

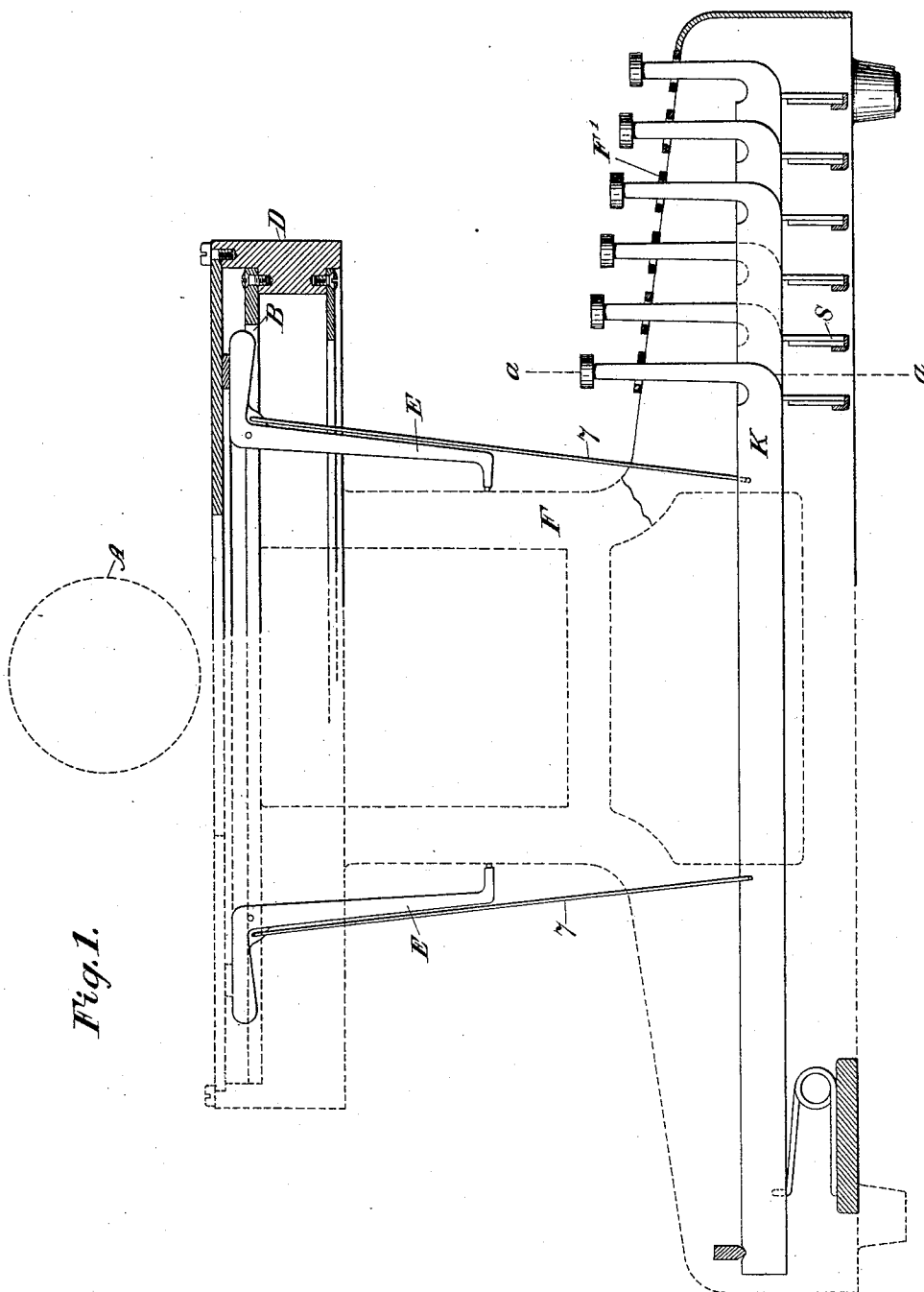
(No Model.)

2 Sheets—Sheet 1.

J. M. FAIRFIELD.
TYPE WRITING MACHINE.

No. 566,302.

Patented Aug. 25, 1896.



Witnesses:
Chas. D. King.
Fred. J. Dole.

Inventor:
John M. Fairfield
By his Attorney,
F. A. Richards.

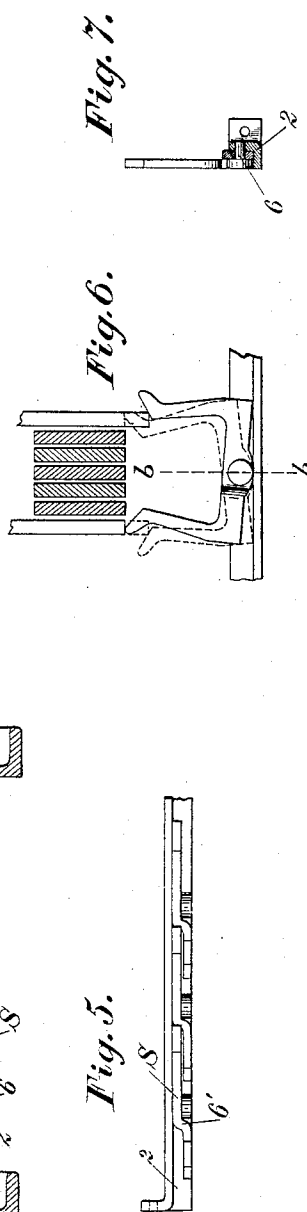
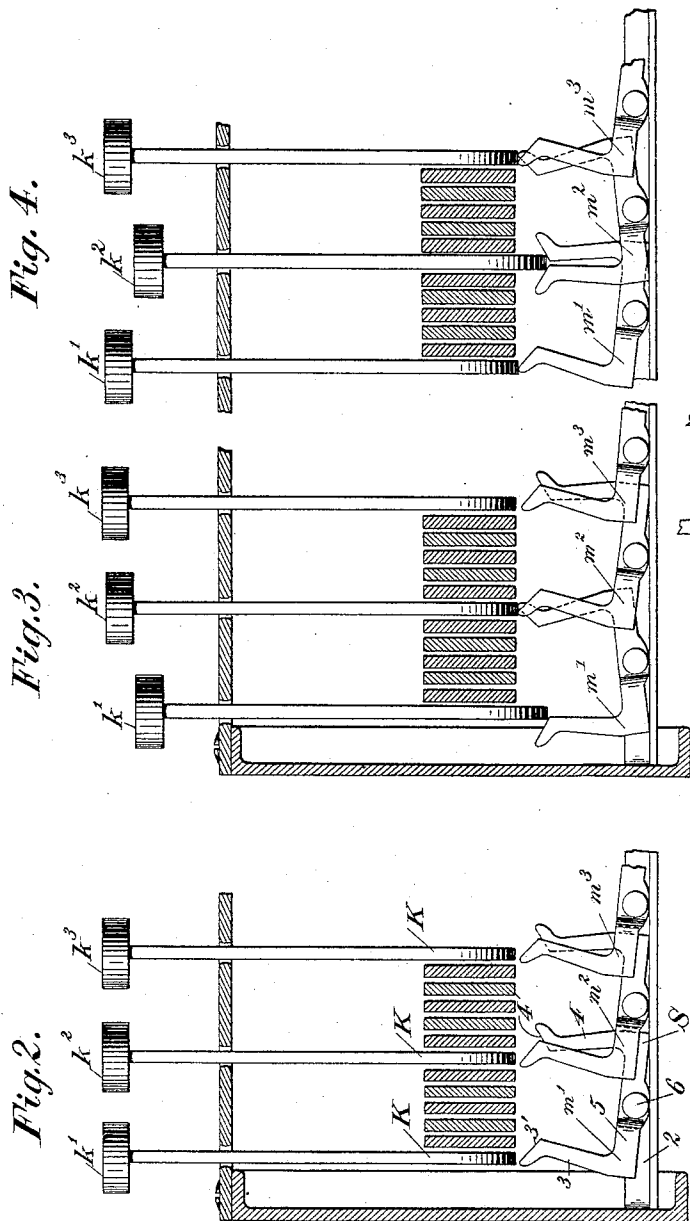
(No Model.)

2 Sheets—Sheet 2.

J. M. FAIRFIELD.
TYPE WRITING MACHINE.

No. 566,302.

Patented Aug. 25, 1896.



Witnesses:
Chas. D. King.
Fred. J. Dole.

Inventor:
John M. Fairfield
By his Attorney,
F. H. Richards.

UNITED STATES PATENT OFFICE.

JOHN M. FAIRFIELD, OF HARTFORD, CONNECTICUT.

TYPE-WRITING MACHINE.

SPECIFICATION forming part of Letters Patent No. 566,302, dated August 25, 1896.

Application filed November 16, 1895. Serial No. 569,128. (No model.)

To all whom it may concern:

Be it known that I, JOHN M. FAIRFIELD, a citizen of the United States, residing at Hartford, in the county of Hartford and State of Connecticut, have invented certain new and useful Improvements in Type-Writing Machines, of which the following is a specification.

My invention relates to type-writing machines of that class having type-bars which are supported to swing toward a common center, and which type-bars are connected with and are actuated by key-levers or key-rods; and the invention more particularly relates to safety-stop devices or locking instrumentalities for the key-levers of the type-bars in type-writing machines of the class specified, and which are adapted for preventing the simultaneous operation of two or more key-levers.

One object of my present invention is to provide, preferably in connection with the keyboard of a writing-machine of the class specified, a simple and effective safety-stop device of suitable construction supported in coöperative relation with two or more key-levers of the machine, and adapted, upon the working stroke of a key-lever, to be actuated by said key-lever and thrown into positive engagement with one or more adjacent key-levers to thereby positively lock said adjacent key-levers against effective movement until the aforesaid actuated key-lever is returned to its normal inoperative position.

Another object of my invention is to provide, in connection with the key-levers of a writing-machine of the class specified, a multiplex safety-stop device comprehending a multiplicity of pivotally-supported coöperative key-lever lockers or tumblers arranged in coöperative relation with the key-levers and adapted, upon the working stroke of one key-lever, for engaging and positively locking those key-levers adjacent to opposite sides of the key-lever operated and for preventing an effecting movement of said adjacent key-levers until the operated key-lever has returned to its normal ineffective position and thereby preventing the accidental jamming together of two type-bars, which would occur if two or more key-levers actuating said type-bars were simultaneously operated.

In the drawings accompanying and forming part of this specification, Figure 1 is a vertical longitudinal section of a portion of a writing-machine of the class specified embodying my present improvements, a portion of the framework of the machine being shown in dotted line and only so much of the operative parts of the machine being shown as is necessary to illustrate the application and mode of operation of my present improvements. The key-lever lockers in this figure are shown in end elevation and in their ineffective or idle positions. Fig. 2 is a relatively large cross-sectional view of a portion of the writing-machine, taken in dotted line *a a*, Fig. 1, this figure showing three key-levers in their normal inoperative positions and showing also a series of key-lever lockers in their operative relations to the key-levers and in positions to be actuated by said key-levers. Fig. 3 is a view similar to Fig. 2, also showing three key-levers and their coöperative lockers and showing the outer one of said key-levers depressed and the adjacent middle key-lever locked against movement by the key-lever locker which was actuated by the depression of the first-mentioned key-lever. Fig. 4 is a view similar to Fig. 3, showing the middle key-lever of the series of key-levers depressed and as having actuated two key-lever lockers to lock the key-levers adjacent to opposite sides of the first-mentioned depressed key-lever. Fig. 5 is a plan view of a portion of the multiple safety-stop device removed. Fig. 6 is a cross-sectional view similar to Figs. 2, 3, and 4, showing one key-lever locker or tumbler in operative relation with two key-levers and showing in full and dotted lines two different positions of said locker. Fig. 7 is a cross-sectional view taken in dotted line *b b*, Fig. 6, and shows the manner of connecting the key-lever or tumbler to its supporting-bar.

Similar characters designate like parts in all the figures of the drawings.

One embodiment of my present invention is for convenience herein shown developed in a type-writing machine, which, in a general way, is similar to the writing-machine described in Letters Patent of the United States No. 536,022, granted to me March 19, 1895, to which reference may be had; but it will be

understood that my invention, in the form thereof herein shown or in such modified forms thereof as do not deviate from said invention, may be practically embodied in other machines than that herein referred to.

The type-writing machine to which my improvements are shown applied comprises in part a suitable framework, which is designated in a general way by F, and which includes the keyboard F'; a type-bar-carrier guide B, which is shown in the form of a plate secured by screws to a ring D, which ring may constitute a part of the framework of the machine; type-bars E, pivotally supported on the carrier-guide B for swinging movement toward a common center and toward the platen A, (shown in dotted lines in Fig. 1,) and key-levers K, which are provided at their forward ends with the usual keys and are supported on the framework of the machine in any suitable manner, said key-levers being shown operatively connected with the type-bars by means of suitable actuating-rods 7, all of which parts may be of substantially the same construction and organization as like parts described in my former patent hereinbefore referred to.

The key-levers K, which may be of any suitable construction and organization, are shown having upward extensions at their forward ends, which constitute stems for the keys which are carried at the upper ends of said extensions. The keys of alternating key-levers of the series of key-levers will in practice be arranged in independent rows and the several rows of keys will extend in the usual manner in substantially parallel lines cross-wise of the keyboard F'.

Inasmuch as the several keys of each row of keys are in construction and organization substantial duplicates of one another and are relatively equidistant in their dispositions, I have for convenience shown in Figs. 2, 3, and 4 only a sufficient number of such keys as will fully illustrate the application and mode of operation of my present improvements, which improvements comprise in part a key-actuated safety-stop device comprehending one or more key-lever lockers shiftably supported in operative relation with two or more key-levers of a row of keys, and a support for said key-lever locker or lockers, as will be hereinafter more fully described.

In the operative views, Figs. 2, 3, and 4, I have shown three key-levers in operative relation with a series of key-lever lockers, certain of said levers and lockers being shown in different positions in the three figures, and the keys thereof are, for convenience in describing the independent operations of the several key-levers and lockers, designated by k^1 , k^2 , and k^3 , respectively.

The safety-stop device, which is designated in a general way by S, and one of which is employed in connection with each row of keys, as illustrated in Fig. 1, consists, in the preferred form thereof, (shown most clearly

in Figs. 2 to 7, inclusive,) of a suitable tumbler-supporting bar 2, adapted to be secured to the framework of the machine below and in a position transversely of the key-levers, and a series of tumblers or key-lever lockers shiftably supported on said supporting-bar in proper position to be engaged and operated by the key-levers when said safety-stop device is assembled in operative position in a writing-machine, only three tumblers or key-lever lockers being shown in connection with the supporting-bar in the figures referred to, and said lockers being designated by m^1 , m^2 , and m^3 , respectively.

In the preferred form thereof herein shown and described the so-called "key-lever lockers or tumblers" are somewhat in the nature of bifurcated or U-shaped levers, each lever consisting of two relatively remote or independent stop-arms 3 and 4, joined together at their inner ends by a cross-bar 5, preferably formed integral therewith. These arms 3 and 4 preferably have their outer end faces oppositely inclined, as shown at 3' and 4', to form cam-like bearing-faces against which the lower faces of the key-levers K may abut when said key-levers are operated, and formed in the cross-bar 5, midway between the two arms 3 and 4, is a pivot-bearing through which the pivot 6, that pivotally secures the tumbler or locker to the supporting-bar 2, is extended, as will be readily understood by reference to Figs. 3 to 7, inclusive, of the drawings.

As will be seen by reference to Fig. 6 of the drawings—which figure shows one key-lever locker in operative relation to two key-levers—the two stop-arms 3 and 4 of each key-lever locker or tumbler are separated transversely, one from the other, by a distance substantially equal to the distance between two key-levers, and each locker is pivotally supported below and at a point midway between two adjacent key-levers of the same row of key-levers, so that upon the operation of one key-lever one of the stop-arms 3 and 4 of the locker operated by this lever will be depressed, which will throw the other stop-arm upward into engagement with and prevent the accidental depression of the next adjacent key-lever of this row of key-levers until the first-mentioned key-lever is returned to its normal idle position.

For the purpose of dead-locking a number of key-levers upon the depression of one key-lever, and more particularly for the purpose of dead-locking the key-levers adjacent to opposite sides of that key-lever depressed, I preferably employ a stop device of multiplex character in operative relation with each row of keys of the writing-machine and comprehending a multiplicity of key-lever lockers, which are organized in such cooperative relations relatively to each other, and in such cooperative relation with the several key-levers of the so-called "row" of key-levers, that upon the depression of any one key-lever—other than the end key-lever of the row—two

key-lever lockers will be simultaneously operated by the key-lever depressed and will temporarily dead-lock the key-levers at opposite sides of the key-lever depressed.

5 For the purpose of assembling the key-lever lockers in the required coöperative position upon the key-lever-supporting bar 2, and for the purpose of securing a compact structural organization of the parts constituting
10 the safety-stop device, and also for the purpose of securing perfect freedom in the movements in the key-lever lockers, the cross-bars 5 of the lockers—which lockers are preferably constructed of sheet metal and are of uniform
15 thickness throughout—are bent sidewise, as shown at 6', Fig. 5, at one side of the pivotal point thereof to bring the two arms 3 and 4 thereof in different vertical planes, and the adjacent ends of the adjacent lockers overlap
20 one another in such manner that the bearing-faces of the overlapping arms of said lockers will be located in juxtaposition to and will be in position to be operated by the same key-lever, as will be understood by a comparison of Figs. 2, 3, and 4 of the drawings.

From the foregoing description and by a comparison of Figs. 2, 3, and 4 of the drawings it will be seen, assuming the key-lever lockers and keys to be in their normal positions, (shown in Fig. 2,) that if a key, as k' ,
30 is depressed the lower face of the key-lever K thereof will strike the cam-like face 3' of the stop-arm 3 of the key-lever locker m' , shifting this key-lever locker from the position shown in Fig. 2 to that shown in Fig. 3,
35 and throwing the stop-arm thereof, with its cam-like face 4', into engagement with the key-lever of the key k^2 , thus dead-locking this key-lever against movement until the
40 key k' is returned to its normal idle position, the movement of the key-lever or member locker also being limited in this particular construction of safety-stop device by the engagement of the end of the locker cross-
45 bar 5 with the lower wall of the support 2 on the depression of that particular end by one of the keys, although it will be understood that the engagement of one of the cam-faces, as 4', Fig. 2, of one of the stop-arms with a
50 non-depressed key, when its companion stop-arm is depressed, will also limit the shifting movement of the locker, so that the stop device constructed by the support 2 can be done away with. Then if the key k^2 is depressed,
55 assuming the key-lever lockers to be in the position shown in Fig. 3, the lower face of the key-lever of said key k^2 will strike the cam-like faces of the two overlapped arms 4 and 3 of the key-lever lockers m' and m^2 , respectively,
60 shifting them from the position shown in Fig. 3 to that shown in Fig. 4 and throwing the arms 3 and 4 of the lockers m' and m^2 , respectively, into the dead-locking positions relatively to the key-levers of the two keys k' and
65 k^2 , and thereby locking the levers of said two

keys against movement until the key k^2 , intermediate to said keys k' and k^2 , is returned to its normal idle position.

In practice the tumbler-supporting bar 2, which constitutes one member of the safety-
70 stop device, will preferably be of rectangular form in cross-section—usually L-shaped, as illustrated in the drawings—and the tumblers will be pivotally secured to said bar in
75 such manner that one side of said bar will constitute a stop for limiting the working strokes of the tumblers by permitting the ends of the locker cross-bar 5 to engage and rest upon the same.

As will be understood from the foregoing
80 description and by reference to the drawings, the safety-stop device S constitutes a unitary article of commerce adapted to be applied in an assembled and operative relation with a
85 series of key-levers of any ordinary type-writing machine in which the keys of the keyboard are arranged in rows. Said safety-stop device as a unitary structure consists, in the form thereof shown in Fig. 5 of the
90 drawings, of one or more pairs of key-lever lockers and a suitable support for said key-lever, and each pair of key-lever lockers having two opposing stop-faces located in
95 juxtaposition with each other below and in position to be simultaneously engaged by one key-lever when depressed—assuming the stop device to be assembled in working position in a type-writing machine—to throw the
100 opposite end of one locker of the pair of lockers into engagement with a key-lever located at one side of the depressed key-lever and the opposite end of the adjacent locker into engagement with another key-lever located at
105 the opposite side of the depressed key-lever to thereby lock the key-levers adjacent to each side of the depressed key-lever simultaneously with the depression of said key-lever.

Having thus described my invention, what I claim is—

1. In a locking device for type-writing keys,
110 the combination of key members and a pivotally-supported bifurcated lever in position to be engaged by said key members.

2. In a locking device for type-writer keys, the combination of two key members; and a
115 pivotally-supported key-member locker having two upwardly-extending independent and separated stop arms or levers in position to be engaged by said key members.

3. In a locking device for type-writer keys,
120 the combination of two key members; a shiftably-supported key-member locker having two independent and separated, oppositely-inclined stop-faces disposed below, and in operative relation, respectively with, the two
125 key members.

4. A safety-stop device for the keys of a type-writing machine, it comprising a key-member-locker support and one or more key-
130 lockers pivotally carried upon said support,

and each locker having a pair of independent and separated stop-arms disposed, one arm on each side of the pivotal point thereof.

5 5. The herein-described safety-stop device for key-lever-actuated type-writing machines, it consisting of a suitable key-lever-locker support; and a series of key-lever lockers pivotally carried on said support, and each having a pair of cam-faced stop-arms, 10 one stop-arm of one locker being in juxtaposition to, and overlapping the adjacent stop-arm of, an adjacent locker.

6. The herein-described multiplex safety-stop device for the key-levers of a type-writing machine, it consisting of a supporting-bar 15 and a multiplicity of shiftable key-lever lockers pivotally supported on said bars, and each having two oppositely-disposed stop-faces located, respectively, at opposite sides 20 of the pivotal point of said locker, and said lockers having their adjacent ends in overlapping relation.

7. The herein-described safety-stop device for key-levers of machines of the class specified, it comprising a suitable support; and 25 one or more key-lever lockers in shiftable connection with said support, and each locker having two stop-arms located in different planes, respectively, and each stop-arm having an inclined stop-face at the free end 30 thereof.

8. The combination with two key-levers, in a machine of the class specified, of a key-lever locker having a pivotal support between 35 and below said key-levers, and having two oppositely-inclined stop-faces located, respectively, at opposite sides of the pivotal point and in relatively different planes.

9. In a machine of the class specified, the 40 combination with a row of key-levers, and with the framework of the machine; of a lever-

locker-supporting bar secured to the framework below the key-levers, and in a plane intersecting the plane of movement of said key-levers; a series of key-lever lockers pivotally supported on said bar with their adjacent 45 ends in different planes and in overlapping relation, and each locker having two upwardly-projecting stop-arms, with oppositely-inclined stop-faces at their upper ends 50 located, respectively, in the plane of movement of two independent key-levers.

10. The herein-described safety-stop device for the key-levers of type-writing machines, it consisting of a cross-sectionally angular 55 locker-supporting bar having a series of pivot-bearings in one wall thereof; a series of U-shaped key-lever lockers pivotally supported midway of their width above one wall of the locker-supporting bar on pivots seated in the 60 pivot-bearings in the other wall of the supporting-bar, and having their adjacent ends in overlapping relation.

11. In a type-writing machine, the combination with two key-levers, of a rockable 65 key-lever locker having two stop-arms connected together at one end by a cross-bar, and having oppositely-disposed stop-faces at their free ends located, respectively, in the path of movement of the two key-levers; a 70 locker-supporting bar having two rectangularly-disposed walls, one of which constitutes the support for the key-lever lockers, and to which said key-lever locker is pivoted, and the other of which constitutes a stop-wall, for 75 limiting the rocking movement of said key-lever locker.

JOHN M. FAIRFIELD.

Witnesses:

FRED. J. DOLE,
FREDERICK A. BOLAND.