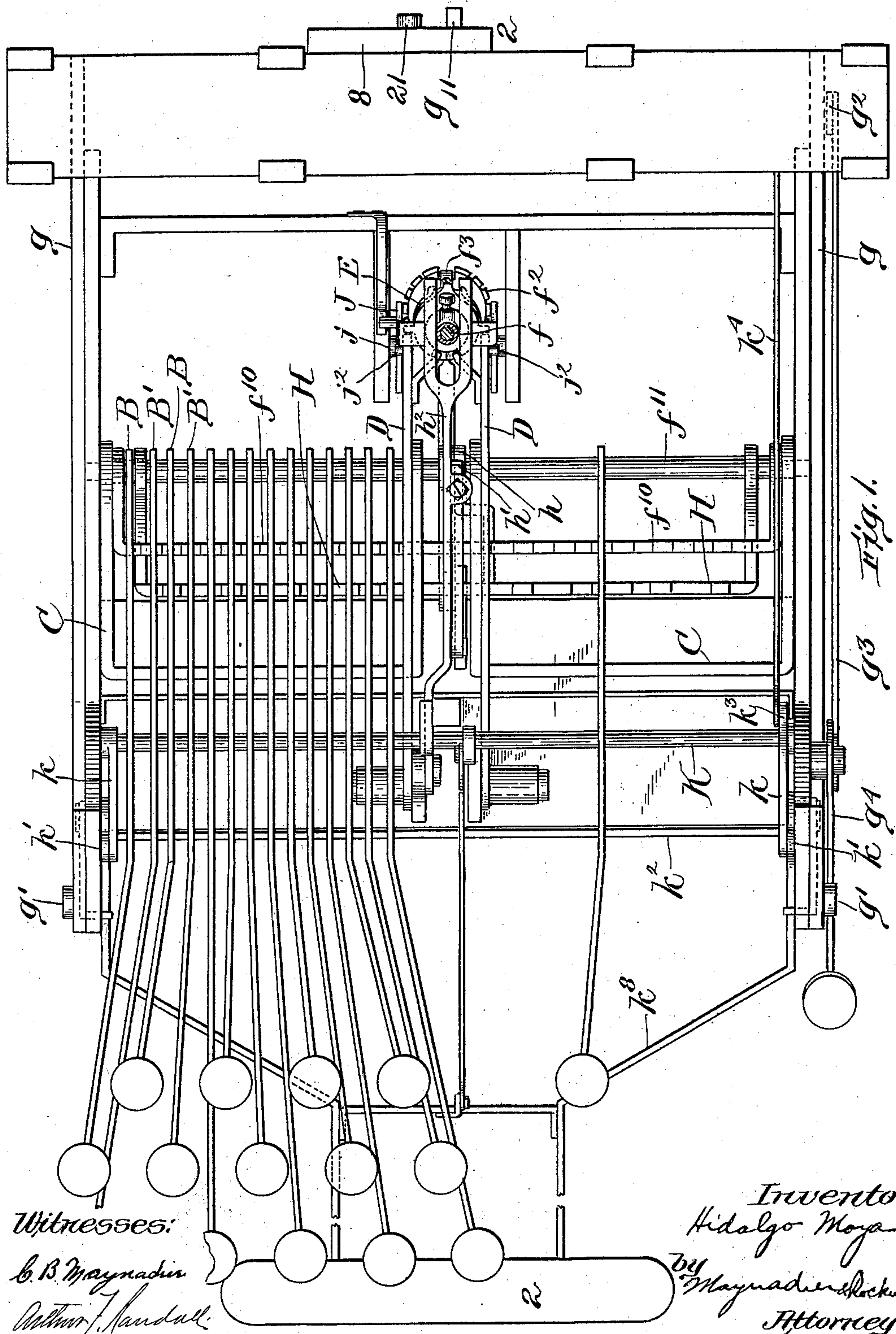


PATENTED FEB. 23, 1904.

APPLIOATION FILED MAR. 4, 1903.

6 SHEETS—SHEET 1.



No. 752,795.

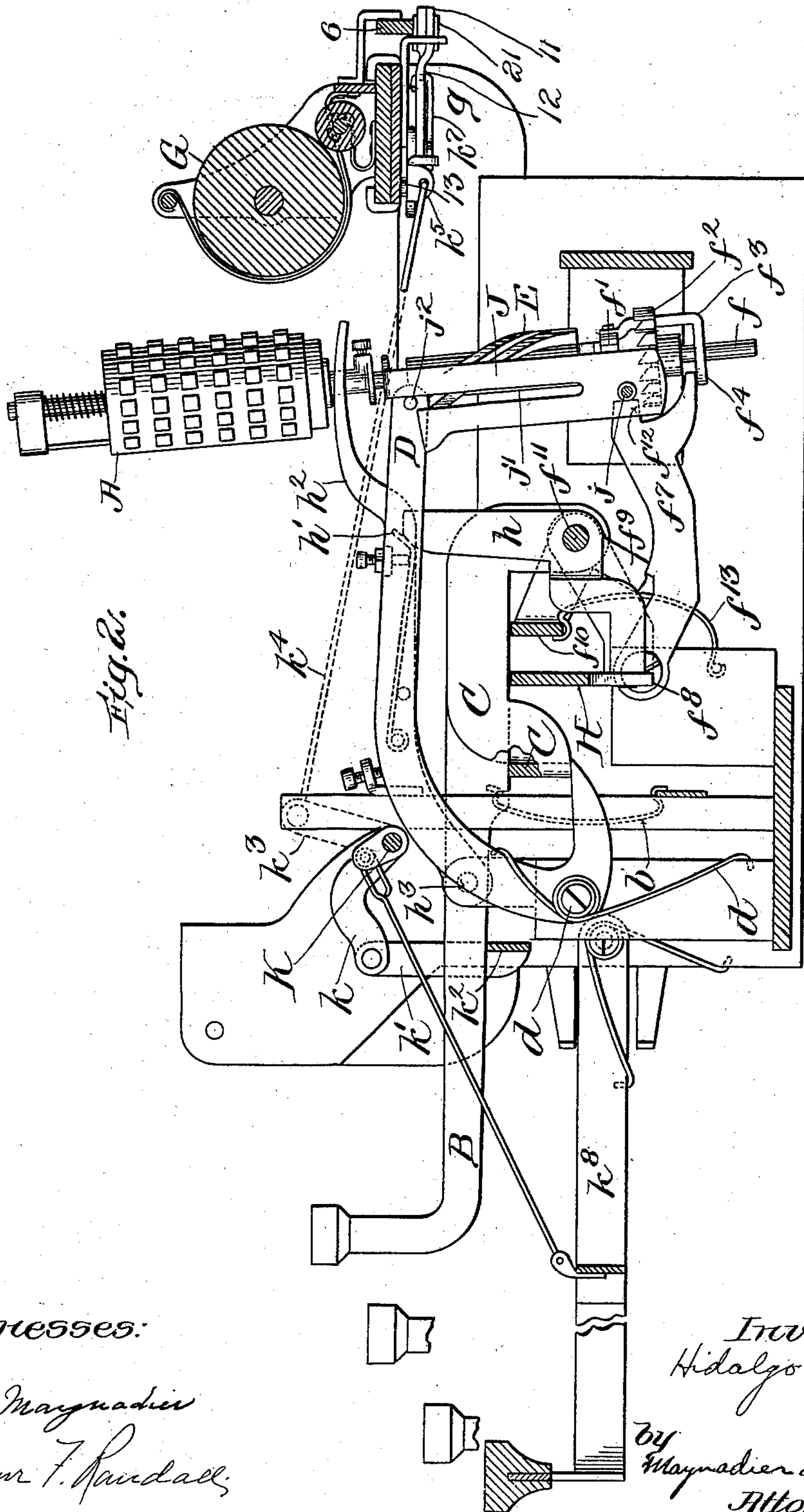
PATENTED FEB. 23, 1904.

H. MOYA.
TYPE WRITER.

APPLICATION FILED MAR. 4, 1903.

NO MODEL.

6 SHEETS—SHEET 2.



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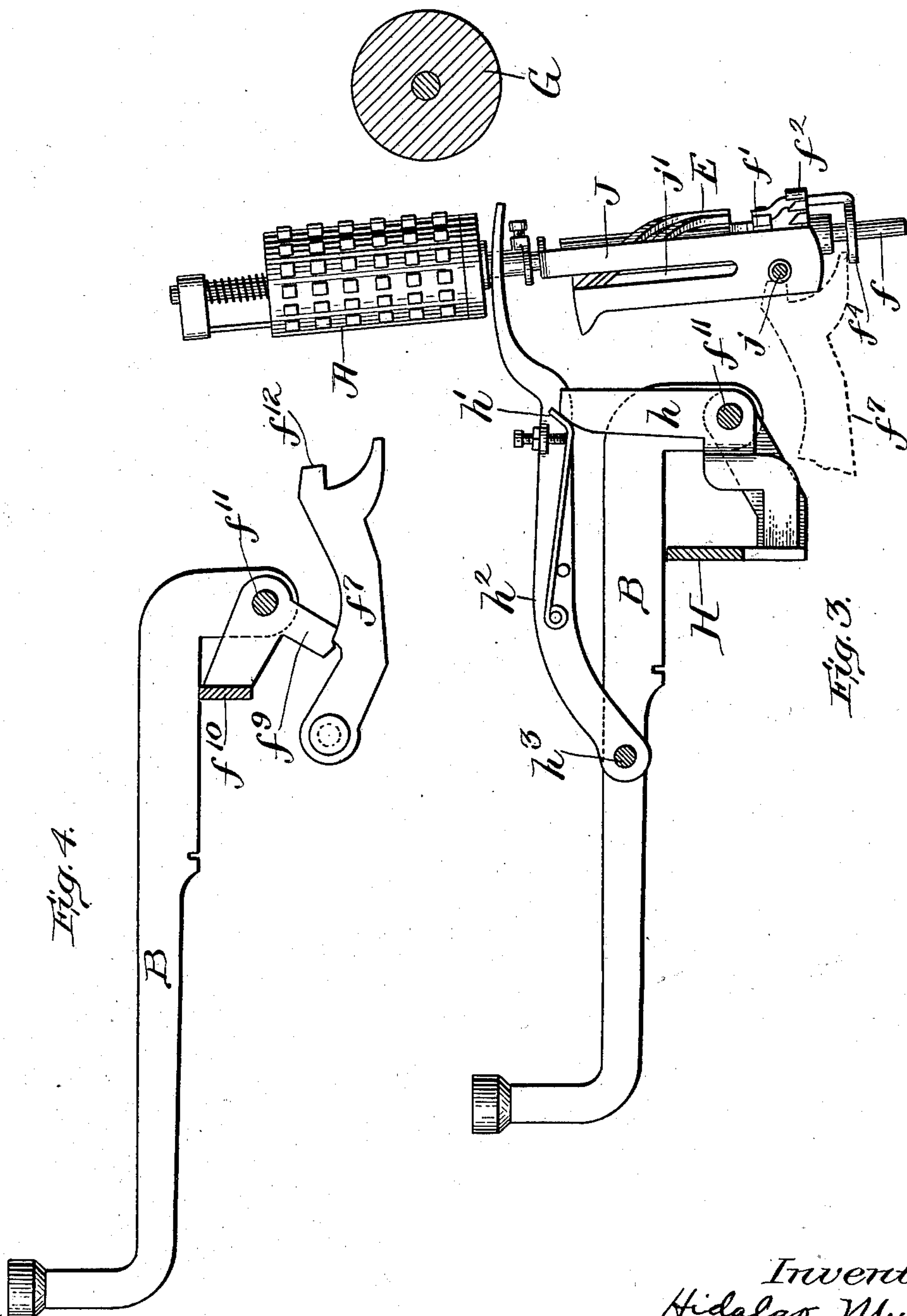
PATENTED FEB. 23, 1904.

H. MOYA.
TYPE WRITER.

APPLICATION FILED MAR. 4, 1903.

NO MODEL.

6 SHEETS—SHEET 3.



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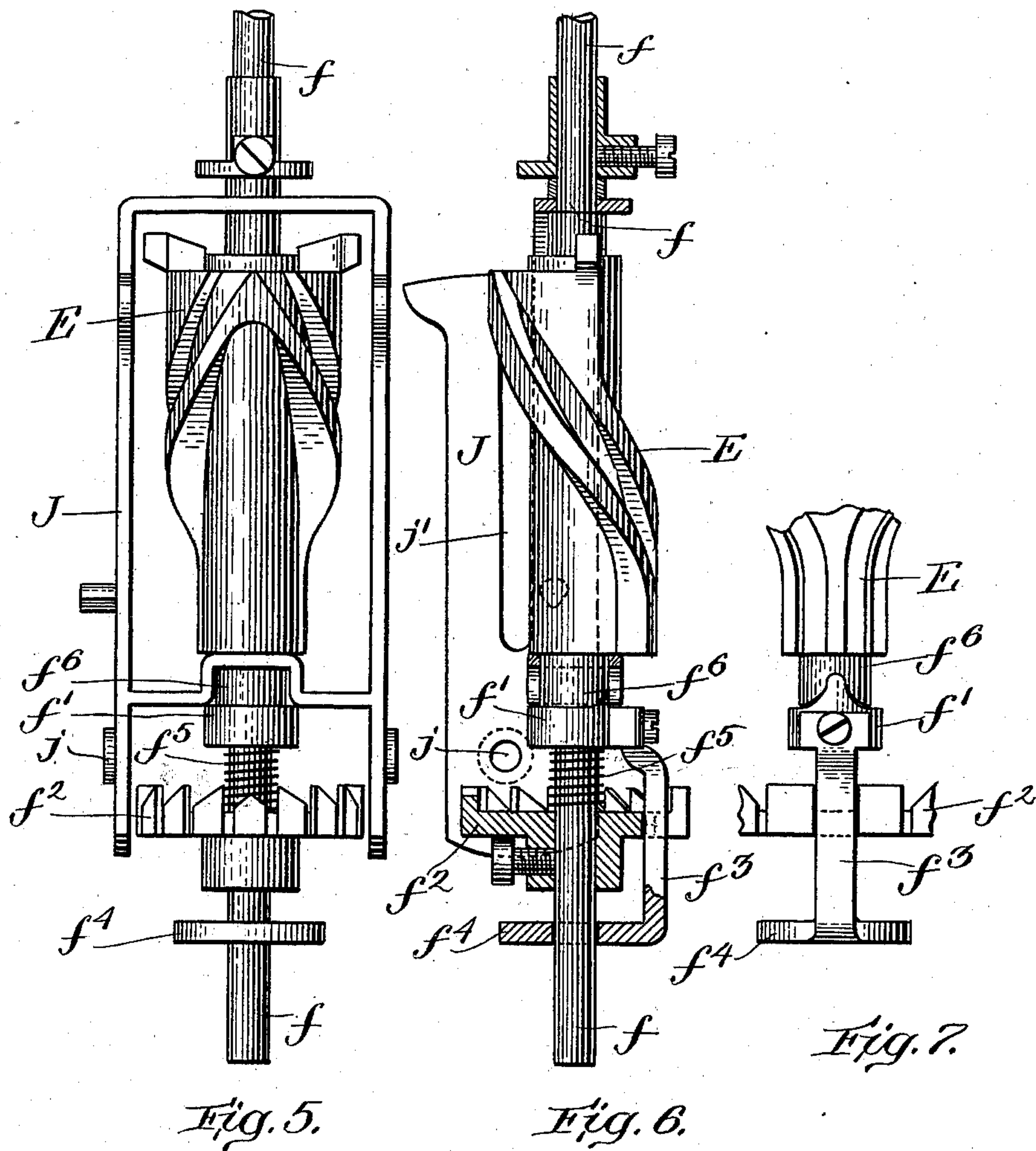
PATENTED FEB. 23, 1904.

H. MOYA.
TYPE WRITER.

APPLICATION FILED MAR. 4, 1903.

NO MODEL.

6 SHEETS—SHEET 4.



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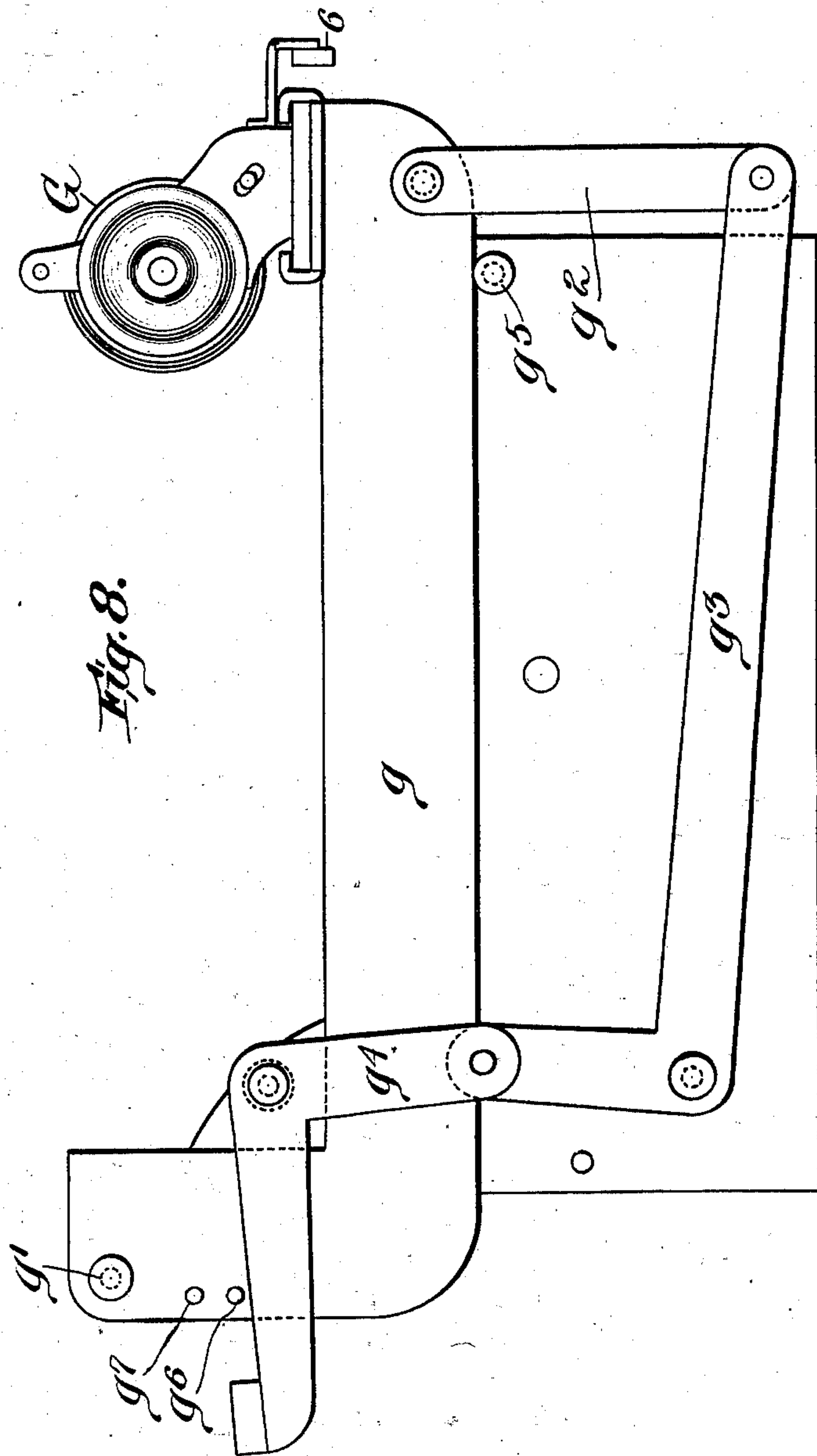
PATENTED FEB. 23, 1904.

H. MOYA.
TYPE WRITER.

APPLICATION FILED MAR. 4, 1903.

NO MODEL.

6 SHEETS—SHEET 5.



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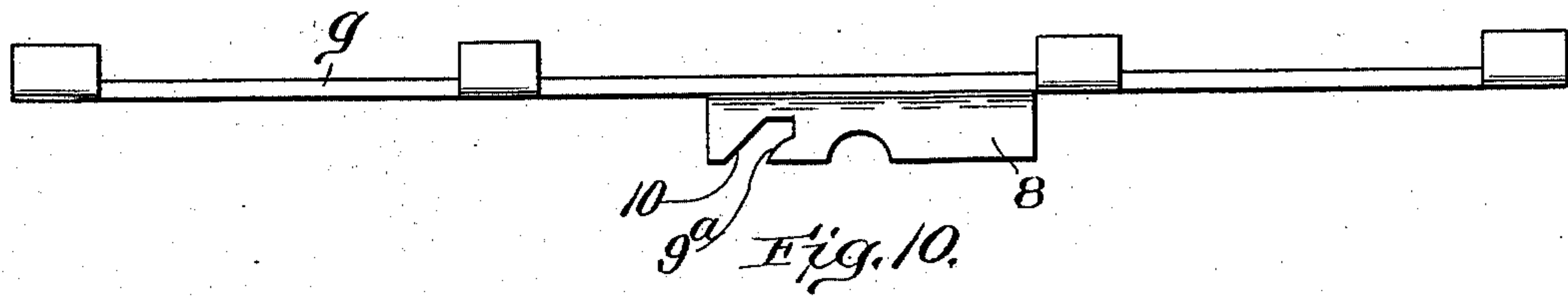
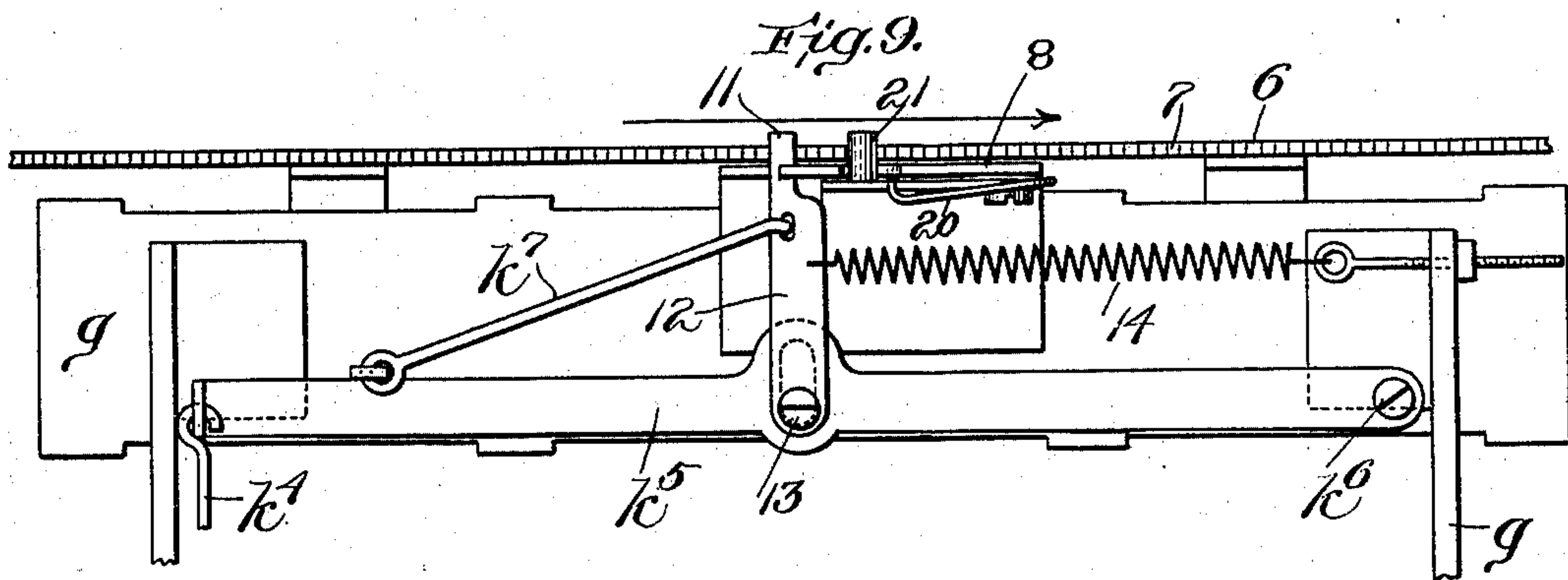
PATENTED FEB. 23, 1904.

H. MOYA.
TYPE WRITER.

APPLICATION FILED MAR. 4, 1903.

NO MODEL.

6 SHEETS—SHEET 6.



Witnesses:

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UNITED STATES PATENT OFFICE.

HIDALGO MOYA, OF LEICESTER, ENGLAND.

TYPE-WRITER.

SPECIFICATION forming part of Letters Patent No. 752,795, dated February 23, 1904.

Application filed March 4, 1903. Serial No. 146,152. (No model.)

To all whom it may concern:

Be it known that I, HIDALGO MOYA, a citizen of the United States, and a resident of Leicester, in the county of Leicester, England, have invented an Improved Type-Writer, of which the following is a specification.

My invention relates to type-writers, and is an improvement on the type-writer described in my application, Serial No. 125,037, filed September 27, 1902. In that application I have described a type-writer in which the characters are each brought into a position ready to make an impression at the proper place on the paper by the movement of a type-wheel about the axis of which the characters are arranged in circumferential rows and also in crossing rows, so that all the characters in any crossing row can be brought into a certain relation with the paper-roll, and the paper-roll is then moved sidewise to bring it into printing relation with any one of the characters in that crossing row; and my present invention consists in a type-writer of that class in which the type-wheel can be thrown forward as a hammer to make the impression after the proper crossing row has been selected by the angular motion of the type-wheel and the proper type in that crossing row has been selected by the sidewise motion of the paper-roll. While this is the distinguishing characteristic of my present invention and while it is due to this feature mainly that I am enabled to largely reduce the number of parts, and thereby greatly simplify the construction and operation of my improved type-writer, yet other features of my invention explained below and defined in the claims have much to do with the practical attainment of these objects—namely, firmness of parts, simplicity of construction and operation, and also economy in building and durability in use.

In the drawings, Figure 1 is a plan view, with parts removed for clearness, of my improved machine. Fig. 2 is a section through 2 2 of Fig. 1. Fig. 3 is a detail of the means for moving the type-wheel endwise. Fig. 4 is a detail of the clutch-operating means to connect and disconnect the cam with the shaft of the type-wheel. Figs. 5, 6, and 7 are de-

tails of the type-wheel cam, its shaft, and clutch. Fig. 8 is a detail of means for moving the paper-roll sidewise. Figs. 9 and 10 are details of means for moving the paper-roll endwise, Fig. 9 showing the under side of the supporting-frame of the paper-carriage and Fig. 10 being an elevation of part of Fig. 9.

I have shown the characters arranged on a cylinder A in six circumferential rows, each with fourteen characters, and with the characters of these circumferential rows in fourteen rows lengthwise of the cylinder, thus giving eighty-four characters in all, each one of which may be brought into the printing-plane by mechanism which moves the type-wheel A angularly to bring any lengthwise row of six characters into a plane crossing the paper-roll G. (See Figs. 2 and 3.) My mechanism for thus selecting any one of the fourteen lengthwise rows is actuated by any one of fourteen character-keys, and mechanism for moving the paper-roll sidewise selects any one of the characters in the second, fourth, and sixth circumferential rows, counting from the bottom of the type-wheel, when the proper lengthwise row has been brought into the printing-plane, while any one of the characters in the first, third, and fifth circumferential rows, counting from the bottom of the type-wheel, is selected partly by the angular motion of the type-wheel, partly by the sidewise motion of the paper-roll, and partly by the lengthwise movement of the type-wheel, so that fourteen additional keys are adapted each to give the type-wheel a lengthwise movement in addition to its angular movement. Each of the twenty-eight character-keys also gives the type-wheel a bodily motion toward the paper-roll to make the impression after the individual character has been selected, so that with twenty-eight character-keys and two keys for shifting the paper-roll I print any one of eighty-four characters.

The paper-roll has of course the usual lengthwise motion step by step for spacing for letters and words and the usual rotary motion for spacing for lines, and the usual ink-ribbon and its mechanism (not shown) is used.

The mechanism for moving the type-wheel

A angularly while resembling somewhat mechanism heretofore used for a like purpose yet differs substantially in its construction and mode of operation from any heretofore known, for the reason that it is based on a clutch connecting the shaft of the type-wheel with a cam or other shaft-actuating means and mechanism common to all the character-keys for operating the clutch to free the type-wheel shaft from the cam when the type-wheel and its shaft have been moved through the proper angle to bring the desired lengthwise row of characters into the printing-plane, so that while the cam is rotated by each character-key through substantially the same number of degrees, yet the cam is disengaged from the type-wheel as soon as the proper lengthwise row of characters is brought to position. This combination is wholly new with me and is a valuable and important feature of my invention. In its preferred form it is clearly shown in Figs. 2, 4, 5, 6, and 7.

Any character-key lever B or B' when depressed carries with it one of the frames C, which engages the levers D, pivoted at d , and the longer arms of levers D are forked, as shown in Fig. 1, the end of one tine of the fork engaging one groove of cam E and the corresponding tine of the fork of the other lever D engaging the opposed groove of cam E, so that whichever lever D is actuated the cam E is rotated, but in one direction by one lever and in the other direction by the other lever.

Cam E is mounted on shaft f , upon which type-wheel A is splined (in order that it may be moved endwise on shaft f for the purpose explained below, and cam E is connected with shaft f through a clutch whose movable member f' is splined to shaft f by disk f^2 , fast on shaft f . The clutch member f' is made with a leg f^3 and a foot f^4 , sliding on shaft f , as shown in Figs. 5, 6, and 7. Spring f^5 normally holds member f' in engagement with the other member f^6 of the clutch, fast on cam E. The foot f^4 supports the free end of shipping-lever f^7 , pivoted at f^8 , and lever f^7 is depressed by arm f^9 of frame f^{10} , pivoted on rod f^{11} . The cross-bar of frame f^{10} extends across under all of the character-keys and is stepped to vary the time during the rotation of cam E when the clutch member f' shall be operated to free shaft f from cam E, and thereby leave type-wheel A in one of its fourteen different angular positions with relation to its normal position with its neutral line in the printing-plane.

The shipping-lever f^7 carries a bolt f^{12} , which engages the rack or disk f^2 just as shaft f is unclutched from cam E, and thereby locks shaft f and type-wheel A in their desired angular position with one of the fourteen lengthwise rows of characters in the printing-plane.

When the character-key which has been de-

pressed returns to its normal position under force of its spring b , Fig. 2, the lever D returns to its normal position under force of its spring d' and returns frame C to its normal position, which permits the stepped bar f^{10} to return to its normal position under force of its spring f^{13} , and thus leaves shipping-lever f^7 free. Thereupon clutch-spring f^5 returns clutch member f' into engagement with clutch member f^6 and frees bolt f^{12} from rack or disk f^2 , so that shaft f , type-wheel A, and cam E return together to their normal position as lever D returns to its normal position. This mechanism necessitates the use of only as many character-keys as there are angular positions to which the type-wheel A must be brought—in this case fourteen, not counting the neutral position of type-wheel A—and if there were only three circumferential rows of characters on type-wheel A instead of six the sidewise motion of the paper-roll G to one of three positions would suffice to print any one of forty-two characters with only fourteen character-keys. This shifting of the paper-roll sidewise to either one of three positions is accomplished by the mechanism shown in Fig. 8, in which the carriage for the paper-roll G is mounted on frame g , pivoted at g' and actuated through link g^2 , bell-crank lever g^3 , and key-lever g^4 . When the parts are in the position shown in Fig. 8, the paper-roll G is in printing position relatively to the second circumferential row of characters from the bottom of type-wheel A, and frame g rests on stop g^5 ; but when key-lever g^4 is lifted and caught by catch g^6 the paper-roll G is in position relatively to the fourth row from the bottom of type-wheel A, and when key-lever g^4 is caught by catch g^7 it is in position relatively to the sixth row from the bottom, as will be plain without further description, for this mechanism is substantially the same as that shown in my pending application above referred to.

Any of the forty-two characters in the second, fourth, and sixth circumferential rows may thus be selected by the combined angular motion of the type-wheel and sidewise motion of the paper-roll by the use of the proper key of the fourteen keys which are used for characters in the second, fourth, and sixth circumferential rows from the bottom of the type-cylinder, and the simultaneous use of the stops g^5 , g^6 , and g^7 , each of which represents one of these circumferential rows. To provide for selecting any of the other forty-two characters in the first, third, and fifth rows from the bottom of the type-wheel A, the other fourteen keys engage, when actuated, cross-bar H, Figs. 1, 2, and 3, which is the cross-bar of a frame pivoted on rod f^{11} . This cross-bar H is slotted below the first fourteen keys B, so that neither of them will engage it, but is left whole under each of the fourteen keys B', and

whenever any key B' is depressed it carries cross-bar H with it and swings cam-arm h against cam h' , carried by fork h^2 , pivoted at h^3 and straddling shaft f below type-wheel A, thereby moving type-wheel A endwise and bringing one of the circumferential rows one, three, or five from the bottom of type-wheel A into printing relation with the paper-roll G in accordance with the then position of that roll, as before explained. When any one of the eighty-four characters has been thus brought into printing position, the impression is made by using the type-wheel as a hammer. This is done by mounting the shaft f in a swinging frame J, pivoted at j and provided with slots j' , which are engaged by the other tines j^2 of the forked levers D, so that when either of levers D is actuated the type-wheel A is not only rotated, as before described, and in some cases moved endwise, as before described, but is also thrown against the paper on the paper-roll G to make the impression.

The paper-roll is moved endwise to space letters and words by the pawl-nose 11, whose arm 12 is a spring, and the feed-rack 6, whose teeth 7 are beveled on one side, so that when pawl 12 is rocked on its pivot 13 pawl-nose 11 is sprung sidewise. The feed motion of pawl-nose 11 is imparted by rock-shaft K, on which is fast two arms k , which carry a frame k' , whose cross-bar k^2 is actuated by each of the character-keys. The rock-shaft K also carries an arm k^3 , connected by link k^4 with lever k^5 , pivoted at k^6 to the under side of the cross-bar of frame g . Lever k^5 is connected by link k^7 with pawl 12, so that the rocking of shaft K will swing pawl 12 in one direction, while the spring 14 will swing pawl 12 back, and during this back stroke of pawl 12 nose 11 engages the rack 6 and feeds paper-roll B one step. The mask-plate 8 guides nose 11 sidewise with relation to rack 6 and its teeth 7. This mechanism is substantially the same as that shown in my application Serial No. 111,805, filed June 16, 1902.

The rock-shaft K is under the control of spacing-key k^8 , as well as of the character-keys B B'.

What I claim as my invention is—

1. A type-writer comprising a type-wheel; a shaft on which the type-wheel is splined to admit it to be moved endwise on the shaft but compel it to rotate with the shaft; means to rotate the shaft; a clutch connecting the rotating means and the shaft of the type-wheel;

and means to operate that clutch to permit the rotating means to revolve through a larger angle than the shaft and type-wheel.

2. A type-writer comprising a type-wheel; a shaft on which the type-wheel is carried; a cam for rotating the shaft of the type-wheel; a clutch connecting the cam and the shaft; and means to operate the clutch and disengage the cam and its shaft when they have rotated together through the desired angle.

3. A type-writer comprising a type-wheel; a shaft on which the type-wheel is carried; a cam for rotating the shaft of the type-wheel; a clutch connecting the cam and the shaft; means to operate the clutch and disengage the cam and its shaft when they have rotated together through a desired angle, and lock the shaft while the angular motion of the cam continues; and means to shift the type-wheel along its shaft to a new position.

4. A type-writer comprising a type-wheel; a shaft on which the type-wheel is carried; an oscillatory frame in which the shaft of the type-wheel is mounted; a cam for rotating the type-wheel and its shaft; and a forked lever, one tine of which rotates the cam while the other tine oscillates the frame.

5. A type-writer comprising a type-wheel with two or more pairs of rows of characters about its axis arranged in lengthwise rows substantially parallel with its axis; a shaft on which the type-wheel is splined; means to rotate that shaft through varied angular distances and thus select any one of the lengthwise rows of characters; means to shift the type-wheel lengthwise of its shaft, and thus select one circumferential row of a pair; a paper-roll; means to shift it sidewise and thus select the desired pair of circumferential rows; and means to move the type-wheel as a hammer to impress the selected character on the paper carried by the paper-roll.

6. In combination cam-arm h ; forked lever h^2 ; type-wheel A; its shaft f between the tines of forked lever h^2 ; means for actuating cam-arm h , and thereby actuating forked lever h^2 and moving type-wheel A lengthwise of the shaft; means for rotating shaft f to give angular motion to type-wheel A; and means for swinging shaft f to cause type-wheel A to make the impression.

HIDALGO MOYA.

Witnesses:

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