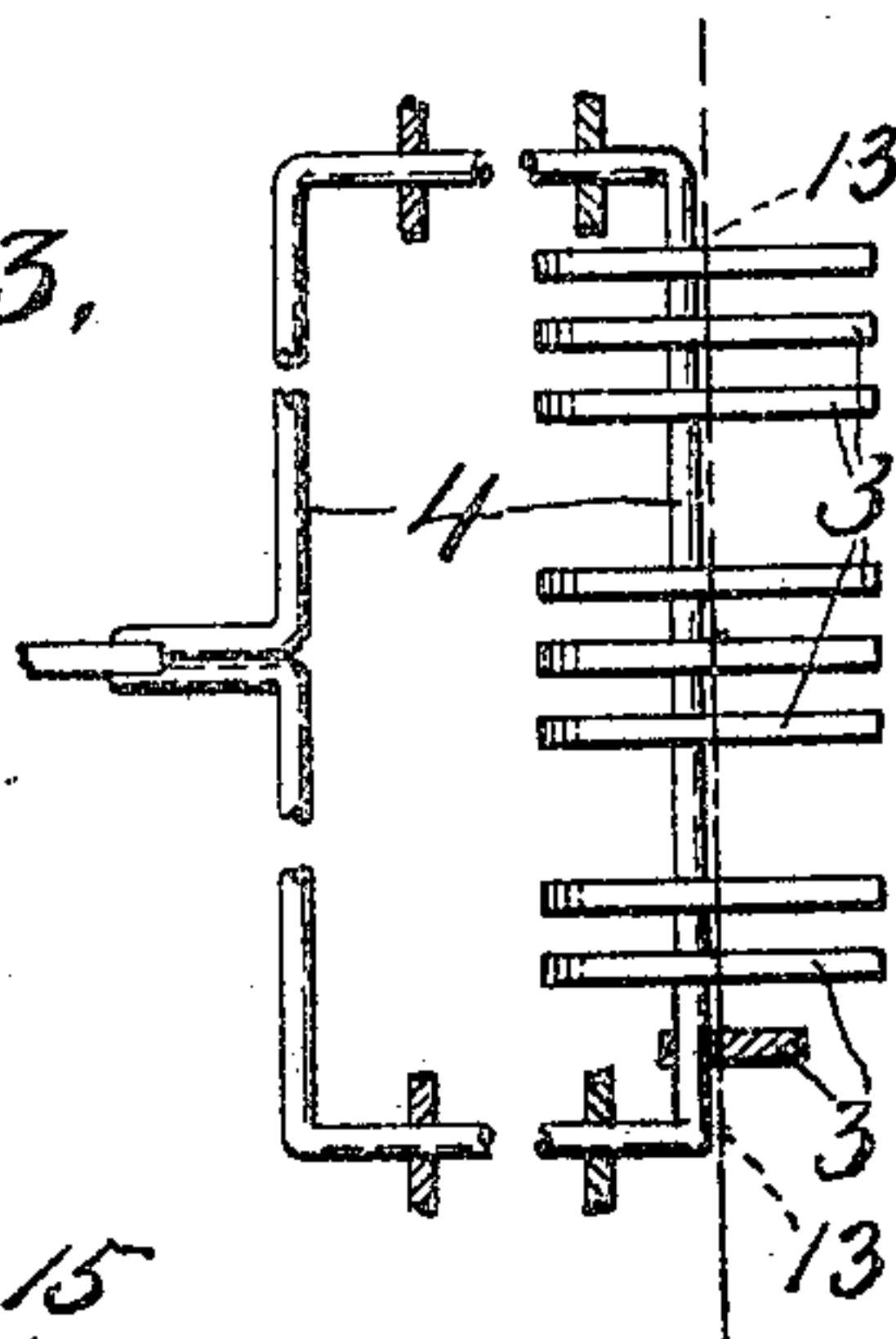
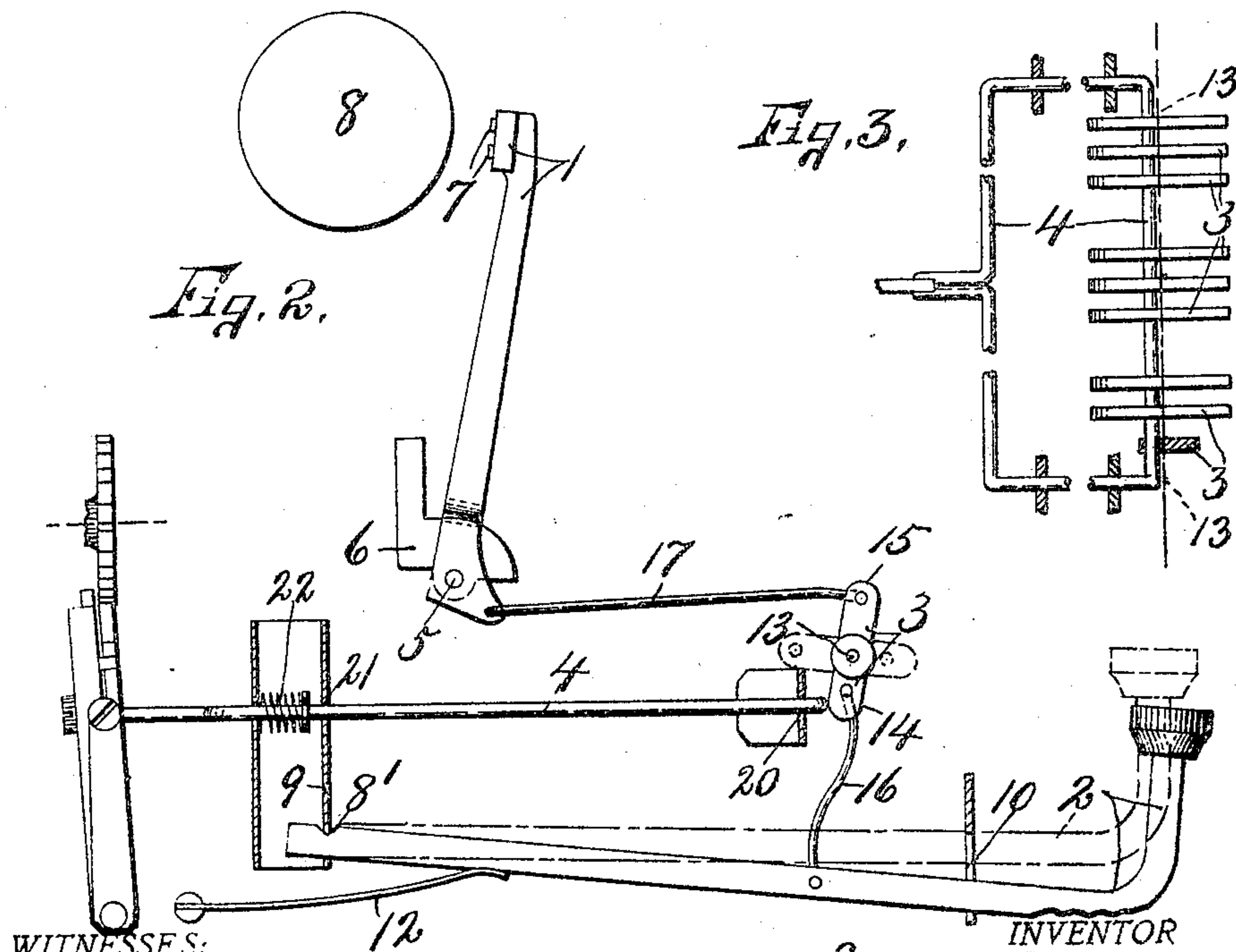
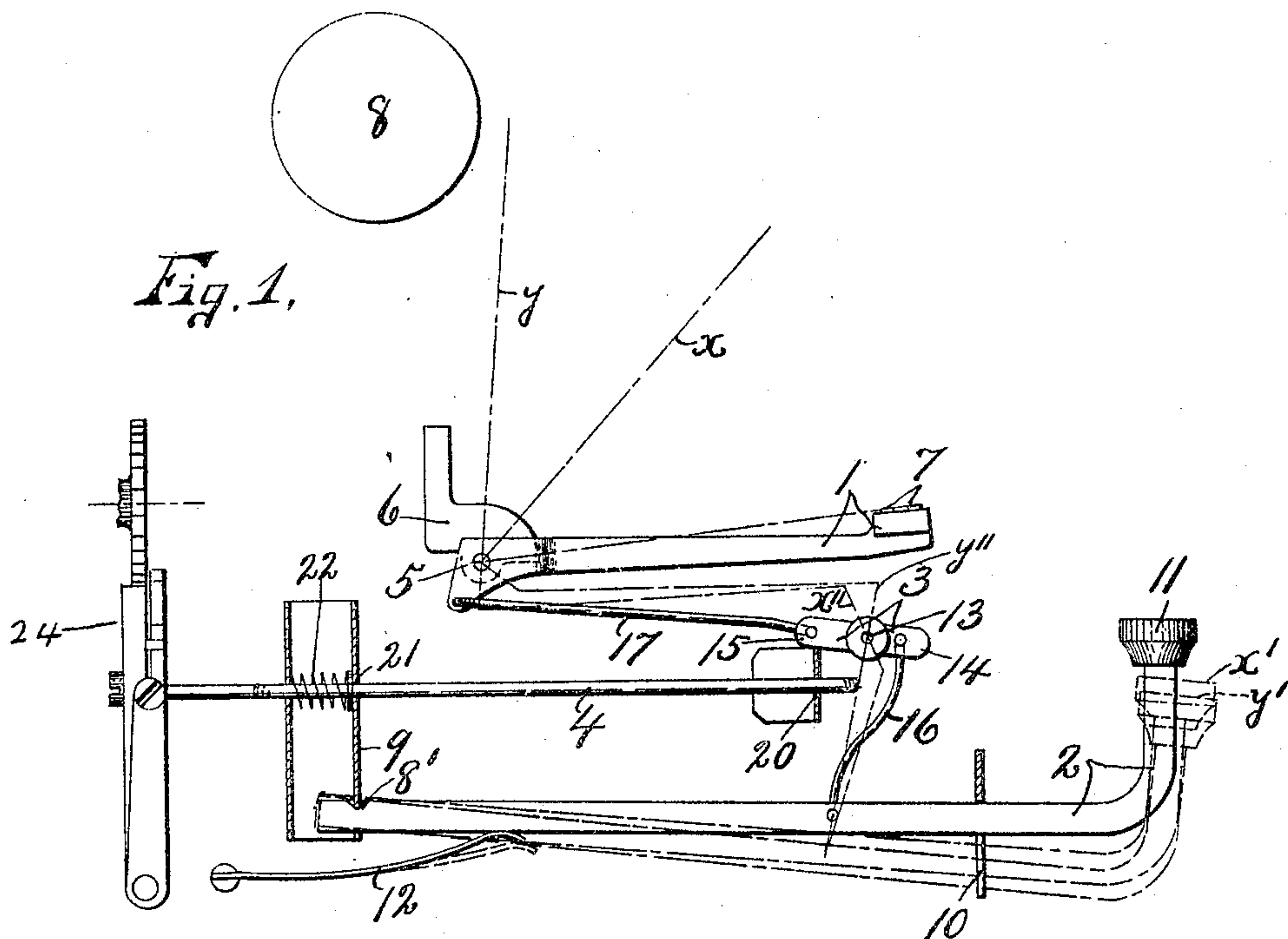


No. 798,558.

PATENTED AUG. 29, 1905.

E. E. BARNEY.
TYPE WRITING MACHINE.
APPLICATION FILED MAR. 26, 1902.



WITNESSES:

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UNITED STATES PATENT OFFICE.

EDWIN E. BARNEY, OF GROTON, NEW YORK, ASSIGNOR OF ONE-HALF
TO FRANK J. TANNER, OF GROTON, NEW YORK.

TYPE-WRITING MACHINE.

No. 798,558.

Specification of Letters Patent.

Patented Aug. 29, 1905.

Application filed March 26, 1902. Serial No. 100,051.

To all whom it may concern:

Be it known that I, EDWIN E. BARNEY, of Groton, in the county of Tompkins, in the State of New York, have invented new and
5 useful Improvements in Type-Writing Machines, of which the following, taken in connection with the accompanying drawings, is a full, clear, and exact description.

This invention relates to improvements in
10 type-writing machines, and refers more particularly to the type-bar and key-lever action of a front-strike type-writing machine.

One of the objects of this invention is to render the action easier at the initial stroke
15 of the key-lever, so that the greater power is required to operate the type-bar at the last end of the stroke of said key-lever, at which period the momentum of the power applied by the operator operates to facilitate the complete operation of the type-bar from its normal to the printing position.

Another object is to permit the type-bars to be normally arranged in a substantially horizontal plane, so as to print in a substantially vertical position when actuated by the
25 key-levers.

A further object is to move the type-bar from its normal to the printing position with an accelerated velocity by the use of a simple
30 lever of the first kind, whereby the type-bar returns from its printing position with the same velocity in order to permit a more speedy action of the operating-keys without liability of the type-bars striking each other in their reverse movements to and from the platen.

A still further object is to prevent the vibratory or independent movement of the type-bars either in their normal or printing positions.

Another object is to interpose a lever of the first kind as a connection between the key-lever and type-bar, whereby the objects previously stated are carried out in the simplest possible manner.

A still further object is to provide yielding means coacting with the lever of the first kind to prevent the vibration of the type-bar when moved to its printing position, whereby the type-bar is automatically forced from
50 the platen independently of the key-lever; and another object is to utilize the movement of said yielding means to actuate other movable parts of the type-writing machine.

To this end the invention consists in the

combination, construction, and arrangement 55 of the parts of a type-writing machine, as hereinafter fully described, and pointed out in the claims.

Referring to the drawings, Figures 1 and 2 are similar elevations of portions of a type-writing machine embodying my invention, the mechanisms being shown in their normal positions in Fig. 1 and their printing positions in Fig. 2. Fig. 3 is a top plan, partly broken away, of a movable retractory member for the type-bars, a series of intermediary levers being shown in conjunction therewith.

Similar reference characters indicate corresponding parts in all the views. 70

As seen in the drawings, this invention consists, essentially, of a type-bar 1, a key-lever 2, and intermediary lever 3, link-connected to the type-bar and key-lever, and a movable retractory member 4, coöperating with the lever 3 to return the type-bars to their normal position. 75

The type-bar 1 may be of any well-known swinging construction, pivoted at 5 to any desired form of support, as a pin 6, and having
80 its free end provided with type 7 and adapted to swing toward and away from a platen 8. Any number of these type-bars may be employed and are arranged to print upon the front face of a platen 8 in the usual manner 85 for visible type-writing machines. These type-bars 1 are normally arranged in a substantially horizontal plane and are adapted to move to a substantially vertical plane in the operation of printing. 90

The levers 2 are suitably mounted upon the frame of the type-writing machine in a substantially horizontal plane and are fulcrumed at their rear ends at 8' to any desired form of support, as 9, which may be a portion of the frame of the machine. The forward ends of the levers 2 are guided in suitable ways 10 and are provided with upturned extremities having keys 11 secured thereto, said key-levers being normally elevated by any desired means, as springs 12. 100

The levers 3 form intermediate connections between the type-bars 1 and the levers 2, there being one of these intermediary levers for each of the key-levers and its corresponding type-bar. Each of these levers 3 is fulcrumed at its intermediate portion at 13 and extends in opposite directions from said fulcrum to 105

form oppositely-arranged arms 14 and 15, which normally extend in a substantially horizontal plane practically parallel with the key-lever 2 and its type-bar 1, the arm 14 being connected by a link 16 to the key-lever 2 and the arm 15 is connected by a link 17 to the type-bar 1.

The link 17 is connected to the type-bar 1 at one side of its axis and normally in a plane beneath said axis, so that the link also normally lies in a substantially horizontal position and extends from its point of connection with the type-bar toward the axis or fulcrum 13 of the lever 3, the point of connection of said link 17 with the lever 3 being in a substantially straight line drawn from the fulcrum 13 to the point of connection of the link 17 with the type-bar 1. It is thus evident that the points of connection of the link 17 with the type-bar 1 and the lever 3 being normally in substantially the same straight line with the fulcrum 13 the type-bar 1 is locked from vibratory or independent movement—that is, the lever 3 and its link connection with the type-bar form a toggle connection, the gravity of the free end of the type-bar serving to draw and to hold the pivotal point between the link 17 and arm 15 in a substantially straight line between the fulcrum 13 and point of connection of the link 17 with the heel of the type-bar—and forms practically a toggle-lock for the type-bar. On the other hand, the arm 14 and link 16 acts as a toggle connection between the levers 2 and 3, which serves not only to transmit motion from the key-lever to the type-bar, but also operates to limit the movement of both the type-bar and key-lever to their operative positions by reason of the fact that the pivotal point in the toggle connection between the link 16 and arm 14 is forced into substantially the same straight line between the fulcrum 13 and the point of connection of the link 16 with the lever 2 when the key-lever is depressed and held to the limit of its movement. In this position it is apparent that the key-lever and type-bar are detained or held from independent vibratory movement, the point of connection between the link 16 and key-lever being so arranged that when the key-lever is depressed to the limit of its movement the lever 3 is moved to a position at substantially right angles to its normal position, and the type of the type-bar are held a slight distance from the platen, thus preventing the possibility of a double action of the type against the platen. By thus connecting and arranging the type-bar 1, key-lever 2, and intermediary lever 3 the type-bar is moved to its printing position with an accelerated velocity, and consequently the initial movement of the operating parts requires the application of but very little power to the key-lever, the type-bar being actuated through the major portion of its movement toward

the platen by correspondingly less movement of the key-lever at the end of its stroke. The theory of this movement is illustrated in Fig. 1, in which I have shown the type-bar 1 as moved to the position indicated by dotted line x , while the key 11 is moved to a corresponding position, (indicated by dotted line x'), these dotted lines representing a portion of the movement of the type-bar and key-lever, the key-lever being depressed the major part of its movement, while the type-bar is represented by line x as actuated through substantially half of its movement. When the type-bar and key-lever move to the dotted positions just described, the lever 3 is moved to the position indicated by a dotted line x'' . The full movement of the type-bar, key-lever, and intermediary lever 3 is represented by dotted lines y y' y'' , and it is apparent from the inspection of these dotted lines that the lever 3 is moved through the major part of its movement from its normal position shown by full lines in Fig. 1 to the position indicated by the dotted line x'' during the major part of the stroke of the key-lever in order to carry the type-bar through substantially half of its movement, the remaining movement of the type-bar being effected by the minor movement of the key-lever 2 and intermediary lever 3, and the greater power is required at the last end of the stroke of the key-lever 2. This greater power, however, is compensated for by the momentum of the force which the operator applies to the key-lever during its period of easier action or first part of the stroke, and the type-bar is moved from the position indicated by dotted lines x to its printing position with an increased velocity, the momentum of which carries it forward to the platen beyond the position indicated by dotted line y with sufficient force to print upon the sheet adjacent to the platen. In the movement just described the pivotal connections of the link 16 with the arm 14 and lever 2 are in substantially the same straight line with the fulcrum of the lever 3, caused by the continued depression of the key-lever, and this serves to retract and to hold the type-bar to the position indicated by dotted line y , the arm 14 and 16 acting to detain the type-bar and key-lever in their operative positions. In order to break this toggle-lock between the key-lever and intermediary lever 3, I provide the yielding member 4, which is preferably common to all of the levers 3 and is actuated successively by the successive operation of the keys and in turn reacts against the intermediary connection as the arm 14 of the lever 3 to instantly return the lever 3 and type-bar 1 when the pressure upon the key-lever is released. This is an important feature of my invention, as it operates to immediately force the type-bar away from the platen and out of the path of the type-bar

next actuated, thus permitting a more speedy action of the key-levers. This yielding member 4, as previously stated, is common to all of the intermediary connections or levers 3, and while it preferably consists of a frame, as seen in Fig. 3, it is evident that I may employ any other equivalent means to give an initial impetus to the return movement of the type-bar, and thereby facilitate the more speedy action of the key-levers.

The frame 4 is guided in suitable bearings 20 and 21, which may be portions of the frame or brackets secured thereto, said bar being held in its normal position by a spring 22, operating to force the forward end of the frame into the path of the arms 14 of the levers 3. I preferably utilize this reciprocal motion of the yielding member 4 for the purpose of operating other mechanisms of the type-writing machine, and to illustrate its utility I have shown an escapement mechanism 24, similar to that seen in my former application, Serial No. 19,889, filed June 11, 1900. It is evident, however, that I may employ this reciprocal motion of the member 4 to operate a ribbon movement or any other part of the type-writing machine which needs to be actuated simultaneously with the operation of the key-levers.

The operation of my invention will now be readily understood upon reference to the foregoing description and the accompanying drawings, and it will be noted that some change may be made in the detail construction and arrangement of the various parts without departing from the spirit thereof. Therefore I do not limit myself to the precise construction and arrangement shown and described.

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

1. In a type-writing machine, the combination with a platen, a type-bar and a key-lever, of connections between the key-lever and type-bar, whereby the movement of the key-lever is limited and the type-bar is held a slight distance from the platen when the lever is depressed to its limit.

2. In a type-writing machine, the combination with a platen, a type-bar and a key-lever, of connections between the key-lever and type-bar including a flexing joint the extension of which limits the depression of the key-lever and holds the type-bar a slight distance from the platen.

3. In a type-writing machine, a type-bar action comprising a type-bar, a key-lever and an intermediary lever all extending normally in substantially the same direction in planes one above the other, a link connecting one end of the intermediary lever with the key-lever, the point of connection with the intermediary lever being movable to a position in a direct line between the fulcrum of the intermediary lever and the point of connection of the link with the key-lever, and a second

link connecting the other end of the intermediary lever with the type-bar.

4. In a type-writing machine, the combination of a key-lever and a type-bar, a second lever connected to the type-bar, and a link connecting the levers, the point of connection of the link with the second lever moving into and out of a direct line between the fulcrum of the second lever and the point of connection of said link with the key-lever as the key-lever is operated.

5. In a type-writing machine, the combination of a key-lever, a type-bar, a second lever, a link connecting one arm of the second lever with the key-lever and having its point of connection with the second lever movable into and out of a direct line between its point of connection with the key-lever and fulcrum of the second lever as the key-lever is operated, a second link connecting the other arm of the second lever with the heel of the type-bar and having its point of connection with the second lever movable into and out of a direct line between its point of connection with the type-bar and fulcrum of the second lever for the purpose set forth.

6. In a type-writing machine, a type-bar action comprising a type-bar, a key-lever, and an intermediary lever having opposite arms toggle-connected respectively to the type-bar and to the key-lever for preventing independent vibratory movement of the type-bar when normal and also for limiting the movement of both type-bar and key-lever when moved to their operative positions.

7. In a type-writing machine, the combination with a type-bar, key-lever and intermediary lever all normally extending in substantially the same direction, of connections between the intermediary lever, type-bar and key-lever, and a sliding abutment engaged with and reacting against the intermediary lever only when the key-lever is depressed for the purpose described.

8. In a type-writing machine, the combination of a type-bar, a key-lever, an intermediary lever of the first kind connected to the key-lever by a flexing joint the extension of which moves the joint to a position in a direct line between the fulcrum of the intermediary lever and the point of connection with the key-lever and limits the movement of the key-lever and prevents vibration of the type-bar.

9. In a type-writing machine, a type-bar action comprising a type-bar and a key-lever, a normally substantially horizontal lever of the first kind connected to the type-bar and key-lever at opposite sides of its axis and adapted to be moved to a substantially vertical position in the operation of printing, and a slidable bar actuated endwise by and reacting against the second lever for the purpose specified.

10. In a type-writing machine, a type-bar action comprising a type-bar lever of the first

kind, a key-lever of the second kind, an intermediary lever of the first kind, all of said levers being arranged in substantially horizontal planes one above the other, a link connecting the key-lever and intermediary lever at the same sides of their fulcrums, a second link connecting the other end of the intermediary lever to the type-bar lever, and a substantially horizontal sliding member adapted

to be actuated by and reacting against the intermediary lever for the purpose set forth.

In witness whereof I have hereunto set my hand this 24th day of March, 1902.

EDWIN E. BARNEY.

Witnesses:

C. H. SWIFT,

B. C. RAWLEY.