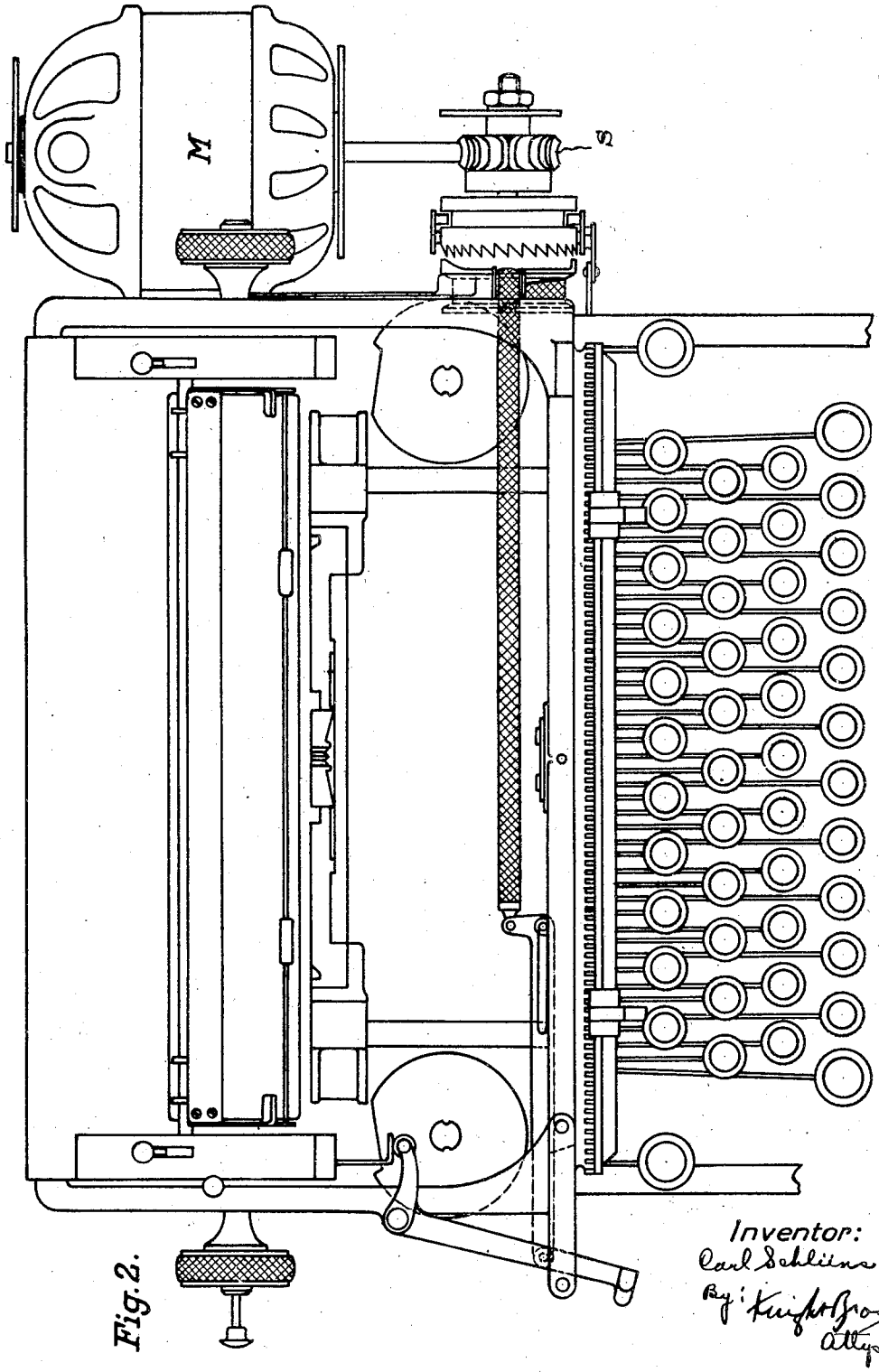


Fig. 2.

Inventor:
Carl Schlüns
By: Knight Bros
Attys

March 30, 1926. 1,579,151

C. SCHLÜNS

TYPEWRITING MACHINE WITH POWER DRIVE

Filed July 28, 1923 4 Sheets-Sheet 3

Fig. 4.

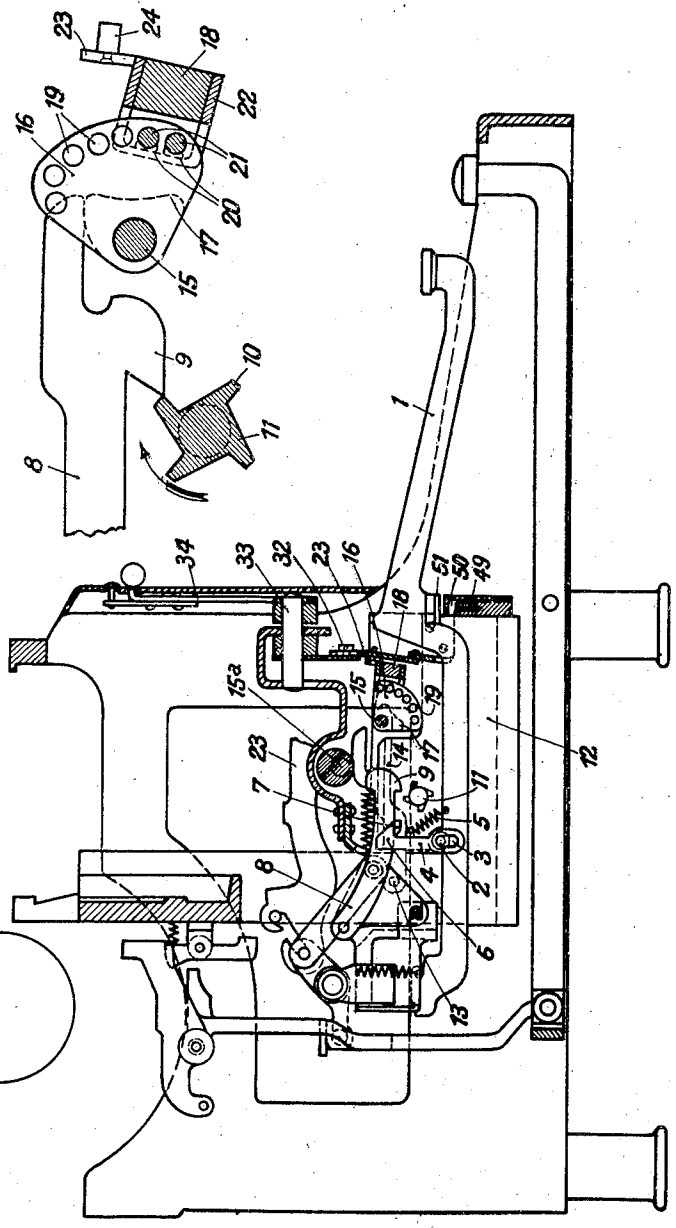


Fig. 3. (A—B)

Inventor:
Carl Schlüns
By: Knight Bros
Attys.

March 30, 1926. 1,579,151

C. SCHLÜNS

TYPEWRITING MACHINE WITH POWER DRIVE

Filed July 28, 1923 4 Sheets-Sheet 4

Fig. 7.

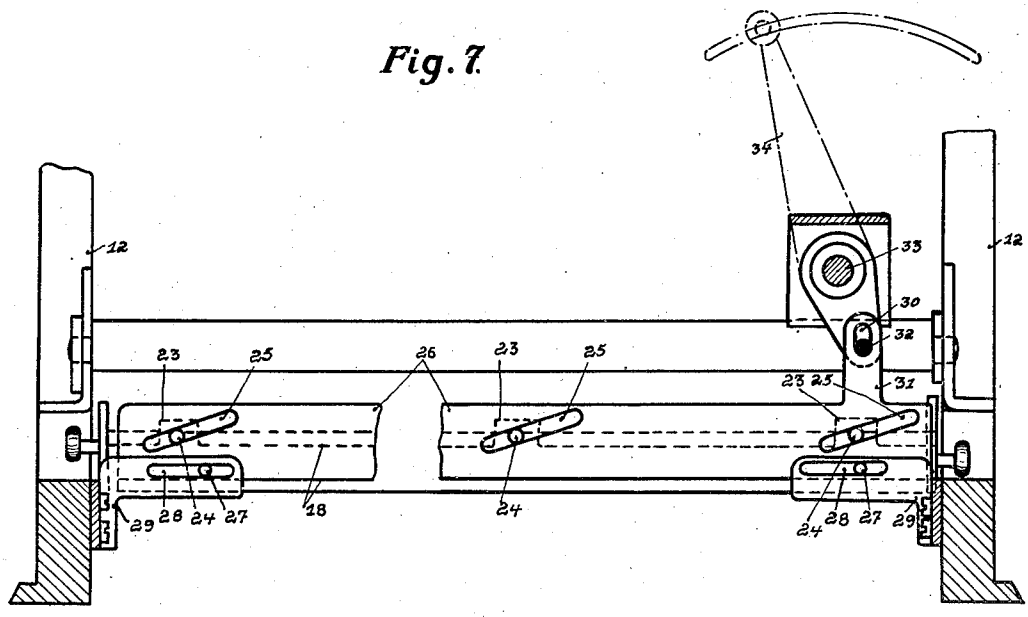


Fig. 8.

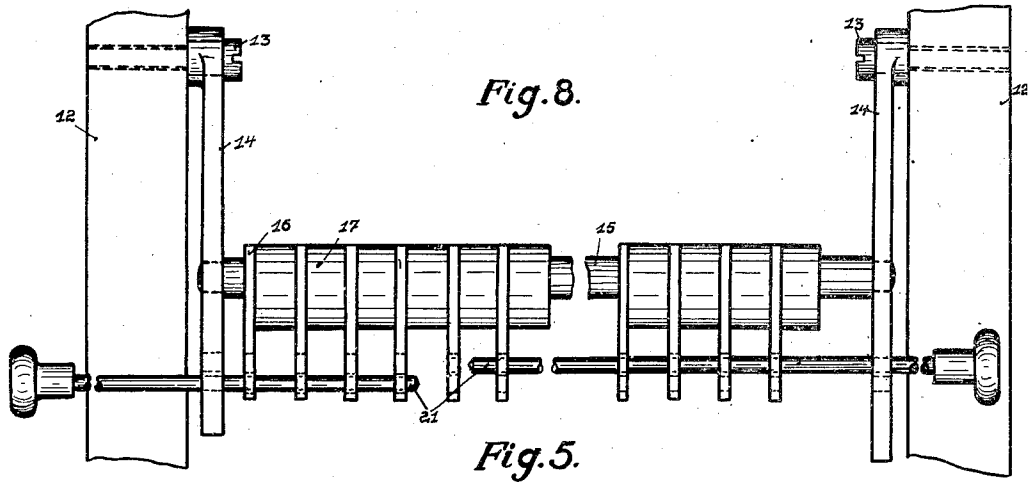
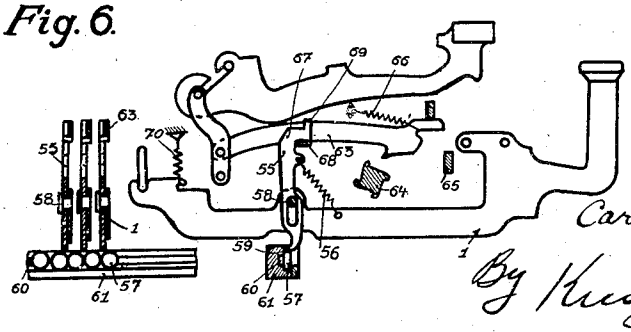


Fig. 5.

Fig. 6.



Inventor
Carl Schlüns
By Knight Bros
attys

Patented Mar. 30, 1926. 1,579,151

UNITED STATES PATENT OFFICE.

CARL SCHLÜNS, OF BERLIN-STEGLITZ, GERMANY, ASSIGNOR TO MERCEDES BÜRO-MASCHINEN- UND WAFFEN-WERKE, OF BENSHAUSEN, THURINGIA, POST MEHLIS, GERMANY.

TYPEWRITING MACHINE WITH POWER DRIVE.

Application filed July 28, 1923. Serial No. 654,446.

To all whom it may concern:

Be it known that I, CARL SCHLÜNS, a citizen of Germany, residing at Berlin-Steglitz, Germany, have invented certain new and useful Improvements in Type-writing Machines with Power Drive (for which I have filed applications in Germany Aug. 31, 1920; Nov. 26, 1921; Feb. 20, 1922; Apr. 25, 1922; May 11, 1922; June 20, 1922; July 19, 1922), of which the following is a specification.

This invention relates to a type-writing machine with power drive.

According to this invention the element which, at the depression of a key lever, produces the coupling between the mechanically driven cam shaft and the type lever is elastically constructed in such a manner that, even if the coupling member strikes against a cam or against any other obstacle, the keys may be moved without impediment into the end-position. The key levers may further have elastic locking levers adjustable in longitudinal direction and designed to engage between the locking elements at the depressing of the key level. These locking levers may elastically engage during the locking process with a stop preventing the longitudinal displacement of the locking levers. A pulling or pressing element serves preferably for releasing said locking levers, the element being operated by the type-lever which drops back, said locking lever being thus oscillated perpendicularly to its longitudinal direction, so that it is brought, owing to its elasticity, automatically and independently of the key lever into the position of rest.

A further feature of the invention is an improved device for adjusting either singly or in common the type levers, as regards their striking force, in a machine equipped with the above described type lever actuation. In order to regulate the striking force of each type lever adjusting members are coupled by a common adjusting element in such a manner that they are adjusted all at the same time whereby it is possible to adapt the machine to the prevailing conditions of service. In this manner it is possible to increase the striking force of all the type levers if for instance a greater number of copies have to be typed. It is further possible to regulate the position of the striking force of each single type lever in case of a type being prematurely worn. A transverse beam arranged under the coupling elements may for instance carry adjusting elements which permit the adjusting of the several types, or the adjusting elements which are independent per se may be releasably mounted by locking members. These locking members are preferably arranged in such a manner that each individual adjusting element may be released individually, the locking of all the other elements being preserved. Two rods inserted from opposite sides into rows of holes arranged on an arc concentric to the pivot axle of the adjusting elements may serve as locking elements. The centering is preferably regulated by a transmission member, controlled by a lever, so that a very accurate adjusting is possible.

The invention will be best understood from a consideration of the following detailed description taken in connection with the accompanying drawings forming a part of this specification, with the understanding that while on the drawings one embodiment of the invention is disclosed, the invention is not confined to any strict conformity with the showing of the drawings, but may be embodied in any manner which does not make a material departure from the salient features of the invention.

In the drawings:—

Fig. 1 shows in perspective front elevation a type-writing machine in which the machine proper is shown in elevation and the power coupling in section.

Fig. 2 is a plan view of Fig. 1.

Fig. 3 is a cross section on line A—B of Fig. 1.

Fig. 4 shows on enlarged scale constructional details of the part shown in Fig. 3.

Fig. 5 shows the key-locking mechanism in elevation.

Fig. 6 is a section through the locking-lever, locking-element and the locking bar as shown in Fig. 5.

Fig. 7 is a face view, in an enlarged scale, of the mechanism serving for the common adjustment of the type levers, and Fig. 8 shows in enlarged scale, a top plan view of the individual adjusting members in the position in which one of the members for the purpose of adjustment is released from the others. For the sake of clearness the

bar serving for the common adjustment has been omitted.

With the key lever 1 (Fig. 3) the latch 4 is movably connected as its vertical slot 3 engages over the stud 2 laterally projecting from the key lever. The latch 4 is maintained in its position by the springs 5, a stud being provided for determining the position of rest of said latch. The nose 6 of latch 4 grips over the projection 7 of the pull hook 8. If the key lever 1 is being depressed it pulls through the intermediary of the latch 4 the pull hook 8 down so that the nose 9 at the end of this pull hook comes into the range of the cams 10 (Fig 4.) of the driving shaft 11 which is journalled in the walls 12 of the type cage and driven by a motor M whose rotation is transmitted thereto by a worm drive S permanently rotated in the direction of the arrow (Figs. 3 and 4), whereby the striking of the type lever 23 is produced in the well known manner. If at the depression of the key lever 1 a cam 10 should stand just under the nose 9 the descending of the key may nevertheless continue owing to the fact that the latch 4 is spring controlled and adapted to move in vertical direction, so that shocks at the depression of the key levers 1 are avoided.

On the inner surface of the side walls 12 of the cage (Figs. 1, 3, 7 and 8) levers 14 are pivotally arranged each on a screw bolt 13. These levers are rigidly connected with one another by means of an axle 15 situated under the pull levers, so that the levers and the axle form a bridge. Around the axle 15 adjusting elements are pivotally arranged which are preferably each composed of two separate parts 16, 17 secured in determined position with regard to one another. In accordance with the intervals, the strength, and the number of the adjusting elements a bar 18 parallel to the axle 15 and fixed between the ends of the lever 14 is arranged which has cross slits. The adjusting disks 16 of the adjusting elements have holes 19 arranged on an arc concentric to the axle 15. Two adjusting pins 21 are inserted through longitudinal slits 20 of the bar and through holes 19 of all adjusting disks 16. The longitudinal slits 20 are preferably covered by a sheet metal hood 22 in order to ensure a better guiding of the adjusting pins, the bent flaps 23 serving for the centering of said hood. The flaps 23 have guide pins 24 engaging with oblique guide slots 25 of the bar 26 for the centering (Figs 1 and 7). The guide pins 27 riveted on this bar move in the slots 28 of the angle irons 29 fixed on the side walls 12 of the cage and serve for preventing the displacement of the centering bar in vertical direction. On the centering bar 26 a flap 31 having a longitudinal slot 30 is arranged. With this longitudinal slot 30 engages the screw 32 of the two-armed adjusting lever 34 pivotally mounted on the axle 33 (Figs. 1, 3, and 7).

The operation of this device is as follows:—

By depression of the key lever 1 the pull hook 8 is brought into the range of the driving shaft 11 which rotates in the direction of the arrow, and it comes in engagement with said shaft whereby the type lever is operated. The striking force corresponds with the depth for which the pull hook engages with the cam shaft and with the consequent duration of this engagement. The depth of the engagement and the duration of the same are regulated by the adjusting mechanism in the following manner:—

At the first adjusting one of the adjusting pins is inserted after the adjusting disks 16 have been brought to the corresponding position with the aid of a small adjusting hook. The duration of the engagement of the pull hook 8 is shortened or lengthened by oscillating the adjusting disks upwardly or downwardly and by securing the same in position by inserting the adjusting needle, the striking force being thus weakened or strengthened as the eccentric 17 is fixed on the adjusting disk 16. All the types successively from right to left or from left to right may be thus uniformly adjusted as regards their printing force. When the adjusting is finished the second adjusting needle is inserted from the opposite direction to the first one, this second adjusting pin being unnecessary for the successive adjusting of the pull hooks but necessary if an individual pull hook has to be adjusted owing to being prematurely worn. By partly pulling out the two adjusting pins the adjusting element to be adjusted is released, but all the other adjusting elements remain secured in their positions. After the adjusting of the individual pull hook the adjusting needles are completely reinserted so that this adjusting element is also secured in its position.

The typist has with this arrangement the ability to raise or to lower the entire adjusting mechanism through the intermediary of the bar 26 in oscillating the same around the pivot 13, the lever 34 having to be turned for this purpose to the left or to the right whereby the striking force of all the types is uniformly increased or weakened. If therefore the lever 34 is brought into the position designated as 1 it is evident that bar 26 will be moved to the right so that the oblique slots 25 will press the pins 24 and therewith the bar 18 downwardly so that the lever 8 will remain longer in engagement with the teeth 10 of the shaft 11 thereby giving a stronger stroke to all the type levers. Consequently the lever 34 will be in this position when it is necessary to make several copies. If the lever 34 is brought into the position designated as 11

a medium stroke of the type levers is secured, while by placing the lever 34 in the position 111 a weaker stroke of the type levers results.

For limiting the movement of the pull hooks 8 in upward direction and for securing the correct engaging of the noses 6 of the levers 4 with the noses 7 of the pull hooks 8 an eccentrically adjustable axle 15a (Fig. 3) is arranged between the side walls of the cage.

In order to prevent the simultaneous depression of two key levers a key locking mechanism is arranged which consists essentially or rollers 49 (Fig. 3) loosely located in a guide groove 50. Wedges 51 are arranged on the key levers 1. The total interval between the rollers 49 is calculated so that it is less than the cross section of a wedge 51. The wedge 51 can therefore be inserted between the rollers 49 only so far that the wedge-faces are still tangent to the rollers.

The wedge 51 engaging between the rollers displaces all the rollers to the right and to the left respectively so that all the rollers are incontact without any interval, the engaging of the pull hook 8 with the cam shaft 11 being thus made possible. If after the depression of a key lever a second key lever is depressed this second key lever can not reach the working position.

The secure locking of the key levers in avoiding any clamping action, which is otherwise caused by the wedges 51, is especially important for mechanically driven type writing machines.

Figs. 5 and 6 show a form of construction of a key locking mechanism in which at the depression of one key lever 1 the locking lever 55 corresponding to latch 4 in Fig. 3 is brought, through the action of a spring 56, between two adjacent rollers 57, said rollers moving away from one another for a distance which is equal to the thickness of the lever, all other rollers being pressed together without interval so that no other locking lever 55 can penetrate between the same until the first locking lever has been withdrawn.

As the spring 56 tends to oscillate the locking lever 55 around the bolt 58 in clockwise direction the nose 59 engages in this position with the groove 60 of the locking rail or keeper 61 and prevents a collision between two type levers at a premature releasing of the depressed key lever with regard to the lever to be depressed anew. If a depressed key lever is prematurely released, the nose 59 of the locking lever 55 will retain this locking lever and the key lever 1 in the lower position. A second key lever may however be depressed already, but the type lever of this key could execute its movement only after the first type lever returning to its position of rest has made its locking lever oscillate for instance by means of the pull hook 63, so that it gets out from between the locking rollers. The locking lever 55 brings, at its descending movement, the corresponding pull hook 63 into the range of the cam shaft 64.

The rotating shaft 64 draws the pull hook 63 along until the stripping rail 65 disengages the same from the shaft 64 whereupon said hook is brought into the position of rest by the action of a spring 66. Before the pull hook 63 comes in contact with the rail 65, the hook 67 of the locking lever 55 has been released owing to the movement in longitudinal direction of the pull lever 63.

When the pull lever 63 is returned to the position of rest the small hook 68 of the pull hook 63 presses back the nose 69 of the locking lever 55 whereby the nose 59 of this locking lever is made to disengage from groove 60. This disengaging takes therefore place as soon as the type lever has reached again its position of rest.

The key lever 1 is brought to its position of rest by the action of spring 70. The locking lever 55 jumps back under the hook 68 of the pull hook 63 under the action of the spring 56.

I claim:—

1. In a typewriter, type levers, a rotating drive shaft, means connected with said type levers for operating the latter, means for bringing said operating means into engagement with said drive shaft for actuating said type levers, independently rotatable abutment cams for limiting the engagement of said operating means with said drive shaft, and means for locking said cams in selective positions.

2. In a typewriter, type levers, a rotating drive shaft, operating means connected to said type levers, means for engaging said operating means with said drive shaft, a transverse member beneath aid operating means, means for raising and lowering said member for limiting the engagement of said operating means with said drive shaft, and independent means mounted on said member for selectively regulating the engagement of said operating means with said drive shaft.

3. In a typewriter, type levers, a rotating drive shaft, means connected with said type levers for operating the latter, means for bringing said operating means into engagement with said drive shaft for actuating said type levers, independently adjustable abutment members for said operating means for limiting the engagement of the latter with said drive shaft, and means for adjusting said abutment members in common.

4. In a typewriter, type levers, a rotating drive shaft, means connected with said type levers for operating the latter, means for

bringing said operating means into engagement with said drive shaft for actuating said type levers, independently rotatable abutment cams for limiting the engagement of said operating means with said drive shaft, means for locking said cams in selective positions, a common mounting shaft for said cams, and means for moving said mounting shaft for adjusting said cams in common.

5. In a typewriter, a key lever, a type lever, a rotating drive shaft, an operating member linked to said type lever, means on said operating member for engaging said shaft on the actuation of said key lever, an abutment for limiting the engagement of said operating member with said shaft, a lever, and means whereby on the actuation of said lever said abutment is displaced, for the purpose described.

6. In a typewriter, a key lever, a type lever, a rotating drive shaft, an operating member connected to said type lever, means on said operating member for engaging said shaft upon the actuation of said key lever, an abutment for limiting the engagement of said operating member with said shaft, a pivotal support for said abutment, a cam surface, means in connection with said abutment engaging said cam surface, and means for displacing said cam surface for adjusting the position of said abutment.

7. In a typewriter, key levers, type levers, a rotating drive shaft, operating members connected to said type levers, said operating members being adapted to engage said shaft upon the actuation of said key levers, an abutment member common to all of said operating members for limiting their engagement with said shaft, a lever, and means interposed between one end of said lever and said abutment member whereby on a movement of said lever said abutment member is displaced relative to all of said operating members for adjusting the striking force of all the latter equally and in common.

8. In a typewriter, a rotating cam element, key levers, type levers, pull hooks in connection with said type levers, whereby on the depression of a key lever an associated pull hook is brought within the influence of said cam element for actuating a respective type lever, means for determining the movement of single pull hooks, and means for determining the movement of said pull hooks in common.

9. In a typewriter, a rotating cam element, key levers, type levers, pull hooks in connection with said type levers, means whereby on the depression of a key lever a pull hook is brought within the influence of said cam element for actuating said type lever, and independently adjustable abutment elements for determining the movement of said pull hook, said abutment elements consisting of pivoted cams, and means for locking said cams in desired position.

10. In a typewriter, a rotating cam element, a key lever, a type lever, a pull hook in connection with said type lever, means whereby on the depression of said key lever said pull hook is brought within the influence of said cam element for actuating said type lever, an adjustable abutment means for determining the movement of said pull hook, said abutment means comprising a pivoted cam, a disk in rigid connection with said cam, said disk being provided with apertures arranged on an arc concentric with the pivotal point of said cam, and a pin selectively insertable in said apertures for locking said cam.

11. In a typewriter, a rotating cam element, key levers, type levers, pull hooks in connection with said type levers, means whereby on the depression of a key lever an associated pull hook is brought within the influence of said cam element for actuating a respective type lever, and independent abutment means for determining the movement of said pull hooks, comprising pivoted cams coaxially arranged, disks in rigid connection with said cams, said disks being provided with apertures arranged on an arc concentric with the axis of said cams, and pins insertable in said apertures from opposite directions for locking said cams.

12. Structure according to claim 11 wherein the pins are inserted substantially parallelly in different sets of aligned apertures.

13. In a typewriter, a rotating cam element, key levers, type levers, operating members, means whereby on the depression of a key lever an associated operating member is brought within the influence of said cam element for actuating a respective type lever, independently adjustable abutment means for determining the movement of said operating members, a pivoted frame for supporting said abutment means, and means for moving said frame about its pivot points whereby said abutment means are adapted to be adjusted in common.

14. In a typewriter, a type lever, a key lever, a rotating drive shaft, an operating member in connection with said type lever, a latch member engaging said operating member, a pin and slot connection between said latch member and said key lever, and spring means interposed between said key lever and said latch member, whereby upon the actuation of said key lever said latch member is impositively influenced for bringing said operating member into engagement with said shaft.

15. In a typewriter, a key lever, a type

lever, a pull hook in connection with said type lever, a latch member forming a coupling element between said key lever and said pull hook, said latch member having a slot therein, said key lever having a pin projecting in said slot, and a spring interposed between said latch member and said key lever, whereby said latch member is adapted to be impositively influenced upon the depression of said key lever.

16. In a typewriter, a type lever, a rotating drive shaft, an operating member in connection with said type lever, a latch member engaging said operating member, means for displacing said latch member whereby said operating member is brought into engagement with said drive shaft, and means for locking said latch member in displaced position.

17. In a typewriter, type levers, a rotating drive shaft, operating members in connection with said type levers, latch members engaging said operating members, means for displacing a latch member whereby its associated operating member is brought into engagement with said drive shaft, means for locking said latch member in displaced position, and means controlled by said displaced latch member for preventing the displacement of another latch member.

18. In a typewriter, a key lever, a type lever, a pull hook in connection with said type lever, a rotating drive shaft, a latch member mounted on said key lever and engaging said pull hook, a locking bar, means on said latch member for engaging said locking bar upon the depression of said key lever, and means on said pull hook for engaging said drive shaft upon the depression of said key lever.

19. In a typewriter, key levers, type levers, pull hooks in connection with said type levers, a rotating drive shaft, latch members mounted on said key levers and engaging said pull hooks, a locking bar, means on said latch members for engaging said locking bar upon the depression of respective key levers, means on said pull hooks for engaging said drive shaft upon the depression of respective key levers, and means controlled by an actuated latch member for preventing the actuation of another latch member.

20. In a typewriter, a key lever, a type lever, a pull hook in connection with said type lever, a rotating drive shaft, a latch member mounted on said key lever and engaging said pull hook, a locking rail beneath said pull hook, hook means on said latch member positioned opposite said locking rail upon the actuation of said key lever, means adapted to rock said latch member and thereby engage said hook means with said locking rail, and means on said pull hook for engaging said drive shaft upon the depression of said key lever.

21. In a typewriter, a type lever, a key lever, a rotating drive shaft, an operating member connected to said type lever, a latch member engaging said pull hook, a lost-motion connection between said latch member and said key lever, a locking rail, and means on said latch member whereby upon the actuation of said key lever said latch member engages said locking rail without retaining said key lever in displaced position.

22. In a typewriter, a type lever, a key lever, a rotating drive shaft, an operating member in connection with said type lever, a latch member pivoted to said key lever and engaging said operating member, whereby upon the actuation of said key lever said latch member is displaced and said operating means is thereby brought into engagement with said shaft for actuating said type lever, a keeper engaged by said latch member in its displaced position, and means for releasing said latch member from said keeper subsequent to the typing stroke of said type lever.

23. In a typewriter, a type lever, a key lever, a rotating drive shaft, an operating member in connection with said type lever, a latch member pivoted to said key lever, and engaging said operating member, whereby upon the actuation of said key lever said latch member is displaced and said operating means is thereby brought into engagement with said shaft for actuating said type lever, a keeper engaged by said latch member in its displaced position, and means on said operating means for releasing said latch member from said keeper subsequent to the typing stroke of said type lever.

24. In a typewriter, a type lever, a rotating drive shaft, an operating member in connection with said type lever, means for adjusting the normal position of said operating member relative to said drive shaft, and means for bringing said operating member into engagement with said drive shaft.

25. In a typewriter, type levers, a rotating drive shaft, pull hooks in connecton with said type levers, means for bringing said pull hooks selectively into engagement with said drive shaft, and an adjustable abutment common to all of said pull hooks for regulating the normal position of said pull hooks relative to said drive shaft.

The foregoing specification signed at Berlin this 29th day of June, 1923.

CARL SCHLÜNS.