

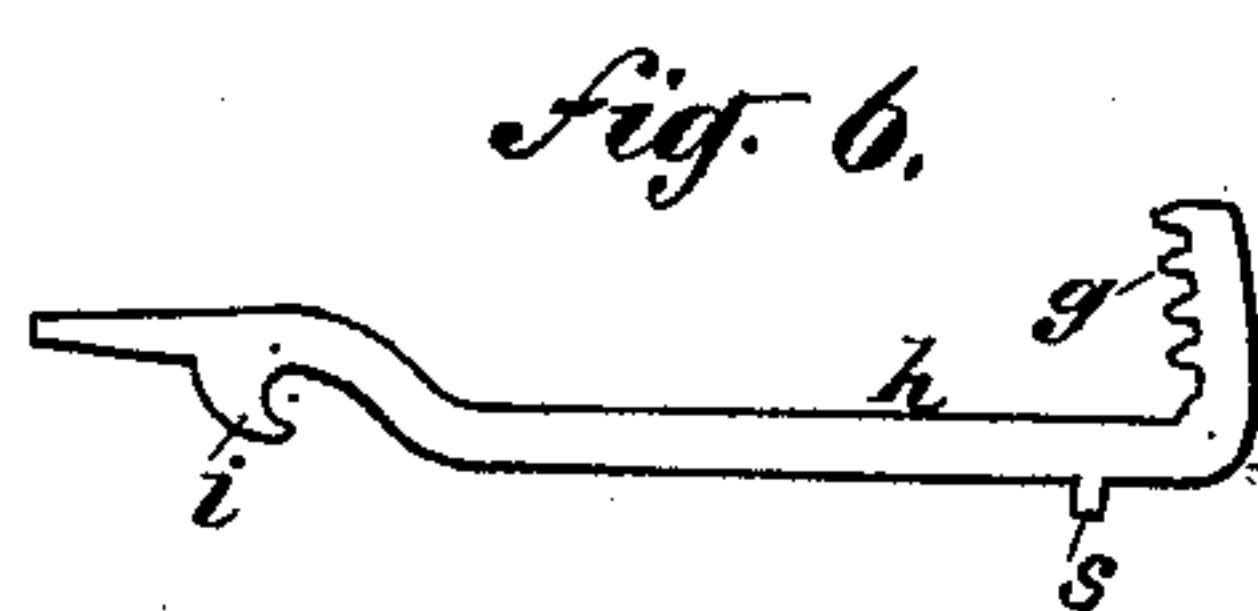
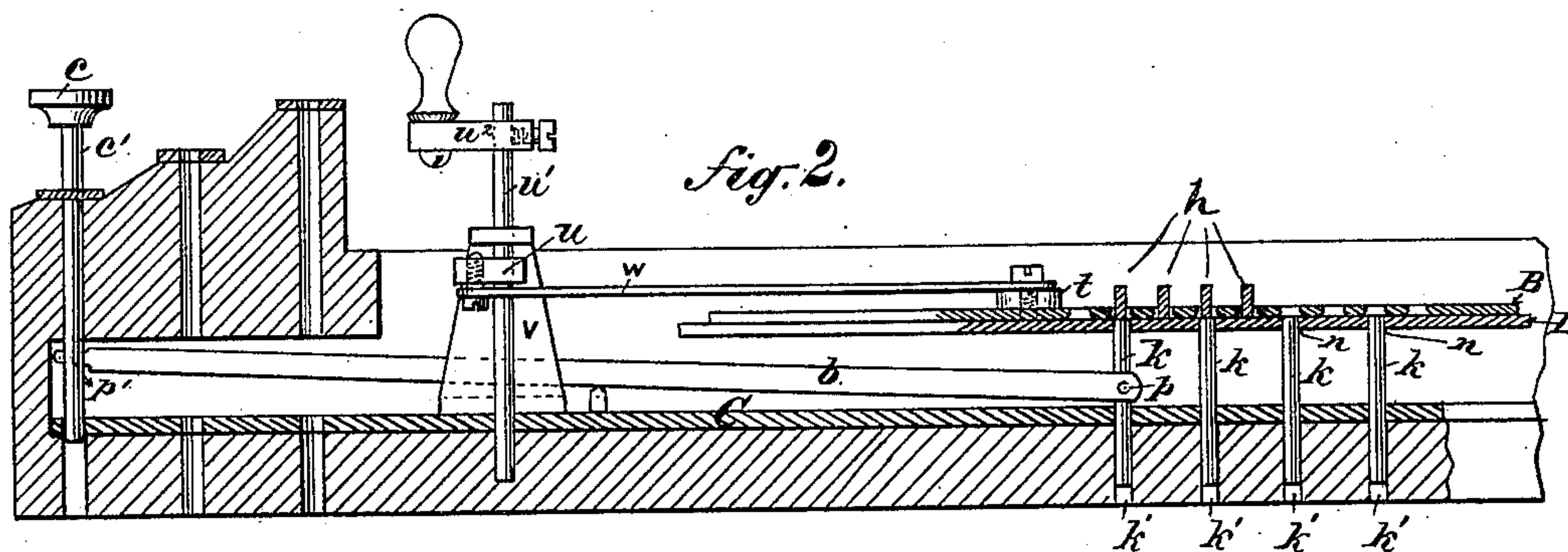
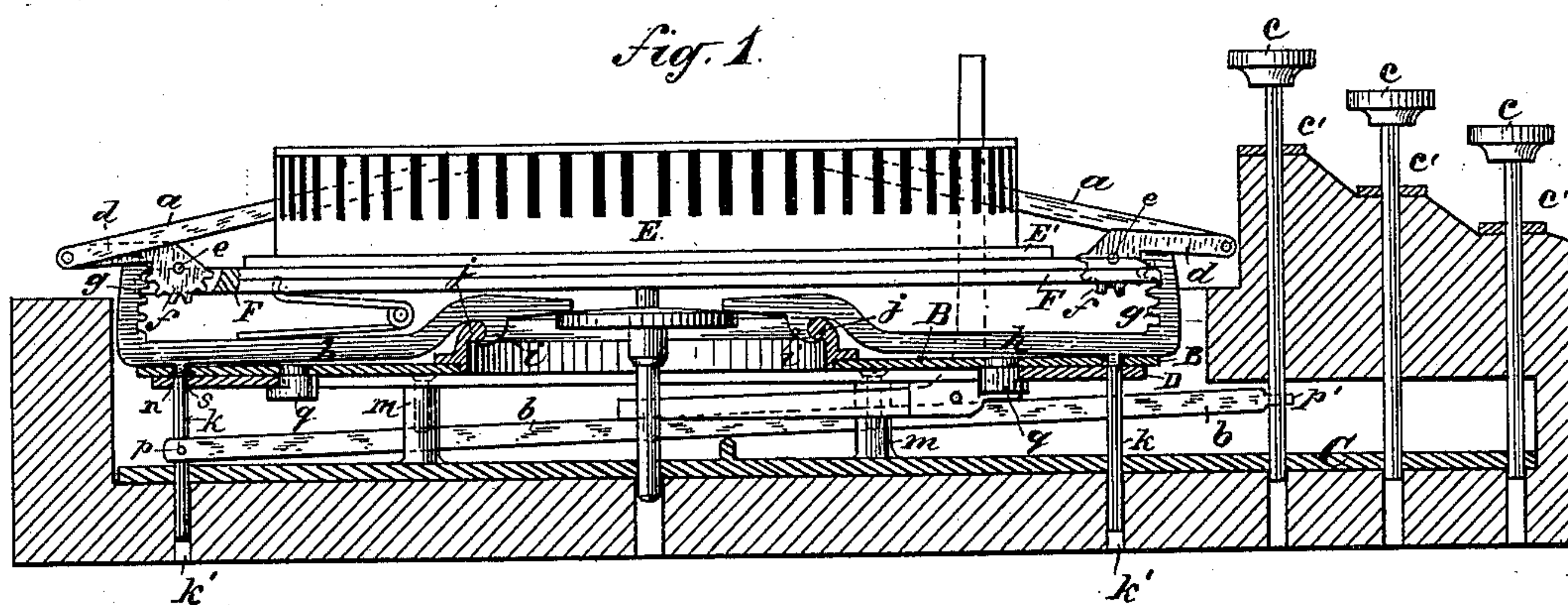
(No Model.)

3 Sheets—Sheet 1.

E. M. HAMILTON.
TYPE WRITING MACHINE.

No. 427,858.

Patented May 13, 1890.



Witnesses:

Heur y Eickling.

A. J. M. Wernick

Inventor

Emory M. Hamilton

by S. P. Hitch

his Atty

(No Model.)

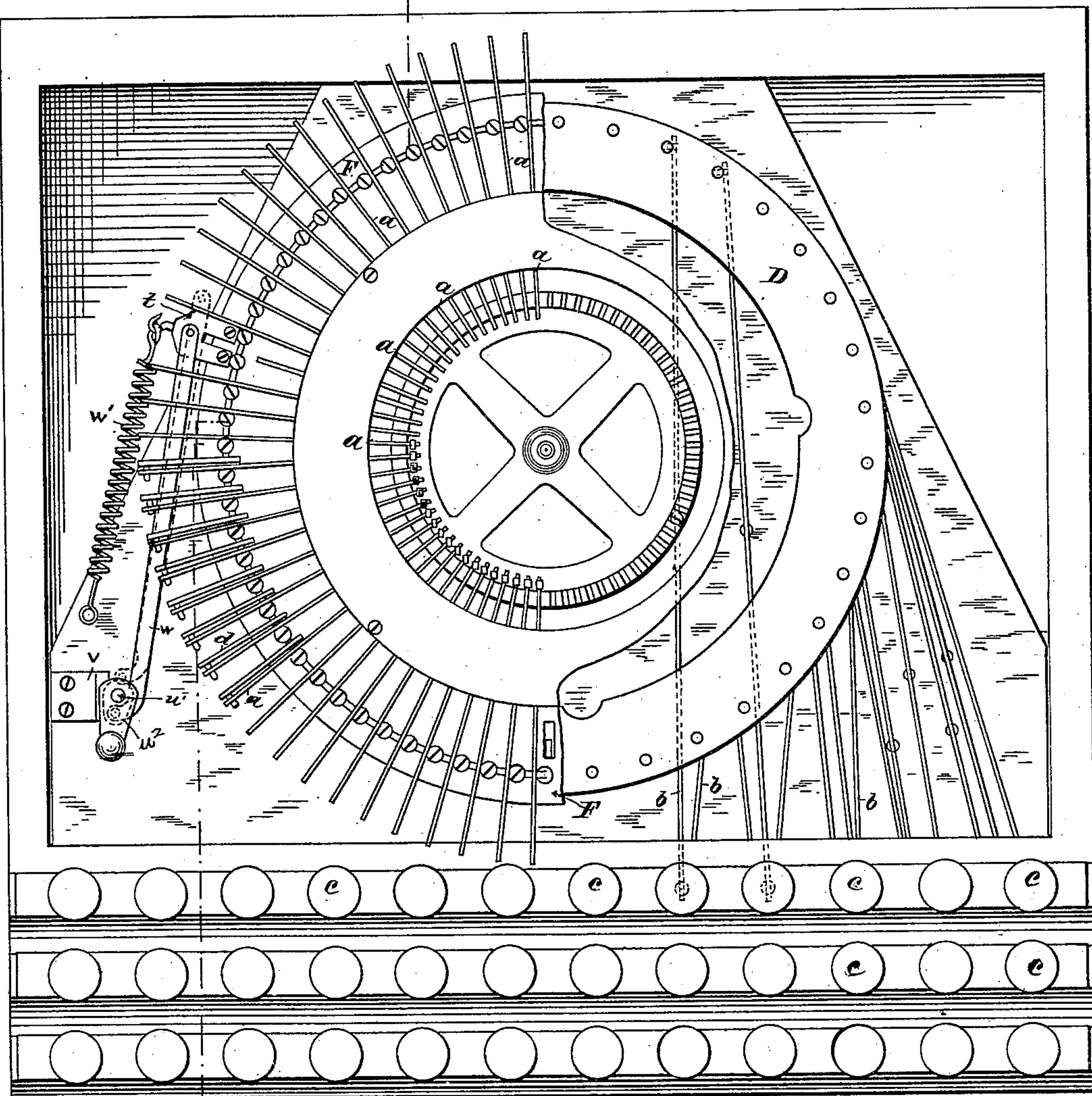
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E. M. HAMILTON.
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Fig. 3.



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(No Model.)

3 Sheets—Sheet 3.

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Fig. 4

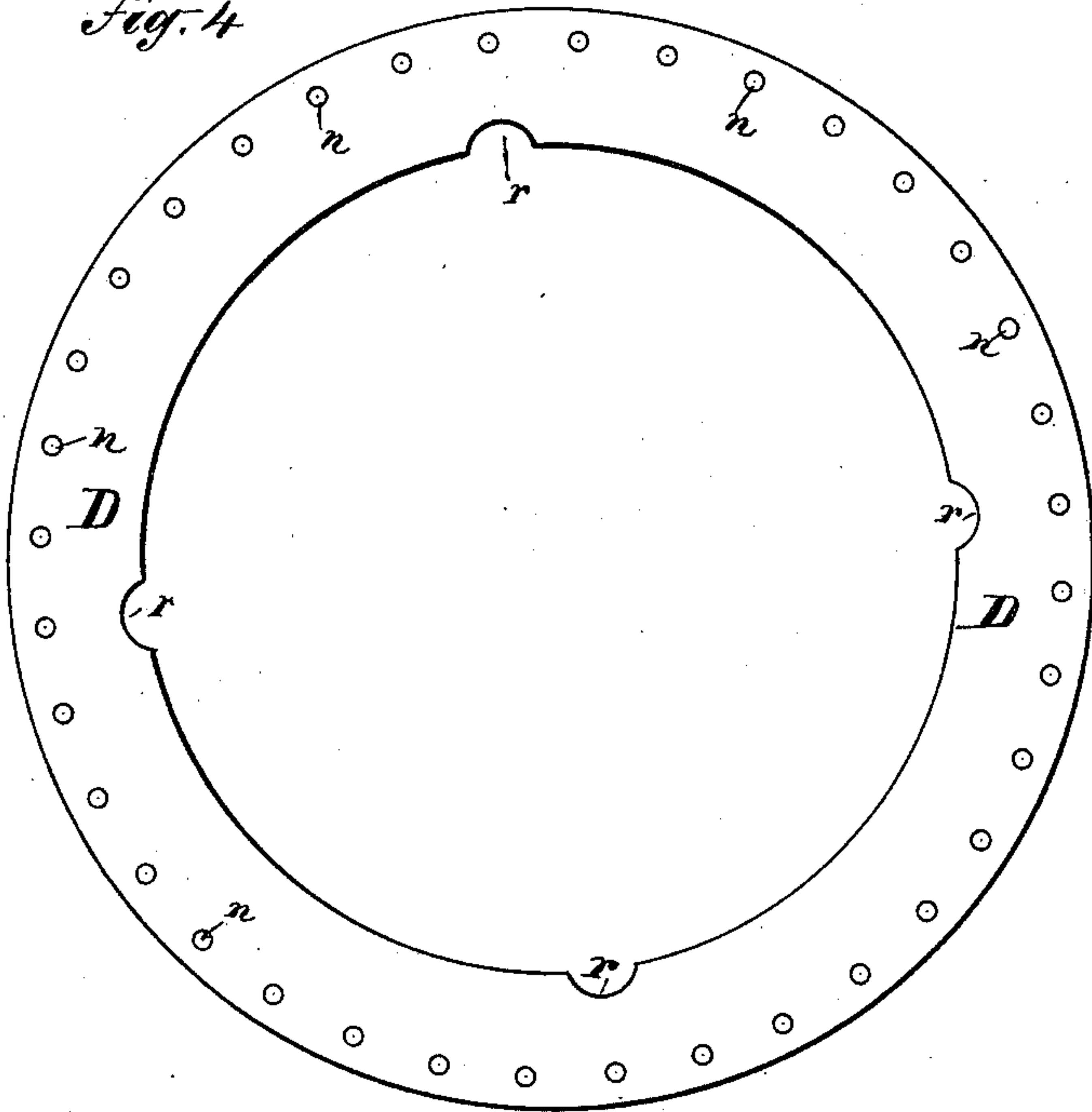
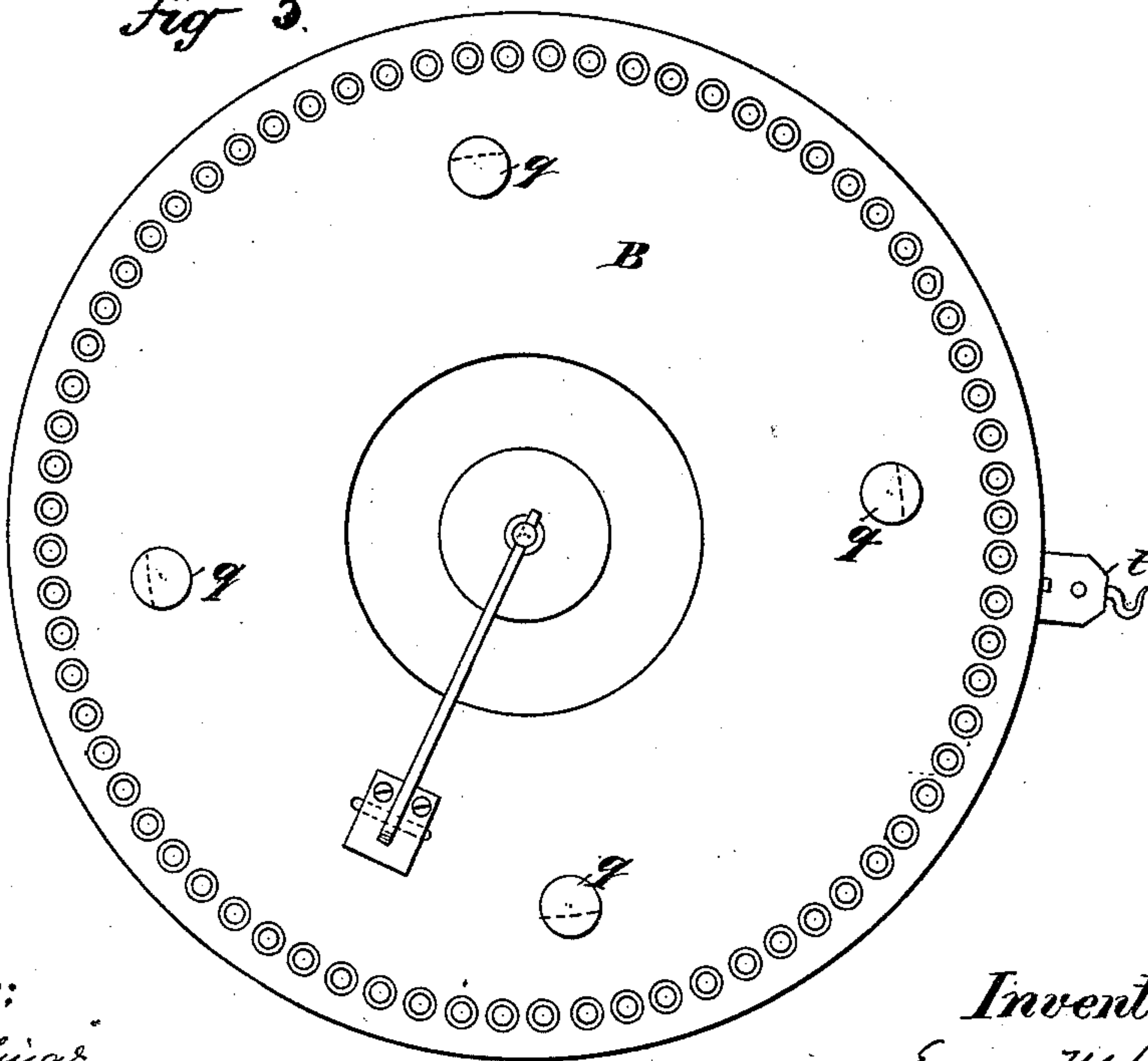


Fig. 5



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UNITED STATES PATENT OFFICE.

EMERY M. HAMILTON, OF NEW YORK, N. Y., ASSIGNOR TO THE HAMILTON
TYPE WRITER COMPANY, OF SAME PLACE.

TYPE-WRITING MACHINE.

SPECIFICATION forming part of Letters Patent No. 427,858, dated May 13, 1890.

Application filed March 31, 1885. Serial No. 160,737. (No model.)

To all whom it may concern:

Be it known that I, EMERY M. HAMILTON, of the city of New York, in the county and State of New York, and a citizen of the United States of America, have invented certain new and useful Improvements in Type-Writing Machines, of which the following is a specification, reference being had to the accompanying drawings, forming part of the same, in which—

Figure 1 is a view, partly a vertical central section and partly a side elevation, of a type-writing machine containing my invention. Fig. 2 is a vertical section on line $x x$, Fig. 3. Fig. 3 is a top view of said machine, certain portions being removed; and Figs. 4, 5, and 6 are detail views of parts of the same.

My present invention relates only to certain special features of this machine. It will therefore be unnecessary to particularly describe the parts not embraced in my present claims.

My invention has for its main object to provide a type-writing machine wherein one finger-key may be used to actuate two or more type-bars; and it consists in the various features of construction and combinations and arrangements of devices hereinafter more fully described, and particularly pointed out in the appended claims.

The machine containing the improvements which I intend to claim herein may be generally described as consisting of a series of horizontal or nearly horizontal type-levers radially arranged around a circle and bearing on their inner ends the types, their outer ends being pivoted to a series of crank-arms by a rocking movement of which the type-levers are moved toward and from the center of the circle where the printing impression is effected, the rocking movement being communicated to the crank-arms by the operator by means of keys and suitable intermediate lever devices. This general construction of machine forms the subject-matter of Letters Patent No. 357,666, February 15, 1887. In Fig. 3 these type-levers, key-levers, and keys are represented. For convenience and clearness of representation a portion of the type-

levers are shown on one side of the figure and the key-levers on the other side, all those portions of the machine lying over the key-levers on the right-hand side and over the type-levers on the left-hand side of the machine being removed to exhibit said levers.

a indicates the type-levers, and d crank-arms, to which the outer ends of the said levers are pivoted. The latter project from short shafts e , journaled in suitable bearings that rest on a plate or disk F . On these arms d are formed toothed segments, as seen plainly at f , Fig. 1.

h indicates a series of rack-levers, the outer ends of which are turned upward and have formed on them teeth g , constituting them racks which mesh with the toothed segments f . The said rack-levers h are fulcrumed at i on an upwardly-projecting annular flange j , that fits into and rests upon the inner edge of an annular plate B . The upward movement of the racks g rocks the crank-arms to throw the inner ends of the type-levers carrying the types to the center of the system, and their reverse motions return said levers to their first position. (Shown in Fig. 1.) The upward movement of the long arms of said levers h with the racks g is given by means of a series of pins or short shafts k , that are arranged to move up and down in holes or recesses k' in the bed-plate C , Fig. 2, of the machine. The upper ends of these shafts enter and are supported in a series of holes n in an annular plate D , which is supported upon posts $m m$ above the bed-plate C , so as to leave space between C and D for the key-levers b . The said key-levers are pivoted at one end to the said shafts k , as at p , Figs. 1 and 2, the opposite ends engaging with the shafts of the keys c , as at p' , in said figures.

E is an upwardly-projecting annular flange formed on an annular plate E' , that rests upon the annular plate F , which is itself supported on pillars (not shown) that project upward from plate B . The flange j , before referred to, on which are fulcrumed the levers h , together with the said levers, the crank-arms d , the levers a , and flange E , all rest

upon the plate B, the levers *a* passing through vertical slots or openings (shown in heavy black lines) in the flange E and being fulcrumed on the bottom of the said slots or openings.

This machine, so far as above described, will be found substantially shown and described in the patent aforesaid.

In the present machine the type-levers and their accessories—the slotted flange E, the crank-arms *d*, and the rack-levers *h*—are mounted upon a plate, disk, annulus, or carrier, which is separate or detached and capable of a rotary motion, the axis of which is coincident with the center of the system or series of radial type-levers *a* and with the printing or impression point. To this end the plate B is arranged to rest loosely upon the annular plate D, that is fixedly supported on posts *m*, that rise from the bed-plate C. The plate B is secured and centered upon the said plate D by means of studs *g*, which project down below the lower surface of the plate D within the said plate, the said studs being notched on their outer sides, as seen in Fig. 1, and so arranged that when the plate B is laid down centrally upon the plate D, as hereinafter described, the inner edge of the said annular plate D will be just in contact with the bottom of the said notches. By this arrangement the plate B is held centrally upon the annulus or plate D, and may be rotated centrally thereon. Four of these studs are preferably used, as shown in Fig. 5.

Fig. 4, represents notches cut in the inner edge of the annulus D, through which in laying down the plate B upon the plate D, the portions of the ends of the studs *g*, forming the lower side walls of the notches cut in said studs, may pass. After passing such portions of the studs through the notches in plate D, by shifting the plate B upon said plate D the former is locked upon the latter, while it may still rotate upon it, as before described. By this arrangement there may be included in the system a sufficient number of type-levers to carry the type for both the capitals and lower-case letters of the alphabet, besides the punctuation-marks and other desired characters, each lever carrying only one type, and each key may be made to actuate successively more than one type-lever. These levers are preferably arranged with the capitals and the lower-case type respectively adjoining each other—that is to say, each capital has its corresponding lower-case letter lying next to it, so that the type-levers are, in fact, in pairs, each pair carrying a capital and a lower-case letter.

In the drawings are shown only one key and key-lever for each pair of the type-levers, each key-lever being adapted to actuate successively both of the type-levers of one of the said pairs.

The holes in the plate B, into or through which the upper ends of the shafts *k* enter when thrown upward by the key-levers, are

equal in number to the type-levers, and upon the lower edges of the rack-levers are preferably formed small projections *s*, as seen plainly in Fig. 6, said figure representing a side view of one of the said rack-levers *h*. These projections, when the outer ends of the said levers are depressed, enter the said holes in the plate B, and when the shafts *k* are raised by the levers *b* the upper ends of the said shafts push against the said projections, and thus force upward the outer ends of the levers *h*. These projections are not essential, and the said shafts may be pushed up directly against the edge of the said levers; but the construction shown in the drawings is the preferable one, as the said projections tend to hold the outer ends of the said levers *h* steadily in place and insure contact of the shafts *k* with them. Now it is obvious that when the plate B, with the parts resting upon it, is in position with the levers *h*, which actuate the levers *a*, carrying the capital letters, standing immediately over the shafts *k*, the depression of any one of the keys will operate the type-lever with which it is connected, and thus print a capital letter. Then if the plate B, with its accessories, is shifted so as to bring the levers *h*, that actuate the type-levers carrying the lower-case type over said shafts *k*, the depression of any one of the keys will in the same way print a lower-case letter. Thus the shifting of the plate B from the printing of capitals to lower-case letters, and vice versa, needs to be only the distance between two contiguous levers *h*. The devices for effecting this shifting movement are the following:

Projecting from the edge of the plate B is a short arm *t*. *u* is a crank-arm fixed on an upright shaft *u'*, journaled in a bracket *v* at the upper end and at the lower end in a hole or socket in the plate C. *w* is a connecting-rod, one end pivoted in the said crank-arm and the other in the arm *t*. The throw of this crank-arm *u* is equal to the distance between the centers of two of the contiguous levers *h*. On the upper end of the shaft *u'* is secured a crank *w'*, by means of which the said shaft may be rotated by the hand of the operator. The shifting of the plate B in one direction is accomplished by giving a half-rotation to the shaft *u'* and the shifting in the reverse direction by a reverse half-rotation of the said shaft.

w' is a spiral spring connected to the arm *t*, which acts in the direction of rotation of the plate B from right to left, and so when the said plate is in the position shown in Fig. 3 said spring acts to hold said plate and the crank *u* in that position. When from said position the crank is rotated to shift the said plate in the direction from left to right, the crank, being reversed, is carried slightly beyond its axis and until stopped against the bracket *v*, when the said spring *w'* will act to hold it firmly in that position.

The operation of this machine is as follows:

When the levers *h*, that are connected with the type-levers carrying the lower-case type, are in position immediately over the shafts *k* lower-case letters only will be printed. Then, if it is desired to print capital letters, by giving the crank *u* a half-turn the frame or plate carrying the type-levers and their connected actuating-levers is shifted, so as to bring the levers *h*, that are connected with the type-levers carrying the capitals, over the shafts *k*, when only capital letters will be printed.

I do not intend here to limit myself to the precise devices which I have described and shown, by which a series of type-levers together, carrying the types for capital and lower-case letters, are actuated in printing by a series of key-levers and keys, each of which is enabled to actuate alternately one or the other of a pair of type-levers. My invention here consists, essentially, in mounting the type bars or levers upon a frame, plate, carrier, or annulus capable of rotation and combining therewith a series of key-levers, each of which is enabled by such rotation or a shifting of the said rotary part of the machine to actuate successively more than one of the type-levers.

This machine is provided with a paper-carriage for carrying and presenting the paper to the type actuated by the movement of the key-levers; but I do not deem it necessary to describe or represent the same, as it constitutes no part of my present invention.

What I claim as my invention, and desire to secure by Letters Patent, is—

1. The combination of a rotatory annulus or carrier provided with a series of type-bars, a series of key-levers less in number than the type-bars, and detached connections between the key-levers and the type-bars, whereby one key-lever may operate a plurality of type-bars.

2. The combination of a rotatory annulus or carrier, type-bars arranged in sets thereon, and key-levers adapted each to a set of said bars and bearing means of engagement with one or the other of the bars of each set.

3. The combination of a pivoted carrier, type-bars pivoted to and arranged in sets on

said carrier, and a series of key-levers, one for each set of type-bars.

4. The combination of a pivoted carrier, type-bars pivoted to and arranged in sets on said carrier, a series of key-levers arranged one for each set of type-bars, and a lever constructed to turn the type-carrier.

5. The combination of a pivoted annular carrier, type-bars arranged thereon, a crank, and a connecting-rod.

6. In a type-writing machine, the combination of two series of type-levers arranged together radially in or nearly in a horizontal plane and carrying, one series the types for capital letters and the other series types for the lower-case letters of the alphabet, with a series of levers equal in number to both series of type-levers and adapted to actuate the said type-levers to move the type to and from the center of the system for printing, all of said levers being mounted on a plate or frame capable of a rotary movement, as and for the purpose described.

7. The combination, with the type-levers *a*, and type-actuating levers *h*, mounted on the described rotary plate or frame, of key-levers *b*, mounted in a stationary frame, together with intermediate mechanism, substantially as described, whereby the movement of the several key-levers may actuate successively more than one of the type-levers, as and for the purpose described.

8. The combination, with the rotary plate *B*, and the series of levers *a* and *h* mounted thereon, of the crank *u* and connecting-rod *w*, as and for the purpose described.

9. The combination of the plate *B*, provided with the notched studs *g*, and on which are the described series of levers *h*, with the annular plate *D*, provided on its inner edge with the notches *r*, whereby the plate *B* is locked down upon the plate *D* while it is permitted to rotate thereon, as and for the purpose described.

EMERY M. HAMILTON.

Witnesses:

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