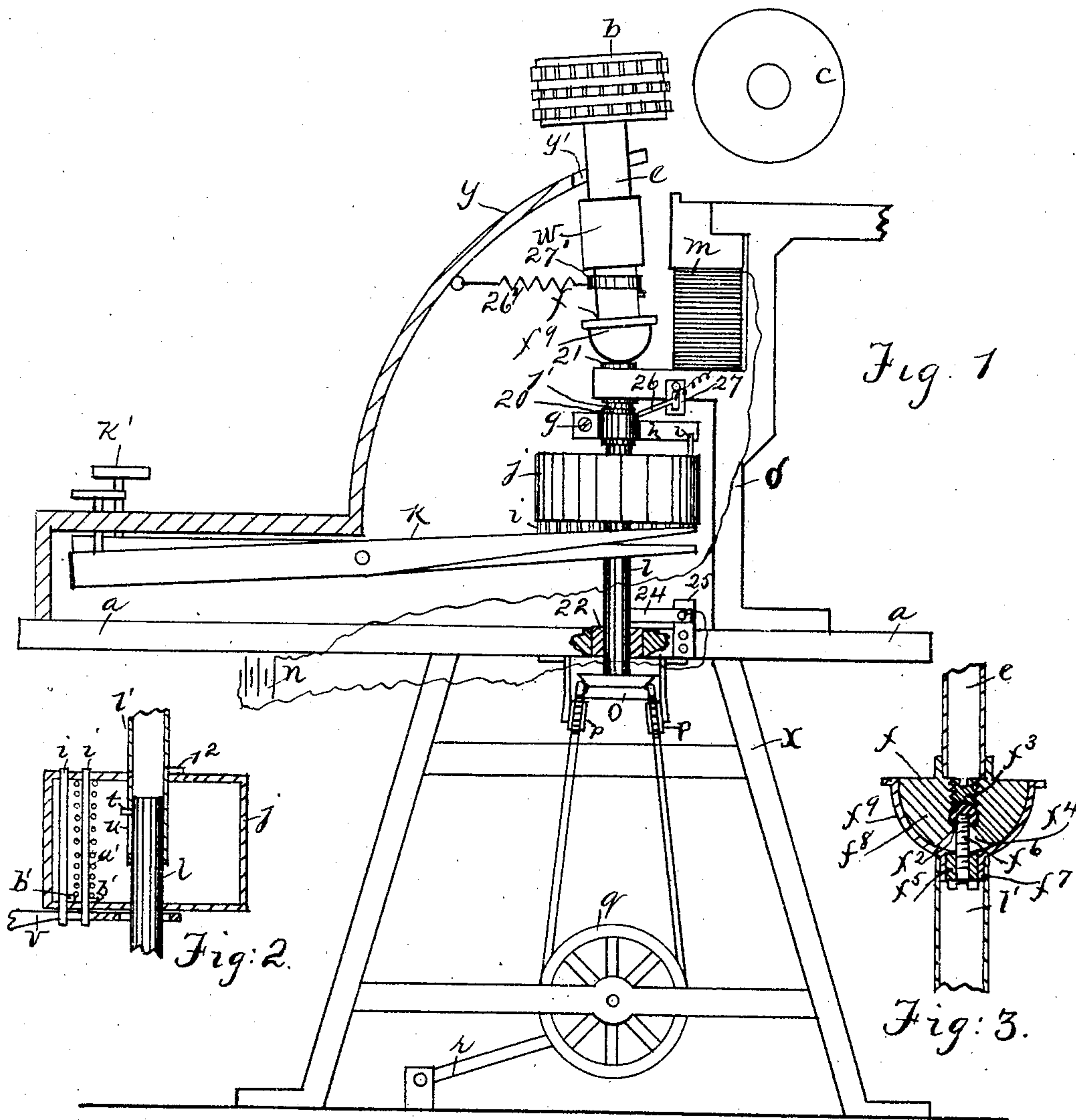


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H. BATES.
TYPE WRITER.

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UNITED STATES PATENT OFFICE.

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TYPE-WRITER.

SPECIFICATION forming part of Letters Patent No. 779,518, dated January 10, 1905.

Application filed January 2, 1904. Serial No. 187,541.

To all whom it may concern:

Be it known that I, HARRY BATES, a citizen of the United States, residing at Rensselaer, New York, have invented certain new and useful Improvements in Type-Writers; and I do hereby declare the following to be a full, clear, and exact description of the invention, such as will enable others skilled in the art to which it appertains to make and use the same, reference being had to the accompanying drawings, and to the letters and figures of reference marked thereon, which form a part of this specification.

My invention relates to that style of type-writers known as "wheel-machines," and has for its object the improvement of that portion of the mechanism which operates the type-wheel.

In the drawings, Figure 1 shows a side elevation of that portion of the mechanism; Fig. 2, a sectional view of the stop or pin casing, and Fig. 3 a vertical sectional view of the form of universal joint used whereby the type-wheel is enabled to make contact with the paper-roll.

a shows the top of a table for holding the type-writer, and *x* the legs thereof.

b shows the type-wheel attached to the standard *e*, and *c* the paper-roll.

d shows the frame of the machine.

l is a revoluble shaft passing through the table-top and insulated therefrom, as seen at 22, and has a grooved wheel attached to its lower end adapted to be revolved by a belt passing over the pulleys *p p* and around the driving-wheel *q*, which is operated by the treadle *r*. The shaft *l* is compound and consists of the solid shaft *l* entering the tubular portion *l'*, that part of the shaft having a slot *u*, and *l* having a projection *t* resting in said slot and arranged so the tubular portion can slide up and down on the portion *l* to an extent equal to the length of said slot, and so that when the portion *l* revolves it will revolve the portion *l'* with it. *l'* has a projection *l''* resting against the top of the casing *j*, so that when the casing is raised by the lifting-lever *v* the casing will carry the tubular portion *l'* up with it in order that the type-wheel *b* may be raised and lowered, so as to print any of

the letters or figures it carries. In the upper end of *l'* is set the tubular projection *f'*, being a portion of the shell of the universal joint *f*, and is made fast therein. In this tubular portion is set a block having a threaded hole through it in which the screw *f⁶* is turned, the upper end of the screw carrying the ball *f²*, this ball resting centrally in an opening in the hemispherical member *f⁸*, said member having an opening closed by the screw-plug *f³*.

The joint *f* is assembled as follows: The screw-plug *f³* being removed, the ball *f²* is dropped into place through the threaded hole made for the screw-plug. The screw *f⁶* is now inserted through the block *f⁵* and screwed home until its end enters the threaded opening in the ball *f²*, when by tightening or loosening the screw as much or as little play is given to the ball as may be desired. The screw-plug *f³* is now screwed home, as seen, the bottom end producing the rounded top to the chamber occupied by the ball. The ball is now inclosed in a chamber forming a common center to the hemispherical member *f⁸*, and there being a countersink or cone-like opening *f⁴*, the hemispherical member will tip in the shell or cup member at any degree desired; but the screw *f⁴* draws the member *f⁸* against the inner walls of the cup *f⁹*, so as to produce enough friction to cause the member *f⁸* to revolve with the cup and the portion of the shaft when that shaft is revolved, yet allowing of the tipping motion to the member *f⁸* and tubular standard *e* and the type-wheel *b*.

Upon the standard *e* is a circular piece of soft iron *w*, and carried by the frame *d* is an electromagnet *m*, which attracts the soft-iron member *w* and causes the type-wheel to strike the paper roll when a key is depressed, as will be fully described hereinafter.

Carried by the shaft *l'* is the flipper *h*, having the screw *g* by which it is tightened about the shaft and made to revolve with it. As seen in Fig. 2, the compound shaft, consisting of shafts *l'* and *l*, pass into and through the casing *j*, the casing not revolving with the shaft, its only movement being the rising and falling one hereinbefore mentioned. The com

pound shafts l and l' are constantly in electrical connection and pass through the top and bottom plates of casing j with a working fit and are also constantly in electrical connection
 5 with the casing j , and the casing with the pins i , all these parts being metallic. Casing j carries the pins or stops i , each pin having a coiled spring in connection with it, compelling the pin to assume its normal position after
 10 it has been raised by the levers k and then released by them. The casing j is held in position by being attached to a bracket on the rear side of the casing and the bracket attached to the frame. (Bracket not seen.) The
 15 battery n is connected up by wiring to the electromagnet and thence to the flipper h , the current passing down the pin i and the casing into shaft l , then to the brush 24, which is held on the insulating material 25, thence on
 20 the wire to the battery, thus making a complete circuit.

At 20 will be seen insulating material insulating the flipper from the shaft, and at 21 insulation insulating the shaft from the frame,
 25 and at 22 insulating material insulating the shaft from the table. To get from the electromagnet to the flipper and the pins, the current passes to brush 26, held on the insulation 27, the end of the brush 26 rubbing on the
 30 edge of the metallic hub or flipper h , the current passing at any time, the flipper and a pin i continuously bearing upon it, the lips held by the screw g passing under the brush without interfering with it, the end of the brush
 35 not being interfered with by the said lips being in contact.

The operation is as follows: The operator, using the treadle, (any other source of power, such as an electric motor, may be used if desired,) causes the shafts l and l' , with the joint
 40 f and standard e and type-wheel b , to revolve rapidly, the treadle being uniformly and constantly operated, producing a uniform rotation of the parts. A key k' is pressed down, not necessarily struck, for simple down pressure will operate the machine, when the lever
 45 k will strike the proper pin protruding through the bottom of the casing j , and this pin or stop will project upward and out of the top of the casing, as seen in Fig. 1. The rapidly-revolving flipper h , being insulated, as seen at 20, will strike this pin, when electrical connection will be made from the battery to the magnet, through the insulated
 50 brush 26, through the flipper h , through the pin and casing and shaft l , through brush 24 and to the battery, and the dead coil will instantly become a live electromagnet, which will draw the soft-iron core w against the
 55 face of the magnet, which being hollowed out on its face to receive the round surface of the core w it will receive the same and compel the core w to always come to the same and exact stopping-point, and all revolution of
 60 the shafts, standard e , and type-wheel b will

cease and the paper receive the impression of the proper type with a sharp blow, the hemispherical member f^8 tipping or rolling in the cup f^9 to allow of this striking blow being
 70 given. The spring 26' is attached to the cover and insulated therefrom and is connected to a loose ring 27' on the shaft e , and as the magnet is deenergized the spring 26' draws the type-wheel to its normal position, the shaft
 75 rotating in the ring easily. As soon as the lever k is released the spring a' forces the pin i to its normal position and the current is cut off the electromagnet. When it is desired to raise the type-wheel b , so as to print capitals or figures, a key connected with lever v
 80 is pressed down, when that lever, the outer end of which has an opening through which the shaft l passes, as seen in Fig. 2, raises the case j , which, striking against the projection l^2 , also forces the tubular shaft l' upward by
 85 sliding it on the shaft l to the proper height, its upward motion being controlled by the pin or projection t and the slot u , as seen in Fig. 2.

It will be noticed that the standard e when
 90 it makes its stroke toward the paper-roll travels in a slot in the cover y of the machine at y' . This slot is just wide enough to allow of this motion and of the standard e revolving in it, and the standard is therefore prevented
 95 from tipping sidewise thereby. The blade of the flipper h is made with some resilience, so that when the pin i is struck the blade will bend rearward somewhat and allow the electromagnet being energized before a full stop
 100 is made by the shaft l' , so as not to produce an absolutely sudden stoppage of rotation, the contact of the member w with the pole of the magnet finishing or assisting in finishing the rotation of the standard e at precisely the
 105 right point.

Having now described my invention, so that those skilled in the art may know how to make and use the same, what I claim, and desire to obtain by Letters Patent, is—

1. In a type-writer a type-wheel as b mounted on and revolved by a revoluble shaft as e , said shaft carrying a member as w arranged to enter and recede from a depression in an electromagnet as m ; an electromagnet as m having a depression therein arranged to receive and act as a guide to the member w ; a rotating and tipping joint whereby the said shaft is in operative connection with a second revoluble shaft as l' , said shaft l' being in operative connection with a revoluble shaft as l and arranged to have a vertical movement thereon; a non-revoluble casing as j carrying operative stops as i and having a vertical movement on the shaft carrying it; a flipper carried on one of the shafts and insulated therefrom and arranged to revolve with it and to strike and rest against a stop as i when the same is projected in its path; means for rotating the shafts and for projecting and with-
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drawing said stops, and means for energizing said magnet when the stops are in contact with the flipper, all arranged and operating to cause the type-wheel to revolve and to bring its type as required into alinement with the object to be printed on and to strike a blow thereon substantially as described.

2. In a type-writer a series of revoluble shafts and means for revolving them, in operative connection, one shaft having a tipping motion and carrying a type-wheel revolving with it and carrying a member having its surface arranged to enter the indented surface of an electromagnet; an electromagnet having an indented portion arranged to receive and guide the member carried by said shaft; a joint operatively connecting said shaft to a second shaft as *l'* by which the first-named shaft may be revolved and may tip at any angle, said second shaft carrying a revoluble flipper insulated from it, and having some resilience, said shaft also carrying a non-revoluble casing having a lengthwise movement on said shaft and containing movable stops arranged to be projected and withdrawn from contact with said flipper and means for projecting and withdrawing said stops, and a source of electric energy and conductors therefor arranged so that when the stops are in contact with the flipper the magnet will be energized and draw the type-wheel against the object being printed on and when not in such contact said magnet will be inoperative substantially as described.

3. In a type-writer key-levers in operative connection with stops movable by means of said levers, each lever operating its appropriate stop; a non-revoluble casing carried on a revoluble shaft said casing carrying pins or stops in operative connection with the key-levers, said pins or stops having resilient devices arranged to return them to their normal positions when disengaged from the key-levers; a flipper carried by a revoluble shaft and in proximity to the said stops and arranged to strike against and be stopped by them when operated by the key-levers, said flipper being insulated from said shaft and electrically connected with an electromagnet said magnet being arranged to be energized when the flipper and a pin or stop is in connection, and to be deenergized when the flipper and the stop is disconnected, the flipper being electrically in connection with the magnet; an electromagnet in connection with a

source of electrical energy and in proximity to the revoluble shaft carrying the revoluble type-wheel the shaft arranged to tip and be forcibly drawn to the magnet when the magnet is energized and to recede therefrom when it is deenergized, said revoluble shaft carrying the type-wheel and moving in a slot as *y'* and arranged to be steadied by said slot, said electromagnet having an opening arranged to receive and act as a guide to the shaft when said shaft is drawn in contact with the electromagnet; a revoluble joint carried by a second shaft and connecting two shafts and arranged to allow of a tipping motion to the shaft carrying the type-wheel; means for revolving the shafts and all operating to cause the type-wheel to revolve and come to a full stop when desired and present the desired type to the paper and strike an impression-blow thereon and print its character as desired substantially as described and shown.

4. In a type-writer a type-wheel carried on an operating device consisting of a plurality of shafts having a revoluble motion, one of said shafts having also a tipping motion, said shafts being operatively in connection by a joint consisting of a cup-shaped or basin-like member having an opening in its bottom and attached to one end of one of the shafts, said cup-shaped member carrying a hemispherical member, said member having an opening in its bottom ending in a spherical central opening at its center and having an opening from its upper or flat surface leading to the spherical opening and stopped by a removable plug, the cup-shaped member and the hemispherical member being movably united by a holding device having a ball resting movably in the spherical opening in the hemispherical member and adjustably fixed to the holding device the opposite end of the holding device being removably but tightly held in position, the second shaft being in connection with the hemispherical member and arranged so that on removal it will uncover the plug in said member and allow of its being removed or inserted, all operating so that all the shafts may be revolved as one and one of them tipped while revolving substantially as described.

In testimony whereof I affix my signature in the presence of two witnesses.

HARRY BATES.

Witnesses:

W. M. BROWN,
J. C. MACCULLOCH.