

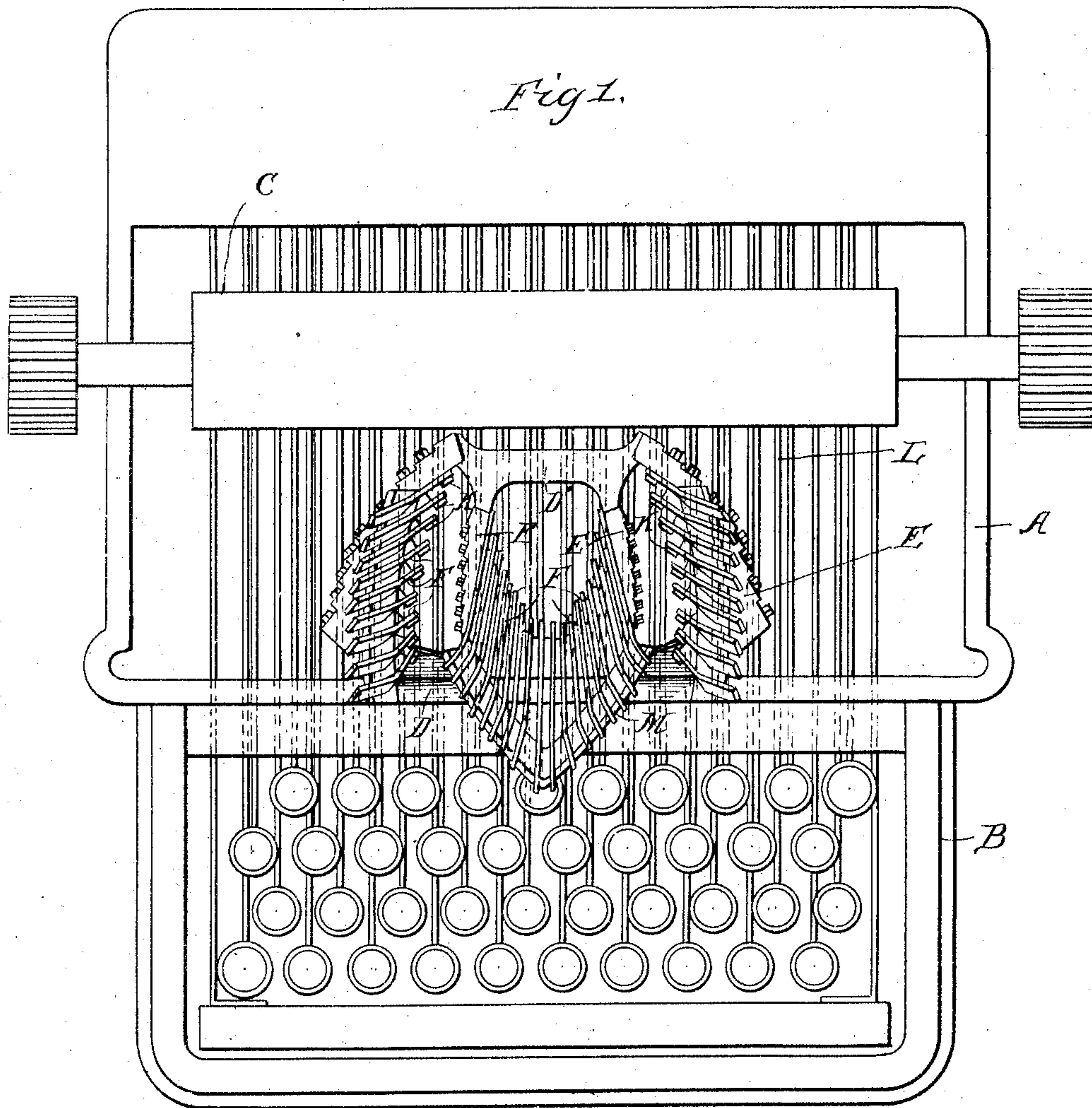
No. 874,057.

PATENTED DEC. 17, 1907.

H. L. FISHER.  
TYPE WRITER.

APPLICATION FILED FEB. 23, 1899. RENEWED JUNE 17, 1907.

2 SHEETS—SHEET 1.



Witnesses.  
Wm. M. Rheem.  
*[Signature]*

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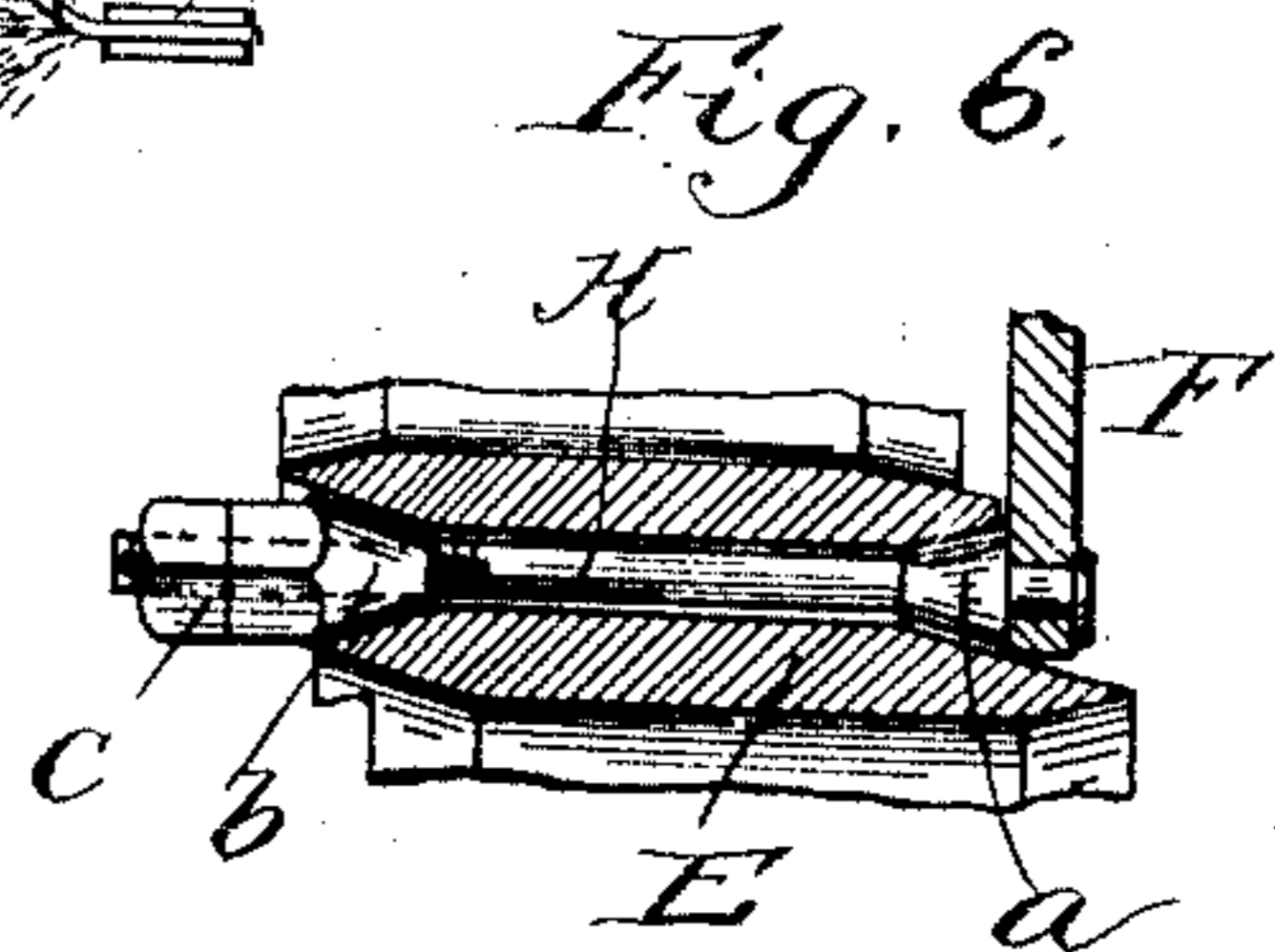
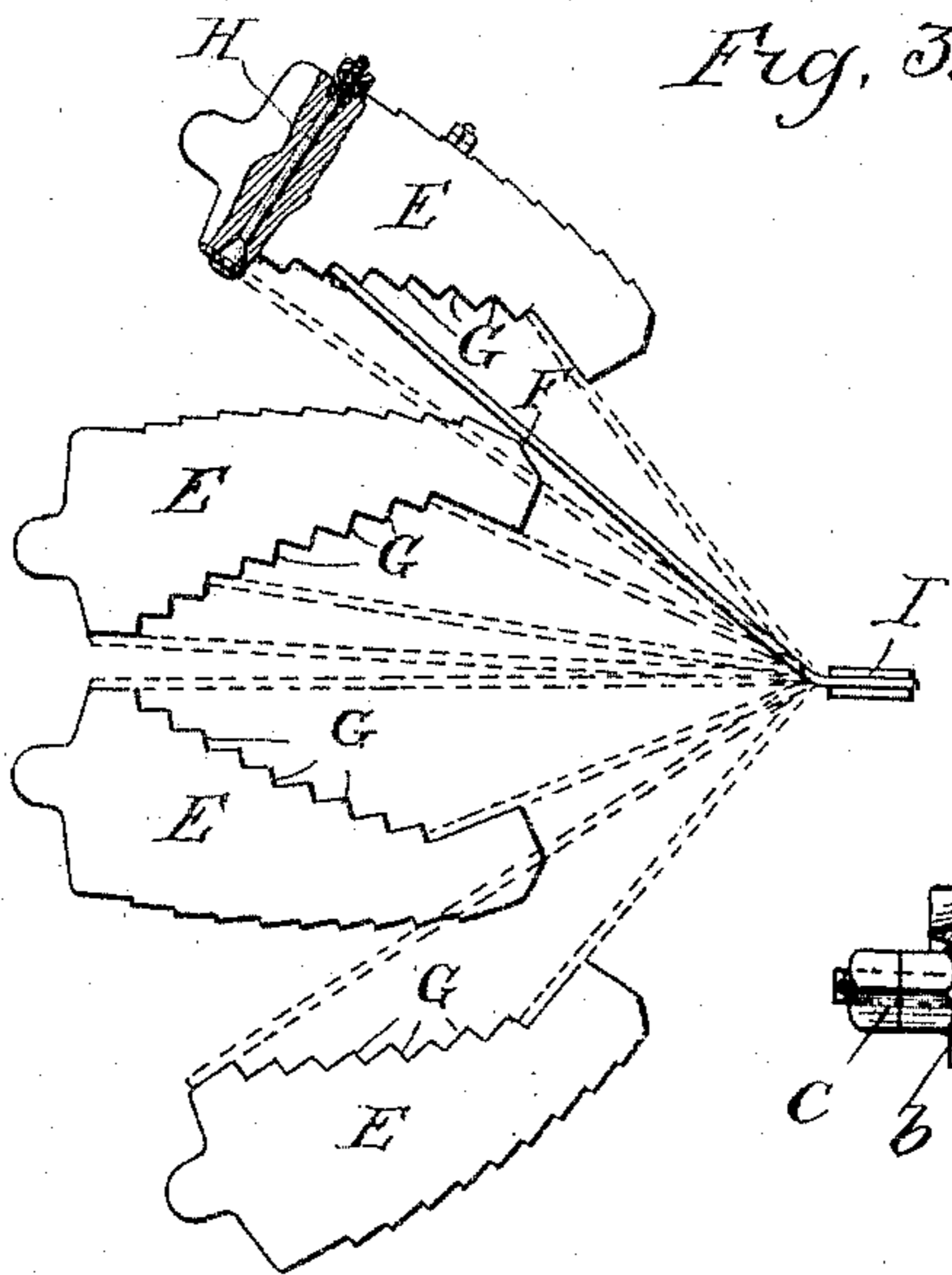
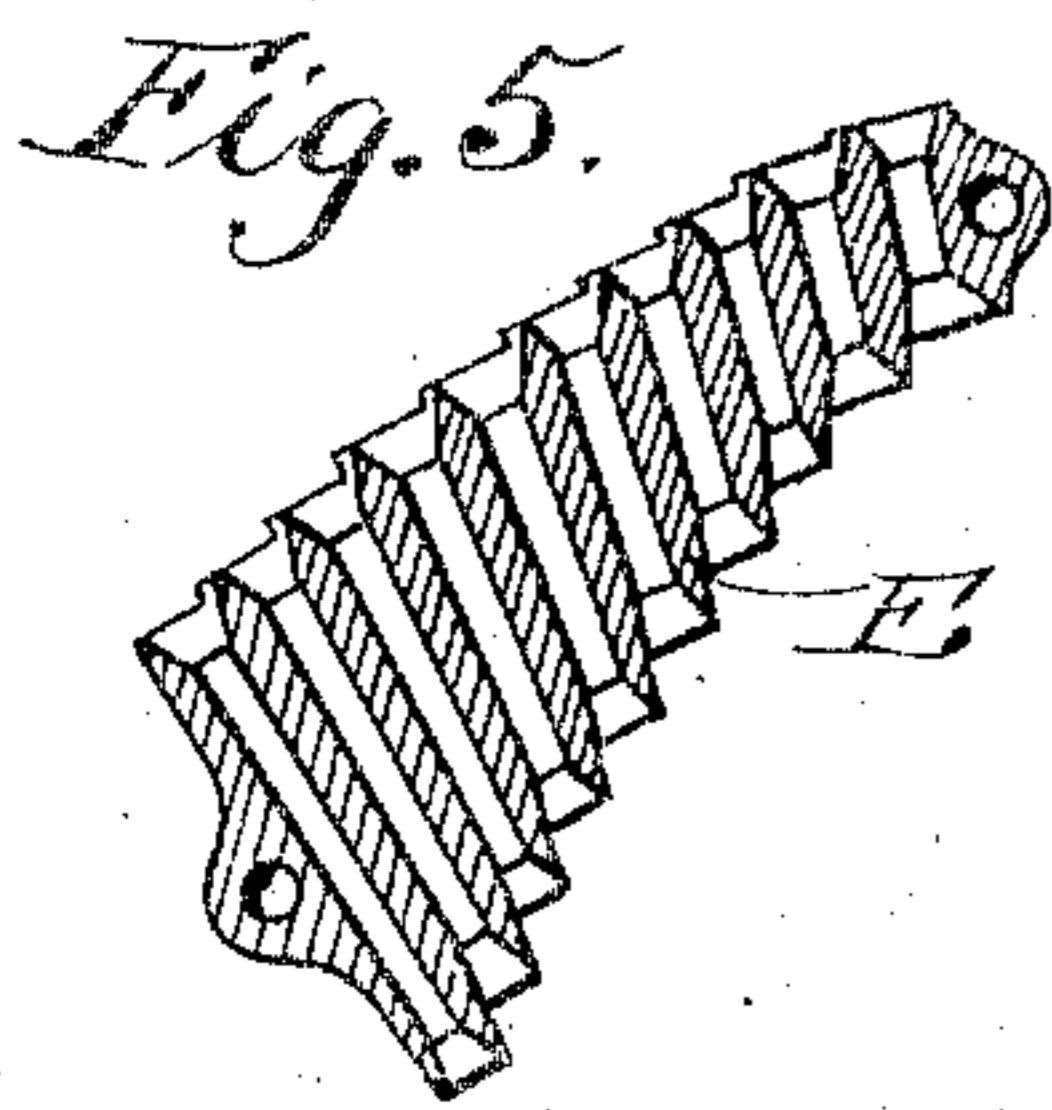
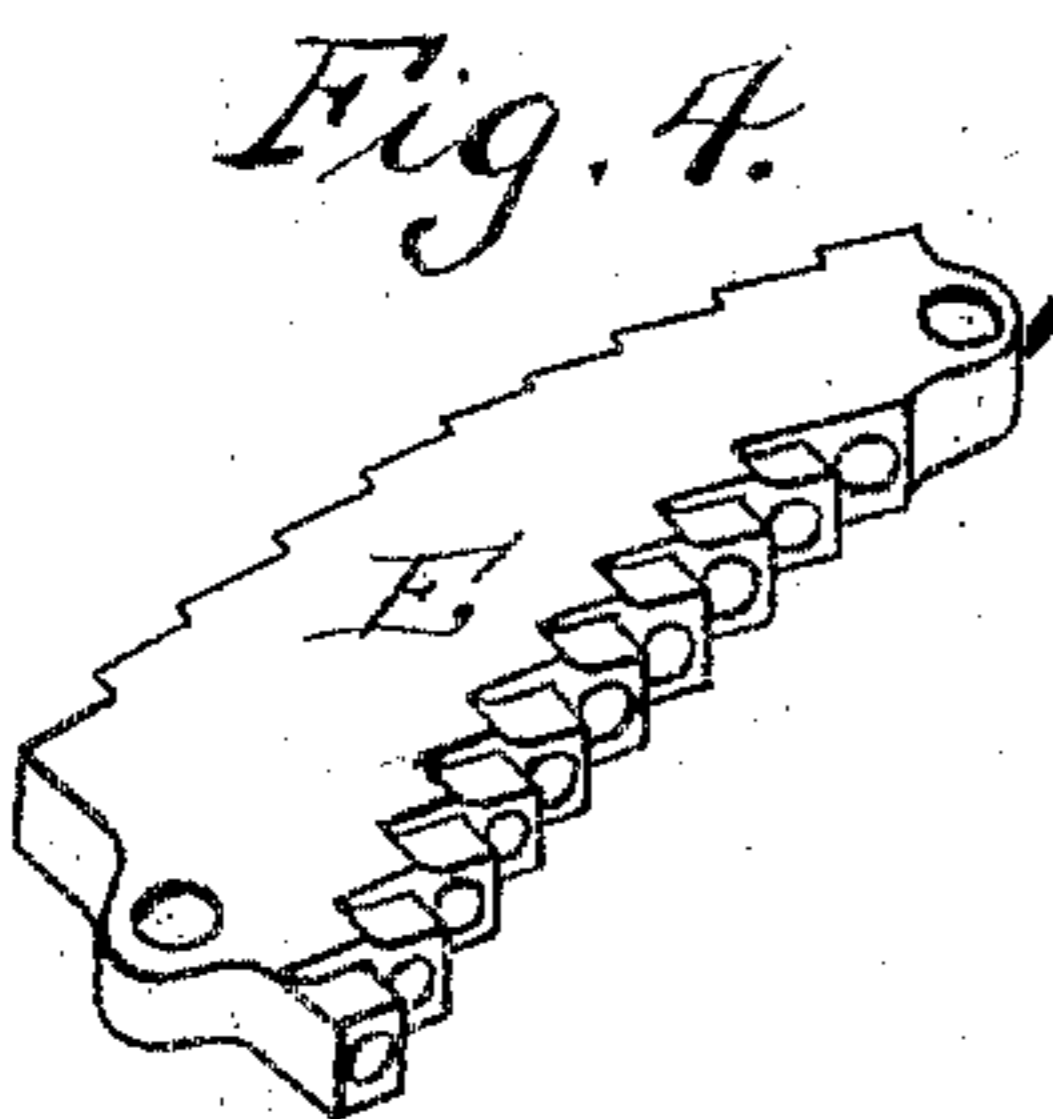
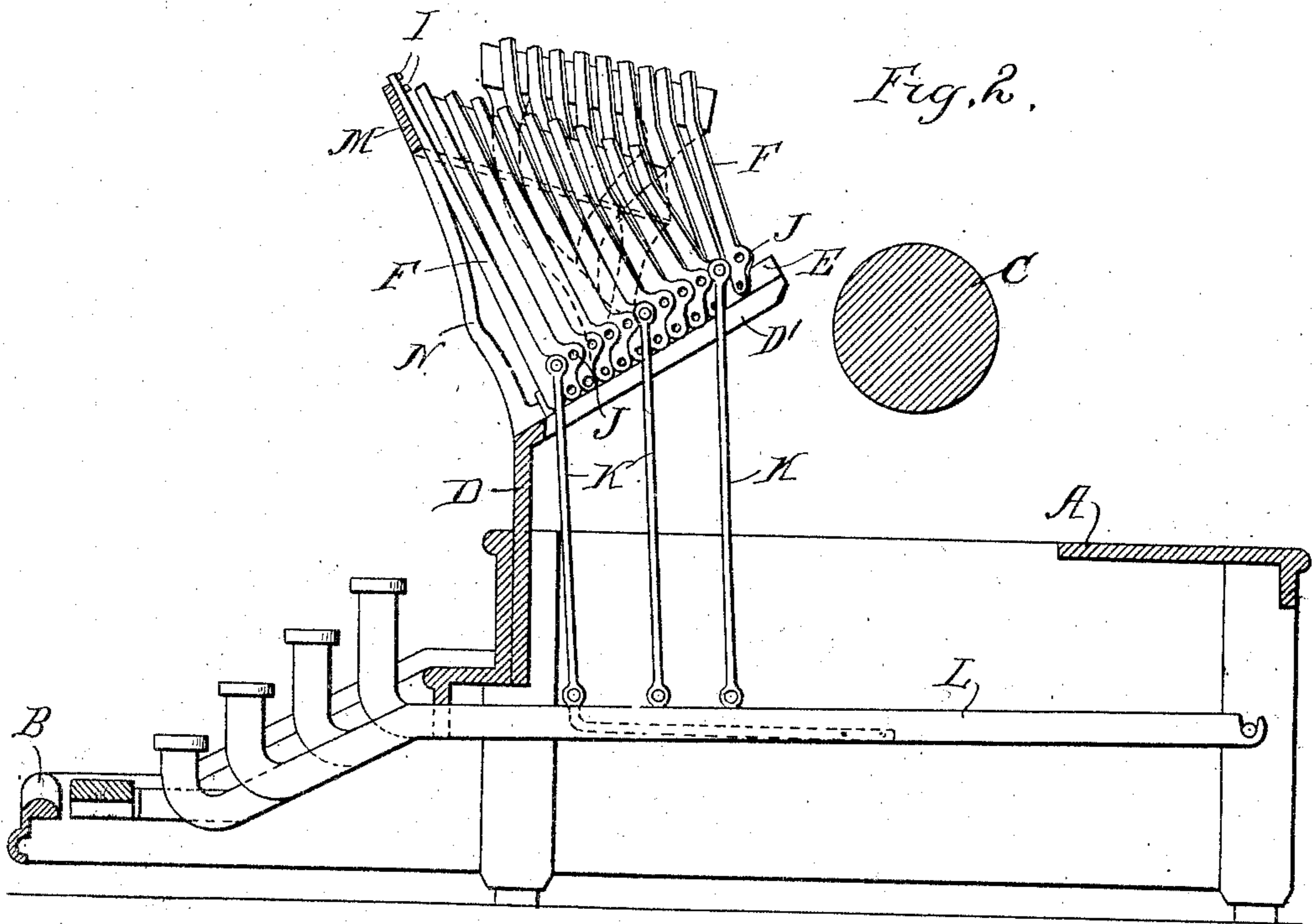
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2 SHEETS—SHEET 2.



Witnesses  
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H. B. Burt

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# UNITED STATES PATENT OFFICE.

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## TYPE-WRITER.

No. 874,057.

Specification of Letters Patent.

Patented Dec. 17, 1907.

Original application filed October 13, 1898, Serial No. 693,442. Divided and this application filed February 23, 1899, Serial No. 706,481. Renewed June 17, 1907. Serial No. 379,493.

*To all whom it may concern:*

Be it known that I, HARVEY L. FISHER, a citizen of the United States, residing at Woodstock, in the county of McHenry and State of Illinois, have invented certain new and useful Improvements in Type-Writers, of which the following is a specification.

This application is a division of the application filed by me on October 13, 1898, Serial No. 693,442, and only so much of the complete machine shown in said prior application will be here illustrated and described as may be necessary for an explanation of the portion of my invention intended to be covered by the present application.

The invention relates to what are commonly called visible writing machines, in which the matter written is visible to the operator letter by letter as it proceeds, and it has for its object, first, a novel and compact arrangement of the type-bars in front of the platen, in such position that when operated the types will strike upon the top of the platen, and when in normal position not obstruct the operator's view of the writing as it proceeds letter by letter, and second, the provision of novel and efficient supporting bearings for said type-bars; all as will be hereinafter more fully explained.

In the accompanying drawings Figure 1 is a top plan view of so much of my new machine as is necessary to illustrate the present invention; Fig. 2 a middle vertical section; Fig. 3 a top plan view of the bearing plates which support the type-bars; Fig. 4 a detail perspective view of one of said bearing plates; Fig. 5 a sectional plan view of the same, showing the transverse bores through which the type-bar axles pass; and Fig. 6 an enlarged sectional detail of the same showing one of the type-bar axles and its bearings in said plate.

The same letters of reference are used to indicate like parts in the several views.

The main frame A of the machine is in the present instance of rectangular form in plan view, and provided with a forward extension B to accommodate the key-board, as shown in Fig. 1.

The platen C extending across the machine is mounted in a transversely movable paper carriage, not shown, and is also capable of backward and forward movement for the printing of upper and lower case charac-

ters, as fully described in the aforesaid pending application.

Secured to the main frame of the machine in front of the platen is a vertical bracket plate D which is provided with an upwardly and rearwardly inclined extension D' constituting the support for the bearing plates E in which the axles of the type-bars are journaled. The extension D' of the supporting plate D is of skeleton form, or provided with openings between the several bearing plates E, to accommodate the type-bars and the depending rods which connect them with the key-levers. The bearing plates E in the present instance are four in number, and are secured to their support D' by screws passed through them and entering said support.

The type-bars F are secured at their lower ends to the inner ends of axles H which extend through and have their bearings in transverse bores in the plates E, and are operated by the key-levers L through the medium of the rods K connected at their lower ends to said key-levers and at their upper ends to rearwardly projecting ears J upon the lower ends of the type-bars. When the front end of any key-lever is depressed the corresponding type-bar will be swung rearward and downward and the type carried by its outer end caused to strike the upper forward side of the platen, and when the key-lever is released the bar will be returned to normal position by the action of the usual springs. In normal position, Fig. 2, the upper ends of the type-bars bear against a type-rest M carried by supporting arms N secured at their lower ends to the bracket plate D D'.

The bearing plates E, in which the type-bar axles are journaled, are inclined upwardly and rearwardly in front of the platen, being secured to the inclined extension D' of the supporting bracket plate D, as heretofore stated, and are grouped in relation to each other as shown in Fig. 3. This arrangement of the plates E serves several purposes, one of which is that it permits the longer type-bars, at the forward end of each group, to be supported in lower position than the shorter bars at the rear end of the group, and thereby prevent them from obstructing the operator's view of the printing line upon the platen. Another is that it permits of the types striking the platen upon its upper forward

ward side, at an angle of about 45 degrees, instead of striking either directly in front or directly upon the top of the same, as heretofore, and at the same time brings the pivots of the type-bars to substantially the same plane as that in which the types strike the platen, so that when a type-bar is swung rearward and downward until its type strikes the platen the bar lies in approximately the plane occupied by the pivots of all of the bars. The arrangement under which the types strike the platen upon its upper forward side, instead of directly in front or directly on top of it, brings the printing line into a plane at right angles to the line of vision, where it can be more readily and distinctly seen than directly in front or directly on top of the platen. Still another purpose served by the arrangement of the bearing plates referred to is that it facilitates a proper connection of the upper and rearward type-bars in each group with their operating key-levers located out of the vertical planes of such bars. The lower and forward type-bars in each group are connected by their rods K with the key-levers most directly beneath them, while the upper rearward bars of each group are connected with the key-levers at one side of their vertical planes, and their rods K therefore extend downwardly and outwardly from their points of connection with the type-bars to their points of connection with the key-levers, and the inclination and grouping of the bearing plates E referred to enables the rods K connecting the upper and rearward type-bars with their key-levers to be located in approximately the planes of movements of the type-bars and to therefore transmit the force applied to the key-levers more directly and with less resistance to the type-bars than if the bearing plates were located in a horizontal plane and grouped otherwise than as shown.

The bodies of the type-bars F are flat (being conveniently struck from sheet steel) and they are secured to their axles H at right angles to the latter, as shown in Figs. 3 and 6. They are, or may be, also perfectly straight (preferably slightly tapering in width toward their outer ends) but in the present instance, in order to enable the plates E to be located as close together as possible, several of the longer bars at the forward ends of the two outside groups are sufficiently curved (in their plane of movement) to enable them to strike over the rear ends of the two inner plates E when operated, as indicated by the dotted lines in Fig. 3, without coming in contact with said plates. In respect, however, to their connection with their axles H at right angles to the latter all of the type-bars F are "straight" in the sense that their bodies extend in straight lines from their axles to their common point

of convergence, as shown in Fig. 3, and it is in this sense that the word "straight" is used in referring to the type-bars in the annexed claims. Being straight in this respect it is not material whether more or less of them be curved in their planes of movement, as in the case of the longer bars of the outer sets above referred to.

To permit the straight type-bars to converge at a common point, as indicated in Fig. 3, and at the same time to be secured to their respective axles H at right angles to the latter, said axles in each group are arranged in non-parallel order, or at slight angles to each other, their outer ends being separated from each other slightly more than their inner ends, the transverse bores in the plates E, in which the axles have their bearings, being arranged as shown in Fig. 5 for this purpose. The extreme outer ends of the type-bars F are bent at angles to the bodies of the bars, the angles of the bent portions to the bodies so varying, according to the different positions of the bars, that when a bar is operated and its outer end thrown rearward and downward against the platen its bent end will lie at right angles to the axis of the platen, as shown in Fig. 3. To these bent extremities of the bars F are secured the type-blocks I, each bearing a lower and upper case character, the former being adapted to strike the platen when the platen is in its forward or normal position, and the latter when the platen is in its shifted or upper case position.

Each bearing plate E is provided along its inner edge with a series of notches or offsets G, one for each type-bar F. The inner or side faces of these notches or offsets G on each plate stand at a slight angle to each other and converge toward the common point of convergence of the type-bars F, Fig. 3. The transverse bores in each plate E, in which the axles H of the type-bars have their bearing, extend at right angles from these side faces of the respective notches G through the plate E to its outer edge, where they terminate in short flat surfaces formed upon the outer edge of the plate parallel with the side faces of the respective notches G upon the inner edge of the plate. The bores in the plates E are countersunk at their opposite ends to receive conical bearings upon the axles H. These bearings *a* at the inner ends of the axles H are formed directly upon the axles, and their outer flat surfaces form shoulders against which the ends of the type-bars are riveted by hammering down the reduced end of the axle H which projects beyond the bearing *a* through an eye formed in the end of the type-bar, Fig. 6. The opposite or outer ends of the axles H are threaded to receive conical bearing nuts *b* and lock nuts *c*. The bodies of the transverse bores in the plates E are of slightly larger diameter than the axles H, so that the axles do not

bear against the walls of the bores but have their bearings at the opposite ends of the bores only, where the cones *a b* engage the countersunk ends of the bores.

5 By loosening the lock nuts *c* upon the outer ends of the axles the bearings may be adjusted as desired by turning the cones *b*, and be then securely maintained in adjusted position by tightening up the lock nuts *c*.

10 In the present instance the plates *E* are tapered from their forward toward their rear ends, so that the transverse bores and type-bar axles gradually decrease in length toward the rear ends of the plates. The de-

15 sideratum is to give the type-bar axle a bearing of maximum length (or bearings at a maximum distance apart) proportionate to the length of the type-bar, so that any play in the bearings, caused by wear or imperfect

20 adjustment, will have a minimum effect upon the type-bar and alinement of the types. In the construction shown in the drawings the longest type-bars are provided with the longest axles, having their bearings the

25 greatest distance apart, and as the lengths of the type-bars gradually decrease the lengths of their axles and the distance between the bearings of such axles are gradually decreased, so that the ratio of length of bearing

30 to length of bar is substantially maintained, and the shorter axles of the shorter type-bars serve to preserve the alinement of those bars as efficiently as do the longer axles of the longer bars. The shape given the plates *E*

35 in the drawings permits a somewhat more compact arrangement of them than if their rear ends were as wide as their front ends.

Under the construction and arrangement of parts above described a maximum number

40 of type-bars are compactly arranged in a minimum space consistently with perfect clearance of the bars and non-interference of them with each other during rapid operation of the machine; they are normally out of

45 the line of vision from the operator's eyes to the printing line upon the platen and therefore do not obstruct his view of the writing as it proceeds letter-by-letter; their pivotal supports have wide bearings proportionate

50 to the lengths of the bars themselves, so that a given amount of play in the bearings of the bars permits a minimum amount of play of the bars themselves, and consequently interferes to a minimum degree with

55 the proper alinement of the types; their bearings are of such form as to produce slight friction and to resist wear, while the provision made enables them to be perfectly adjusted in the first instance and to be readily

60 readjusted to take up such wear as may occur; the type-bars themselves, consisting of thin straight bars simply bent at one extremity, may be struck from sheet steel and be of minimum weight in proportion to maximum

65 strength and rigidity; while the employment

of the separate bearing plates *E* in conjunction with the type-bars and bearings described enables these parts to be assembled independently of the remainder of the machine, and simplifies and reduces the cost of 70 production of these elements of a typewriter.

While it is highly desirable, both from a manufacturing and an operating standpoint, to employ straight type-bars secured to non-parallel axles at right-angles thereto and con- 75 verging to a common point, as herein described, nevertheless, some of the advantages of my invention may be attained by the employment of parallel axles and type-bars

secured thereto and so curved or bent as to 80 cause their types to strike at a common point; and in another pending application filed by me on April 6, 1897, and bearing Serial Number 631,037, I have illustrated and described

the employment of such type-bars and parallel axles. 85

Having described my invention, what I claim and desire to secure by Letters Patent is

1. In a typewriting machine, the combination of the bearing plates located in front of the platen and provided with the transverse bores having countersunk ends, the type-bar axles extending through said bores and provided at their opposite ends with bearing 95 cones fitting the countersunk ends of the bores, said cones at one end of the axles being adjustable thereon, the type-bars secured to the opposite ends of the axles, and key-levers and connections for operating 100 the type-bars, substantially as described.

2. In a typewriting machine, the combination of the bearing plates located in front of the platen and provided with the transverse bores having countersunk ends, the type- 105 bar axles extending through said bores and provided at their opposite ends with cones fitting the countersunk ends of the bores, said cones at one end of the axles being screwed upon the ends of the axles and held 110 in position by lock nuts, the type-bars secured to the opposite ends of the axles, and key-levers and connections for operating said type-bars, substantially as described.

3. In a typewriting machine, the combination of the bearing plates located in front of the platen and provided with the transverse non-parallel bores, the type-bar axles extending through said bores and having their bearings in said plates, the straight type- 120 bars secured to the ends of said axles at right-angles thereto and converging toward a common point, and key-levers and connections for operating said type-bars, substantially as described. 125

4. In a typewriting machine, the combination of the bearing plates located in front of the platen and provided with the transverse non-parallel bores, the type-bar axles extending through said bores and having their 130

bearings in said plates, the type-bars secured to the ends of said axles at right-angles thereto and having straight bodies provided with angular extremities for the reception of double case characters, and key-levers and connections for operating said type-bars, substantially as described.

5. In a typewriting machine, the combination of the bearing plates located in front of the platen and provided with the transverse non-parallel bores having countersunk ends, the type-bar axles extending through said bores and provided with cones fitting the countersunk ends of the bores, said cones at one end of the axles being adjustable thereon, the straight type-bars secured to the opposite ends of said axles at right-angles thereto, and key-levers and connections for operating said type-bars, substantially as described.

6. In a typewriting machine, the combination of the bearing plates located in front of the platen and provided with the transverse non-parallel bores having countersunk ends, the type-bar axles extending through said bores and provided with cones fitting the countersunk ends of the bores, said cones at one end of the axles being screwed upon the ends of the axles and secured by lock nuts, the straight type-bars secured to the opposite ends of said axles at right-angles thereto, and key-levers and connections for operating said type-bars, substantially as described.

7. In a typewriting machine, the combination of the bearing plates located in front of the platen and provided with the non-parallel transverse bores having countersunk ends, the type-bar axles extending through said bores and provided with cones fitting the countersunk ends of said bores, said cones at one end of the axles being adjustable thereon, the type-bars secured to the opposite ends of said axles at right-angles thereto and having straight bodies provided with angular extremities to receive upper and lower case characters, and key-levers and connections for operating said type-bars, substantially as described.

8. In a typewriting machine, the combination of the bearing plates located in front of the platen and provided with the non-parallel transverse bores having countersunk ends, the type-bar axles extending through said bores and provided with cones fitting the countersunk ends of said bores, said cones at one end of the axles being screwed upon the ends of the axles and held by lock nuts, the type-bars secured to the opposite ends of said axles at right-angles thereto and having the straight bodies provided with angular extremities to receive upper and lower case characters, and key-levers and connections for operating said type-bars, substantially as described.

9. In a typewriting machine, the combination of a series of sets or groups of type-bar axles mounted in an inclined plane in front of the platen and provided at their opposite ends with cones fitting in cone-shaped bearings, the cones at one end of the axles being adjustable thereon, type-bars secured to the opposite ends of said axles, and key-levers and connections for operating said type-bars, substantially as described.

10. In a typewriting machine, the combination of a series of sets or groups of type-bar axles mounted in an inclined plane in front of the platen and provided at their opposite ends with cones fitting in cone-shaped bearings, the cones at one end of the axles being screwed upon the axles and held by lock-nuts, type-bars secured to the opposite ends of said axles, and key-levers and connections for operating said type-bars, substantially as described.

11. In a typewriting machine, the combination of a series of sets or groups of non-parallel type-bar axles mounted in front of the platen in a plane inclined downwardly and forwardly from the printing point, straight type-bars secured to the ends of said axles and converging toward a common point, and key levers and connections for operating said type-bars, substantially as described.

12. In a typewriting machine, the combination of a series of sets or groups of non-parallel type-bar axles mounted in front of the platen in a plane inclined downwardly and forwardly from the printing point, type-bars secured to the ends of said axles at right angles thereto and having straight bodies with angular extremities to receive upper and lower case characters, and key levers and connections for operating said type-bars, substantially as described.

13. In a typewriting machine, the combination of a series of sets or groups of non-parallel type-bar axles mounted in front of the platen in a plane inclined downwardly and forwardly from the printing point and provided at their opposite ends with cones fitting in suitable bearings, the cones at one end of the axles being adjustable thereon, straight type-bars secured to the ends of said axles and converging toward a common point, and key levers and connections for operating said type-bars, substantially as described.

14. In a typewriting machine, the combination of a series of sets or groups of non-parallel type-bar axles mounted in front of the platen in a plane inclined downwardly and forwardly from the printing point and provided at their opposite ends with cones fitting in suitable bearings, the cones at one end of the axles being adjustable thereon, type-bars secured to the ends of said axles at right angles thereto and having straight bodies with angular extremities to receive upper

and lower case characters, and key levers and connections for operating said type-bars; substantially as described.

15. In a typewriting machine, the combination of the bearing plates E provided with the transverse bores, the type-bar axles H extending through said bores and having their bearings in the plates E, the type-bars F secured to the ends of the axles H, the key-levers L, and the rods K connecting said key-levers and type-bars, substantially as described.

16. In a typewriting machine, the combination of the bearing plates E provided with the non-parallel transverse bores, the type-bar axles H extending through said bores and having their bearings in the plates E, the straight type-bars F secured to the ends of the axles H at right angles thereto and converging toward a common point, the key-levers L, and the rods K connecting said levers and type-bars, substantially as described.

17. In a typewriting machine, the combination of the bearing plates E having the non-parallel transverse bores, the type-bar axles H extending through said bores and having their bearings in the plates E, the type-bars F secured to the ends of the axles H at right-angles thereto and having straight bodies converging toward a common point, with the angular extremities to receive the type-blocks I, the key-levers L, and the rods K connecting said levers and type-bars, substantially as described.

18. In a typewriting machine, the combination of the bearing plates E provided along one edge with the notches or offsets G and having the transverse bores extending through the plates from the side faces of the notches G, said bores having countersunk ends, the type-bar axles H extending through said bores and provided with the cones *a b* fitting the countersunk ends of said bores, the cones *b* being screwed upon the ends of the axles, and the type-bars F secured to the opposite ends of said axles, substantially as described.

19. In a typewriting machine, the combination of the bearing plates E provided along one edge with the notches or offsets G and having the transverse bores extending through the plates from the side faces of the notches G, said bores having countersunk ends, the type-bar axles H extending through said bores and provided with the cones *a b*

fitting the countersunk ends of said bores, the cones *b* being screwed upon the ends of the axles and held by lock nuts *c*, and the type-bars F secured to the opposite ends of said axles, substantially as described.

20. In a typewriting machine, the combination of the bearing plates E provided along one edge with the notches or offsets G having non-parallel side faces converging toward a common point, said plates being also provided with the non-parallel transverse bores extending at right angles from said side faces of the notches G through said plates and having countersunk ends, the type-bar axles H extending through said bores and provided with the cones *a b* fitting the countersunk ends of the bores, the cones *b* being screwed upon the ends of the axles, and the straight type-bars F secured to the opposite ends of the axles H at right angles thereto and converging toward a common point, substantially as described.

21. In a typewriting machine, the combination of the bearing notches E provided along one edge with the notches or offsets G having non-parallel side faces converging toward a common point, said plates being also provided with the non-parallel transverse bores extending at right angles from said side faces of the notches G through said plates and having countersunk ends, the type-bar axles H extending through said bores and provided with the cones *a b* fitting the countersunk ends of the bores, the cones *b* being screwed upon the ends of the axles and held by lock nuts *c*, and the type-bars F secured to the opposite ends of said axles at right-angles thereto and having straight bodies converging toward a common point, and provided with angular extremities to receive the type-blocks I, substantially as described.

22. In a typewriting machine, the combination of the inclined supporting plate D' located in front of the platen, the bearing plates E secured thereto, the type-bar axles H journaled in said plates, the type-bars F secured to said axles, the key-levers L, and the rods K connecting said levers with the type-bars, substantially as described.

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Witnesses:

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BESSIE SHADBOLT.