No. 787,020. PATENTED APR. 11, 1905.

E. E. BARNEY.

TYPE WRITING MACHINE.

APPLICATION FILED NOV. 24, 1902.

Fig. 1.

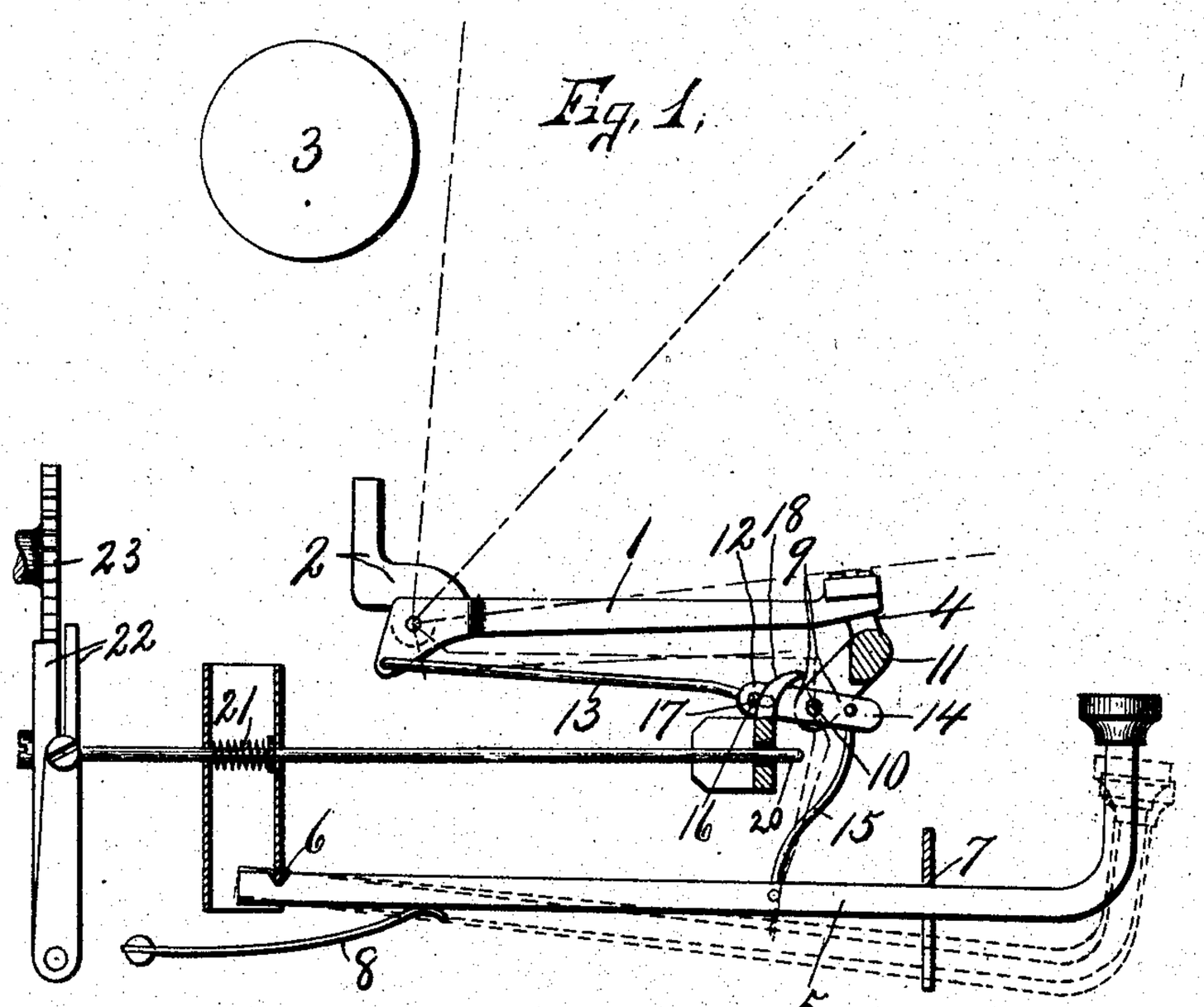


Fig. 3.

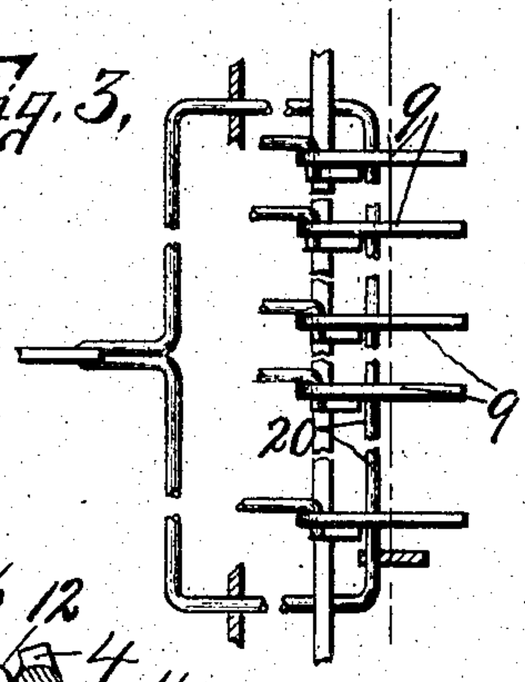
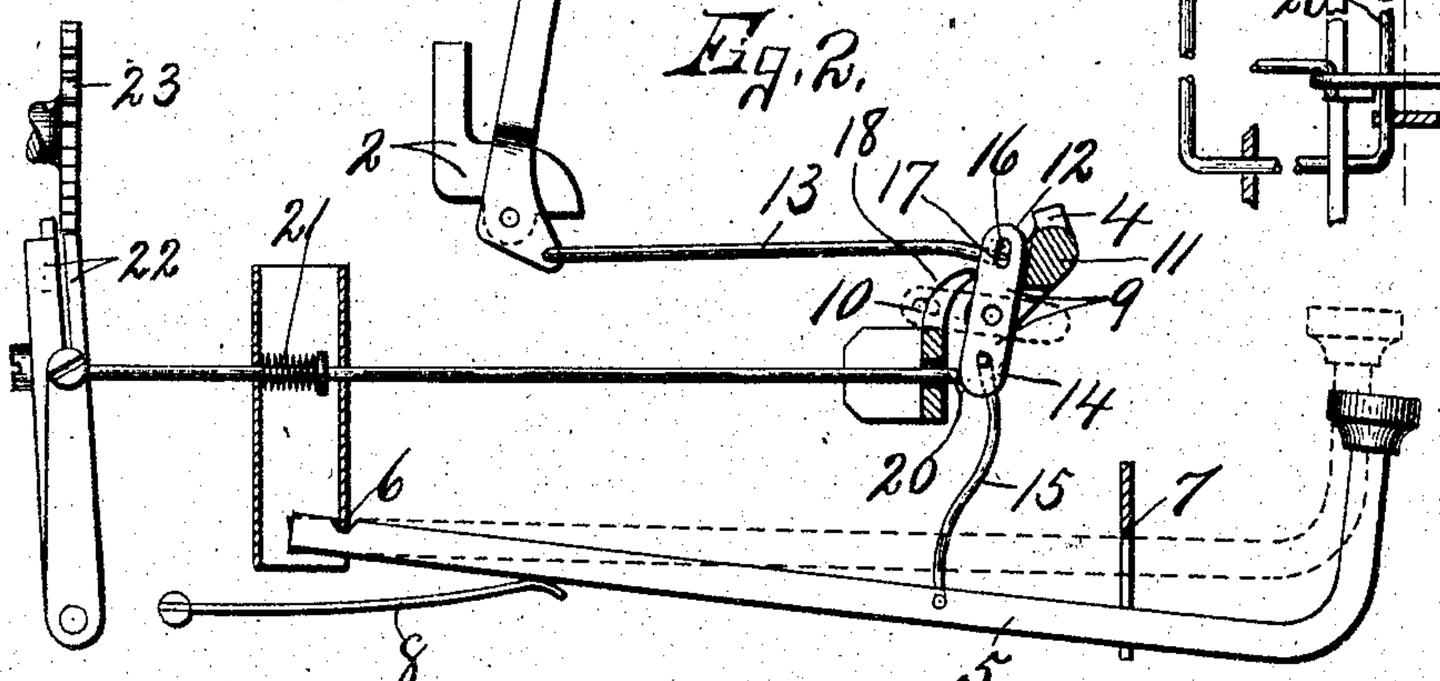


Fig. 2.



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No. 787,020. Patented April 11, 1905.

UNITED STATES PATENT OFFICE.

EDWIN E. BARNEY, OF GROTON, NEW YORK.

TYPE-WRITING MACHINE.

SPECIFICATION forming part of Letters Patent No. 787,020, dated April 11, 1905.

Application filed November 24, 1902. Serial No. 132,591.

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 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 type-writing machines, having more particular reference to the type-bar action, which is similar in many respects to that set forth in my pending application, Serial No. 100,051, filed March 26, 1902.

The invention involves a type-bar, a key-lever, and a second lever having flexing connections with the type-bar and key-lever. One of its objects is to permit the flexing joint between the type-bar and second lever to shift automatically toward the fulcrum of the second lever when the type-bar is moved to the printing-point, so that the second lever operates with an increased power to return the type-bar to its normal position.

Another object is to prevent the sliding movement of said flexing joint when the type-bar is at rest, this locking of the flexing joint being accomplished by means separate from the second lever and serves to prevent rebound of the type-bar from its normal position.

A further object is to prevent the vibration of the type-bar at the printing position to avoid "double" or blurred print; and a still further object is to provide means for automatically flexing this latter flexing connection when the pressure upon the key-lever is released, whereby the type-bar is more quickly returned from the printing-point to its normal position.

In 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 position in Fig. 1 and in their operative position in Fig. 2. Fig. 3 is a top plan, partly broken away, of a universal bar for the flexing connection between the key and intermediary lever, a series of intermediary levers being shown in connection with the universal bar.

Similar reference characters indicate corresponding parts in all the views.

The type-bar 1 is pivotally mounted upon a suitable hanger, as a fin 2, in a plane beneath the platen 3, the type-bar being normally disposed in a substantially horizontal position and its type being adapted to engage the front face of the platen 3, the front end of the type-bar normally resting upon a seat 4.

The key-lever 5 is mounted horizontally beneath the type-bar with its rear end fulcrumed at 6 and its forward end normally held against an abutment 7 by a spring 8.

Interposed between the type-bar 1 and key-lever 5 is a second lever 9, which is centrally fulcrumed at 10 to a suitable support 11, this second lever being normally disposed in a substantially horizontal position, its rear arm 12 being connected by a link 13 to the heel of the type-bar, and its front arm 14 is connected by a link 15 to the intermediate portion of the key-lever 5, the link 13 and its connection with the arm 12 forming a flexing connection between the lever 9 and type-bar 1, and the arm 14 and link 15 form a flexing connection between said second lever and the key-lever.

The flexing joint between the lever 9 and type-bar is arranged to shift toward the fulcrum 10 when the key-lever is depressed, and I therefore provide the arm 12 with an elongated slot or opening 16, which receives a laterally-projecting shoulder 17 upon the front end of the link 13, whereby as the key-lever is depressed to the limit of its downward movement, as seen in Fig. 2, the front end of the link 13 drops automatically by gravity or equivalent means to the lower end of the slot, and the flexing joint is therefore nearer the fulcrum 10, which reduces the leverage and permits an easier return movement of the type-bar with less power than would be the case if the flexing joint always maintained the same position with reference to the fulcrum.

As the type-bar returns to its normal position its own gravity tends to extend the flexing connection, and thereby draws the shoulder 17 to the rear end of the slot 16; but I preferably employ a cam 18 to engage the

shoulder 17 and insure its return to the extreme end of the slot 16. This cam also serves to normally hold the shoulder 17 against the rear wall of the slot, and therefore locks the link 13 from endwise movement to prevent rebound of the type-bar at its normal position of rest, it being understood that one of these cams is employed for each flexing connection between the lever 9 and heel of the type-bar and that the shoulder 17 protrudes through the slot a sufficient distance to engage its cam.

In order to prevent the double action of the type at the printing-point, I preferably adjust the flexing connection between the lever 9 and key-lever, so that when the key-lever is depressed to the limit of its movement the point of connection with the arm 14 is moved to a position in a direct line between the fulcrum of the lever 9 and the point of connection of the link 15 with the key-lever, in which position the type-bar is held a slight distance away from the printing-point.

The lever 9 being normally in a substantially horizontal position nearly parallel with the normal positions of the type-bar and key-lever, it is evident that when the key-lever is depressed to its limit the lever 9 is rocked to a position at substantially right angles to its normal position and that the type-bar is moved with an accelerated motion from normal to printing positions, the momentum imparted to the type-bar by the quick depression of the key-lever carrying the type forward to the printing-point, and therefore moves the point of connection of the link 15 with the arm 14 beyond the direct line between the fulcrum 10 and point of connection of said link 15 with the key-lever.

It is desirable to return the type-bar from the printing-point as rapidly as possible to prevent one type-bar from interfering with another in the rapid action of the keys, and I therefore provide a yielding abutment 20, which is adapted to be engaged by the rear faces of the arms 14 when the key-lever is depressed, this abutment consisting of a universal bar extending transversely of the levers and is adapted to be actuated endwise by each lever 9 independently of the others, a suitable spring 21 operating to return the abutment and to accelerate the return movement of the type-bar from its printing position. This reciprocal movement of the universal bar or abutment as it is actuated by the several keys and the spring 21 may be utilized to operate other mechanisms in the machine—as, for instance, the escape mechanism—and I have therefore shown said bar as connecting to oscillating pawls 22, which coact with an escapement-wheel 23 to effect the step-by-step movement of the carriage at each movement of the key-levers.

The flexing joint between the lever 9 and heel of the type-bar, or rather the pivotal connection 17, is normally disposed in a direct line between the fulcrum 10 and the point of connection of the link 13 with the type-bar, and said shoulder 17 coacts with the cam 18 to prevent rebound or vibration of the type-bar when returned to its normal position. It is evident, however, that this shoulder 17 may be at one side of the direct line, as described, and the cam adjusted to hold it normally in its extreme outer position to effect the same result.

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 type-bar and a key-lever, of a second lever connected to the key-lever and having a flexing connection with the type-bar, the point of connection of the type-bar with the second lever shifting its position with reference to the fulcrum of said second lever as the type-bar is moved toward and from its printing position to change the leverage, and means to shift the connection from the fulcrum as the type-bar returns to its normal position.

2. In a type-writing machine, the combination with a type-bar and a key-lever, of a second lever connected to the key-lever and having a flexing connection with the type-bar, the point of connection of the type-bar with the second lever moving automatically by gravity toward the fulcrum of the second lever when printing to decrease the leverage on the return of the type-bar.

3. In a type-writing machine, the combination with a type-bar and a key-lever, of a second lever connected to the key-lever and having a flexing connection with the type-bar, the point of connection of the type-bar with the second lever shifting its position with reference to the fulcrum of said second lever as the type-bar is moved toward and from its printing position to change the leverage and a cam to return said point of connection on the return of the type-bar.

4. In a type-writing machine, the combination with a type-bar and a key-lever, of a second lever connected to the key-lever and having a flexing connection with the type-bar, the point of connection of the type-bar with the second lever moving automatically toward the fulcrum of the second lever in the act of printing to decrease the leverage on the return of the type-bar and means to automatically shift said point of connection from the fulcrum as the type-bar returns to its normal position.

5. In a type-writing machine, the combination with a type-bar and a key-lever, of a second lever having flexing connections with the type-bar and key-lever, the point of connection of the type-bar with the second lever shifting by gravity toward the fulcrum of the second lever as the type-bar is thrown to the printing-point.

6. In a type-writing machine, the combination with a type-bar and a key-lever, of a second lever having flexing connections with the type-bar and key-lever, the point of connection of the type-bar with the second lever shifting toward the fulcrum of the second lever as the type-bar is thrown to the printing-point, and means for returning said point of connection to its extreme outer position when the type-bar returns to its normal position.

7. In a type-writing machine, the combination with a type-bar and a key-lever, a second lever connected to the key-lever, a link connected to the type-bar and having sliding and pivotal connection with the second lever, and means operating to lock the sliding connection from movement when the type-bar is in its normal position.

8. In a type-writing machine, the combination with a type-bar and a key-lever, a second lever connected to the key-lever, a link connected to the type-bar and having sliding and pivotal connection with the second lever, and means operating to automatically lock the sliding connection in its extreme outer position as the type-bar returns to its normal position.

9. In a type-writing machine, the combination with a type-bar and key-lever, of a second lever having flexing connections with the type-bar and with the key-lever, the connection with the type-bar having an independent sliding movement, and means separate from the second lever for locking the sliding connection to prevent rebound of the type-bar from its resting position.

10. A type-bar action for type-writing machines comprising a type-bar, a key-lever, a second lever, a link connected to the type-bar and having sliding connection with the second lever, means to lock the link from sliding movement upon the second lever when the type-bar is in normal position, and a connection between the key-lever and second lever.

11. A type-bar action for type-writing machines comprising a type-bar, a key-lever, a second lever connected to the key-lever and having a flexing connection with the type-bar, and means separate from the second lever to lock the flexing connection to prevent rebound of the type-bar when returned to normal position, the point of connection of the key-lever with the second lever moving to a position in a direct line between the fulcrum of the second lever and its point of connection with the key-lever.

12. A type-bar action for type-writing machines comprising a type-bar, a key-lever, a second lever connected to the type-bar, a flexing connection between the key-lever and second lever, the flexing joint being normally in a direct line drawn through the fulcrum of the second lever substantially parallel to the key-lever and movable to a position in a direct line between the said fulcrum and the point of connection with the key-lever.

13. A type-bar action for type-writing machines comprising a type-bar, a key-lever, a second lever connected to the type-bar and having a flexing connection with the key-lever, the flexing joint moving to a position in a direct line between the fulcrum of the second lever and its point of connection with the key-lever as the key-lever is depressed and before the type reaches the printing-point.

14. 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.

15. 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.

16. 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.

17. 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.

18. 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 le-

ver only when the key-lever is depressed for the purpose described.

19. In a type-writing machine, a type-bar action comprising a type-bar and 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 movable member adapted to be actuated by and reacting against the second lever for the purpose specified.

20. 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 15th day of November, 1902.

EDWIN E. BARNEY.

Witnesses:
CHAS. O. RHODES,
W. B. GALE.