(No Model.)

4 Sheets—Sheet 1.

H. ABBOTT.

TYPE WRITING MACHINE.

No. 437,372. Patented Sept. 30, 1890.

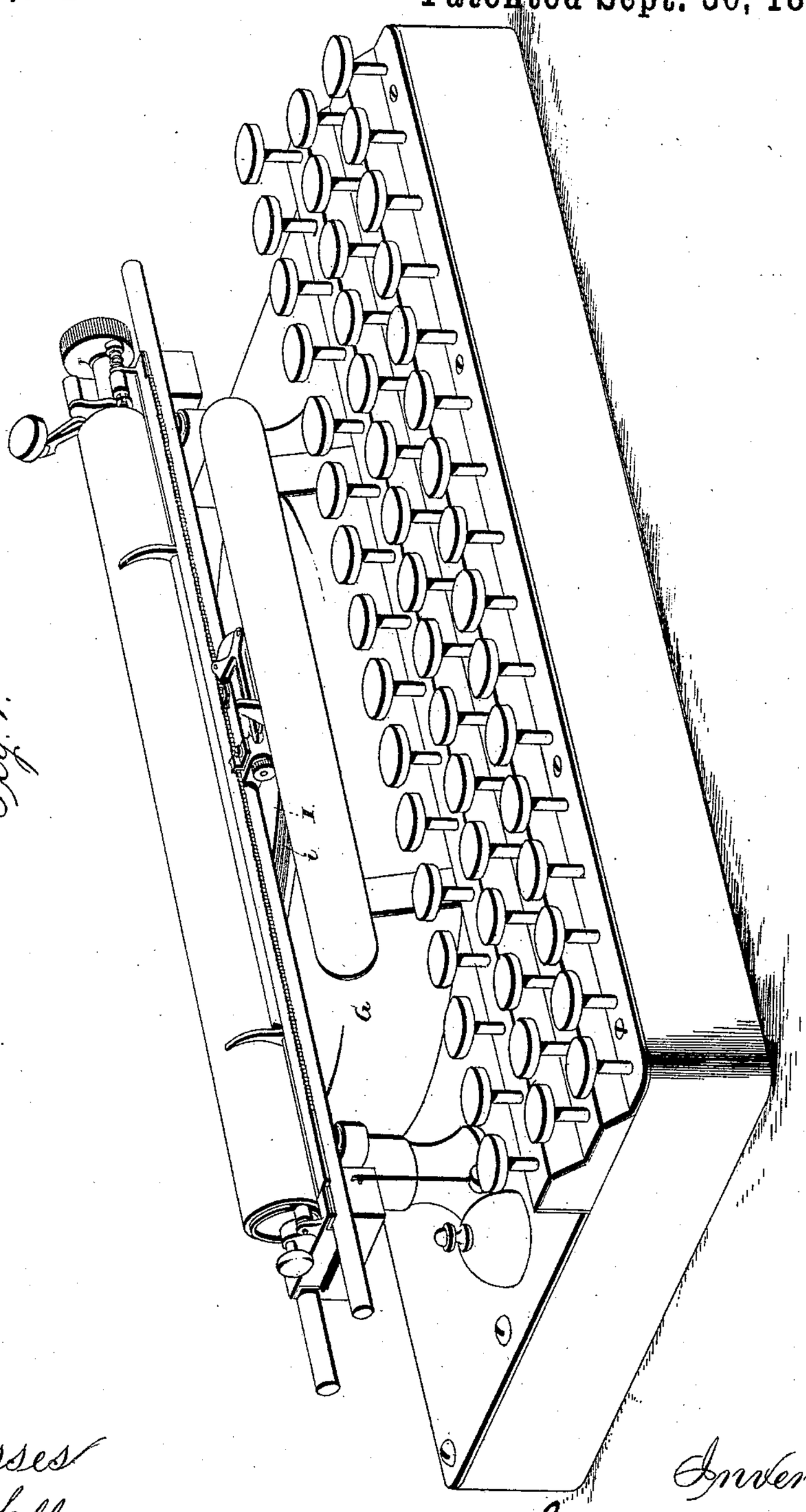


Fig. 1.

Witnesses
Chas. J. Williamson.
Henry C. Hazard.

Inventor
Henry Abbott, by
Brindley and Russell, his Attys.

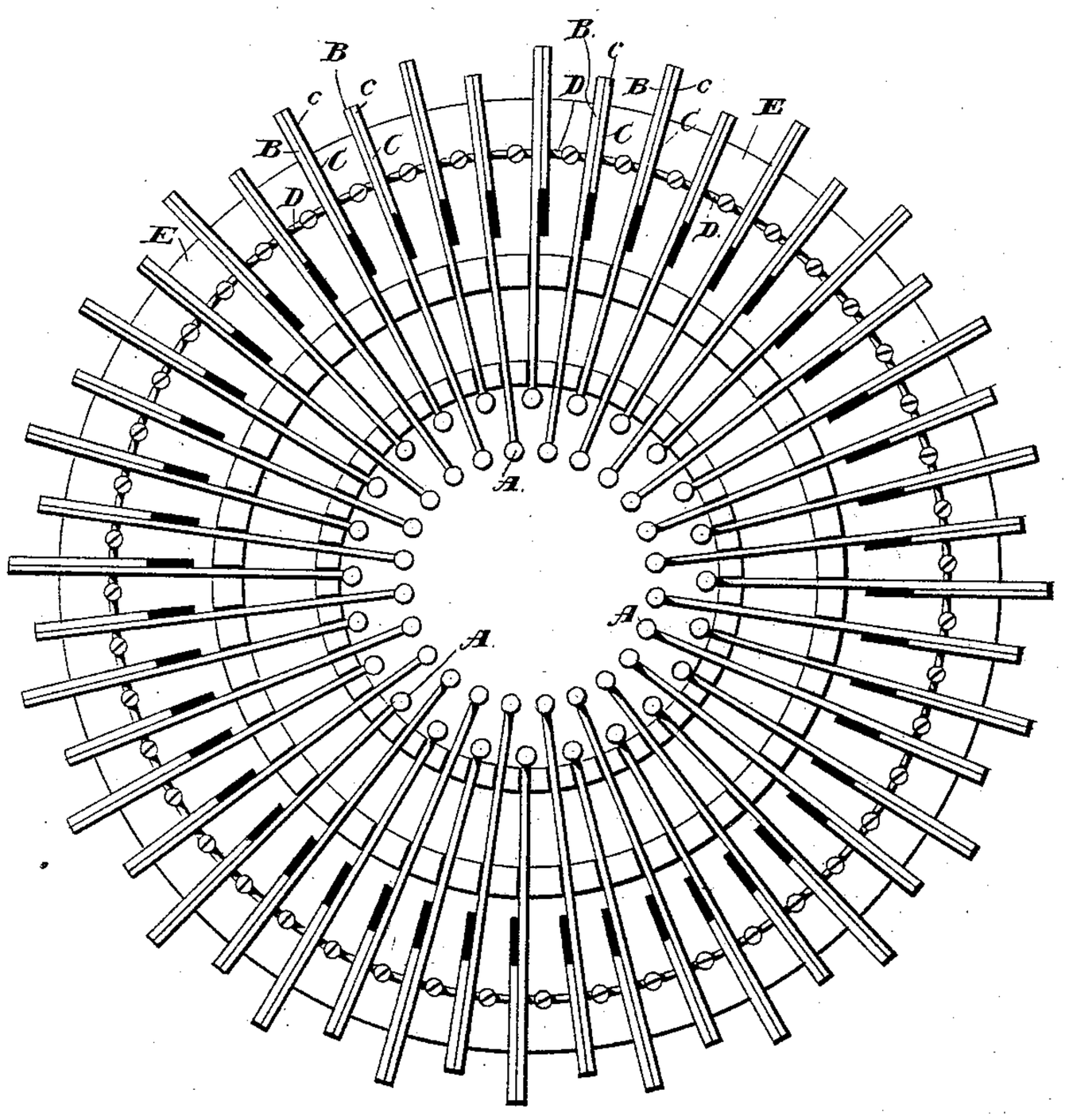
(No Model.) 4 Sheets—Sheet 2.

H. ABBOTT.

TYPE WRITING MACHINE.

No. 437,372. Patented Sept. 30, 1890.

Fig. 2.



Witnesses
Chas. J. Williamson.
Henry C. Hazard.

Inventor
Henry Abbott, by
Brindle and Russell, his Attys.

(No Model.) 4 Sheets—Sheet 3.

H. ABBOTT.

TYPE WRITING MACHINE.

No. 437,372. Patented Sept. 30, 1890.

Fig. 3.

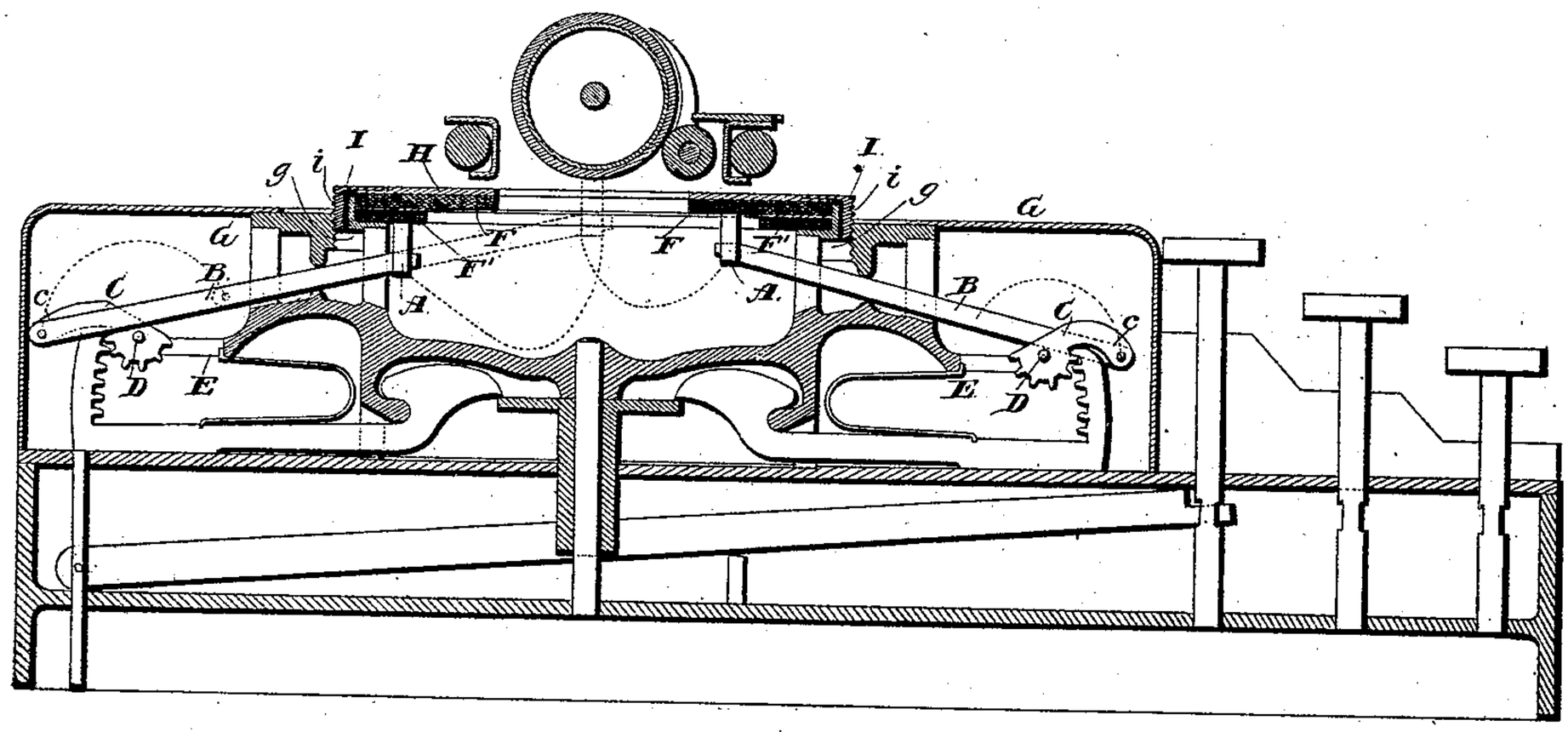
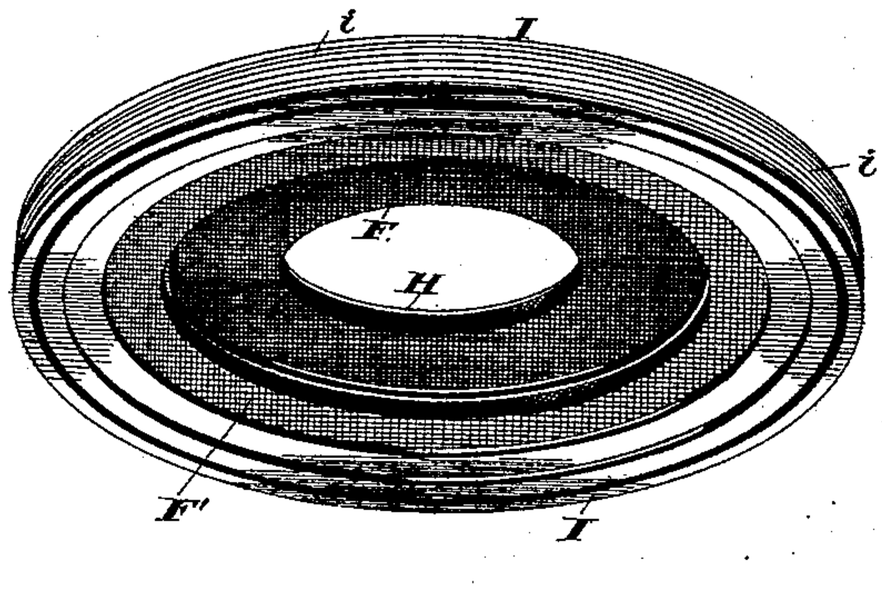


Fig. 4.



Witnesses
Chas. J. Williamson.
Henry C. Hazard

Inventor
Henry Abbott, by
Brindle & Russell, his Attys.

(No Model.)

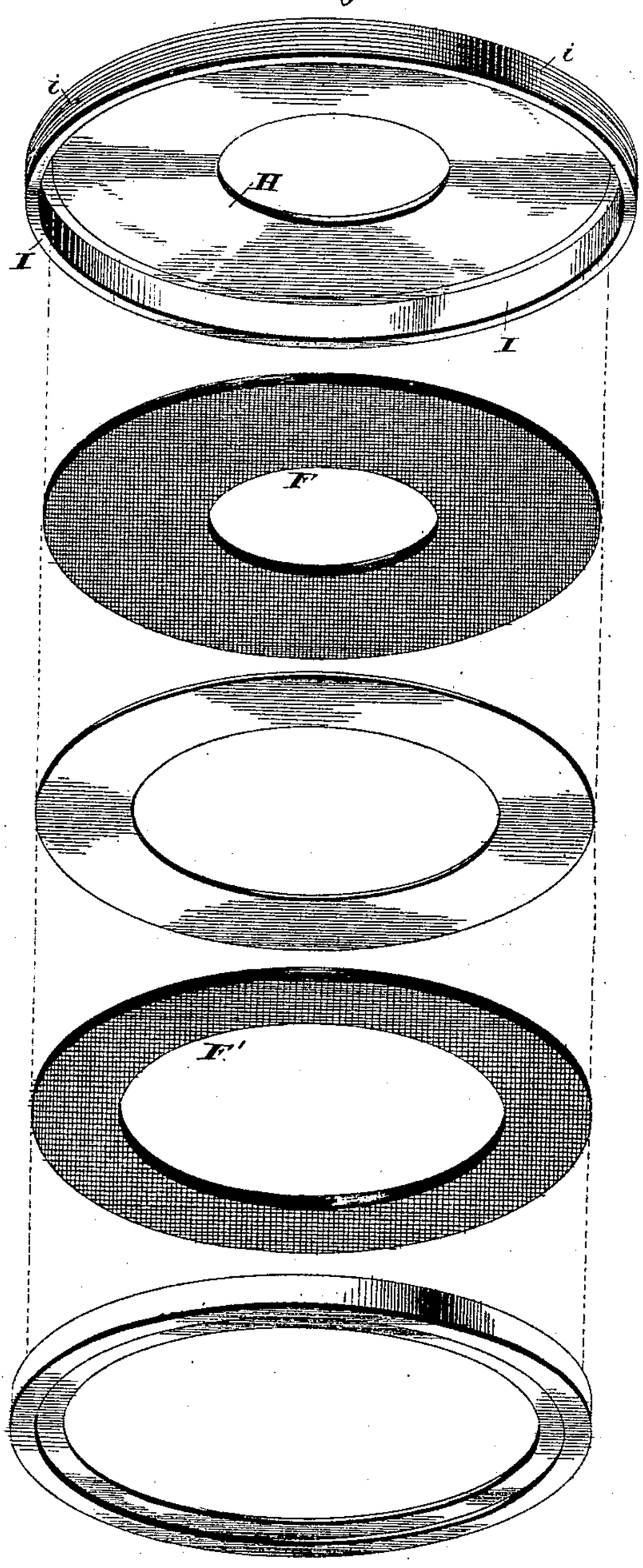
4 Sheets—Sheet 4.

H. ABBOTT.

TYPE WRITING MACHINE.

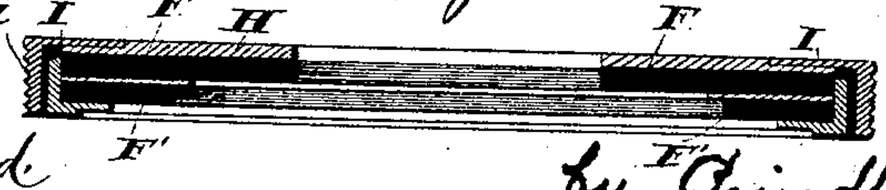
No. 437,372. Patented Sept. 30, 1890.

Fig. 5.



Witnesses
Chas. J. Williamson.
Henry C. Hazard.

Fig. 6.



Inventor
Henry Abbott,
by Crindle and Russell, his
Attorneys

UNITED STATES PATENT OFFICE.

HENRY ABBOTT, OF NEWARK, NEW JERSEY.

TYPE-WRITING MACHINE.

SPECIFICATION forming part of Letters Patent No. 437,372, dated September 30, 1890.

Application filed October 5, 1888. Serial No. 287,331. (No model.)

To all whom it may concern:

Be it known that I, HENRY ABBOTT, of Newark, in the county of Essex, and in the State of New Jersey, have invented certain new and useful Improvements in Type-Writing Machines; and I do hereby declare that the following is a full, clear, and exact description thereof, reference being had to the accompanying drawings, in which—

Figure 1 is a perspective view of my improved machine. Fig. 2 is an enlarged plan view of the type and their operating-bars from above. Fig. 3 is a vertical central section of said machine upon a line passing from front to rear. Fig. 4 is an enlarged perspective view from beneath of my improved inking-pads. Fig. 5 is a like view of the parts of the same separated from each other, and Fig. 6 is a vertical central section of said pads as combined for use.

Letters of like name and kind refer to like parts in each of the figures.

The design of my invention is, mainly, to enable upper and lower case letters to be used in a type-writing machine without material increase in the size of the machine, and, further, to enable the large and small letters to be printed with inks having different colors; to which end my said invention consists, principally, in the relative arrangement of the type, substantially as and for the purpose hereinafter specified.

It consists, further, in the means employed for moving the type against and from the printing-surface, substantially as and for the purpose hereinafter shown.

It consists, further, in the means employed for separately inking the different ranks of type, substantially as and for the purpose hereinafter set forth.

It consists, finally, in details of construction, substantially as and for the purpose hereinafter shown and described.

In carrying my invention into practice I employ a type A, which is secured upon one end of a bar B, that has its opposite end pivoted upon a crank-arm C, which crank-arm is in turn pivoted or journaled upon a horizontally-arranged fulcrum D, that is secured upon the frame E of the machine. The type-bars B and B are arranged with their fulcrums D and D upon a circular line, which is concentric with a common center, and upon such line are equidistant from each other, as shown. Said bars have equal length; but the arms *c* of the cranks vary in length, so that every other type-bar when occupying its normal position is about one-fourth of an inch farther from the center than the bars upon each side, and their types occupy the same relative positions, as shown in Fig. 2. While thus arranged, each type when moved to the inner limit of its motion will occupy the precise central position necessary for printing, the throw of the crank-arms of the outer type-bars being sufficiently greater than the throw of the crank-arms of the inner bars to compensate for the differences in the normal radial positions of said type.

It will be seen that by the staggered arrangement of the types A and A in two concentric lines said types do not interfere with or crowd each other, and also occupy a considerable less space than would be required if arranged in one line, while in consequence of differences in the paths of a type of the outer line and a type of the inner line, as shown by dotted lines of Fig. 3, each of the former is enabled to pass beneath the adjacent types of the inner row when being moved to or from the central printing position.

For the purpose of inking the types A and A, I employ two annular felt pads F and F′, which have the same outside dimensions, while interiorly said pad F has an opening which is about one-half the diameter of the opening of said pad F′. The pads F and F′ are separated by means of a washer, preferably metal, which corresponds in size and shape to the like features of said pad F′, and are then placed within a suitable recess *g*, formed within the housing G of the machine, with the outer edge of the lower pad F′ in engagement with the bottom of such recess. Upon the upper side of the pad F is now placed an annular metal plate H, that covers the same and extends inward beyond its inner edge, after which said parts are locked in place by means of a metal ring I, that is provided with a peripheral exteriorly-threaded flange *i* and fits into the recess over said parts, with its threaded periphery in engage-

ment with the correspondingly-threaded side of said recess. Each of the inking-pads thus arranged is solidly supported from above and is adapted to receive one of the rows of type. Its action is entirely separate from that of the other pad, and said pads are so thoroughly separated as to permit of the use of different colors of ink upon the same without possibility that the colors will become mixed. This construction permits of the use of a distinctive color for the capital letters, as by arranging the latter wholly within one of the lines of type and the small letters and characters entirely within the other line of type the capitals would be inked by a separate pad, and to such could be supplied any desired color of ink.

Having thus fully described my invention, what I claim is—

1. As an improvement in type-writing machines, the combination, with two series of type-levers which are normally arranged in concentric rows, of mechanism, substantially as described, whereby said type-levers may be moved upon fulcra equidistant from a printing-center in radial planes to and from said printing-center, substantially as and for the purpose specified.

2. As an improvement in type-writing machines, the combination, with two circular series of type-levers which are normally arranged in concentric rows, of mechanism, substantially as described, whereby said type-levers may be moved upon fulcra equidistant from a printing-center in radial planes to and from said printing-center, substantially as and for the purpose shown.

3. As an improvement in type-writing machines, the combination, with two series of type-levers which are normally arranged in concentric rows, and in which the printing-faces of the type of one row occupy a different horizontal plane from that of the other row, of mechanism, substantially as described, whereby said type-levers may be moved upon fulcra equidistant from a printing-center in a radial plane to and from said printing-center, substantially as and for the purpose set forth.

4. As an improvement in type-writing machines, the combination, with two series of type-carrying levers which normally are arranged in concentric rows and in contact with an ink-supply, of mechanism, substantially as described, whereby said levers may be moved upon fulcra equidistant from a printing-center in a radial plane to and from said printing-center, substantially as and for the purpose shown and described.

5. As an improvement in type-writing machines, the combination, with two series of type-levers which are normally arranged in concentric rows, of mechanism, substantially as described, whereby the levers of one row may be given a greater degree of movement than the levers of the other row, all of the levers of both series moving upon fulcra equidistant from a printing-center, substantially as and for the purpose specified.

6. As an improvement in type-writing machines, in combination with type-bars arranged in lines that are radial to a common center and are equidistant from each other, crank-arms that are journaled in a line concentric therewith and are provided with arms that relatively are alternately long and short, each of which arms is pivotally connected with one of said type-bars, substantially as and for the purpose shown.

7. As an improvement in type-writing machines, in combination with type-bars that carry type upon their inner ends, are arranged equidistant from each other upon lines radial to a common center, and are adapted to have their type moved to or from the same and supported by and vibrated on fulcra equidistant from said center, actuating mechanism, substantially as shown, whereby when at rest each alternate bar and its type are farther from the center than the adjacent bars, substantially as and for the purpose set forth.

8. As an improvement in type-writing machines, in combination with type which when at rest are arranged at relatively equidistant points upon two lines that are concentric with each other and with a common printing-center, two separate annular inking-pads which are arranged in different horizontal planes, have different diameters, and are each adapted to have contact with one of such lines of type, substantially as and for the purpose shown.

9. As an improvement in type-writing machines, in combination with type-carrying levers which when at rest are arranged in two concentric rows and have their printing characters occupying different elevations, two annular inking-pads that are combined so as to bring the face of one into position for contact with the upper series of type and the face of the other into position for contact with the lower series of type, substantially as and for the purpose specified.

10. As an improvement in type-writing machines, in combination with type which when at rest are arranged in two concentric lines, an annular inking pad that is adapted to have contact with the outer line of type, an annular inking-pad which is adapted to have contact with the inner line of type, an annular metal plate separating such pads, and an annular metal plate that is placed upon the upper pad and operates as a backing for the same, substantially as and for the purpose shown.

In testimony that I claim the foregoing I have hereunto set my hand this 5th day of September, 1888.

HENRY ABBOTT.

Witnesses:
JOHN W. COMBS,
ALBERT KAMP.