No. 626,097. Patented May 30, 1899.

I. RISLEY.

TYPOGRAPHIC MACHINE.

(Application filed July 27, 1897.)

(No Model.) 4 Sheets—Sheet 1.

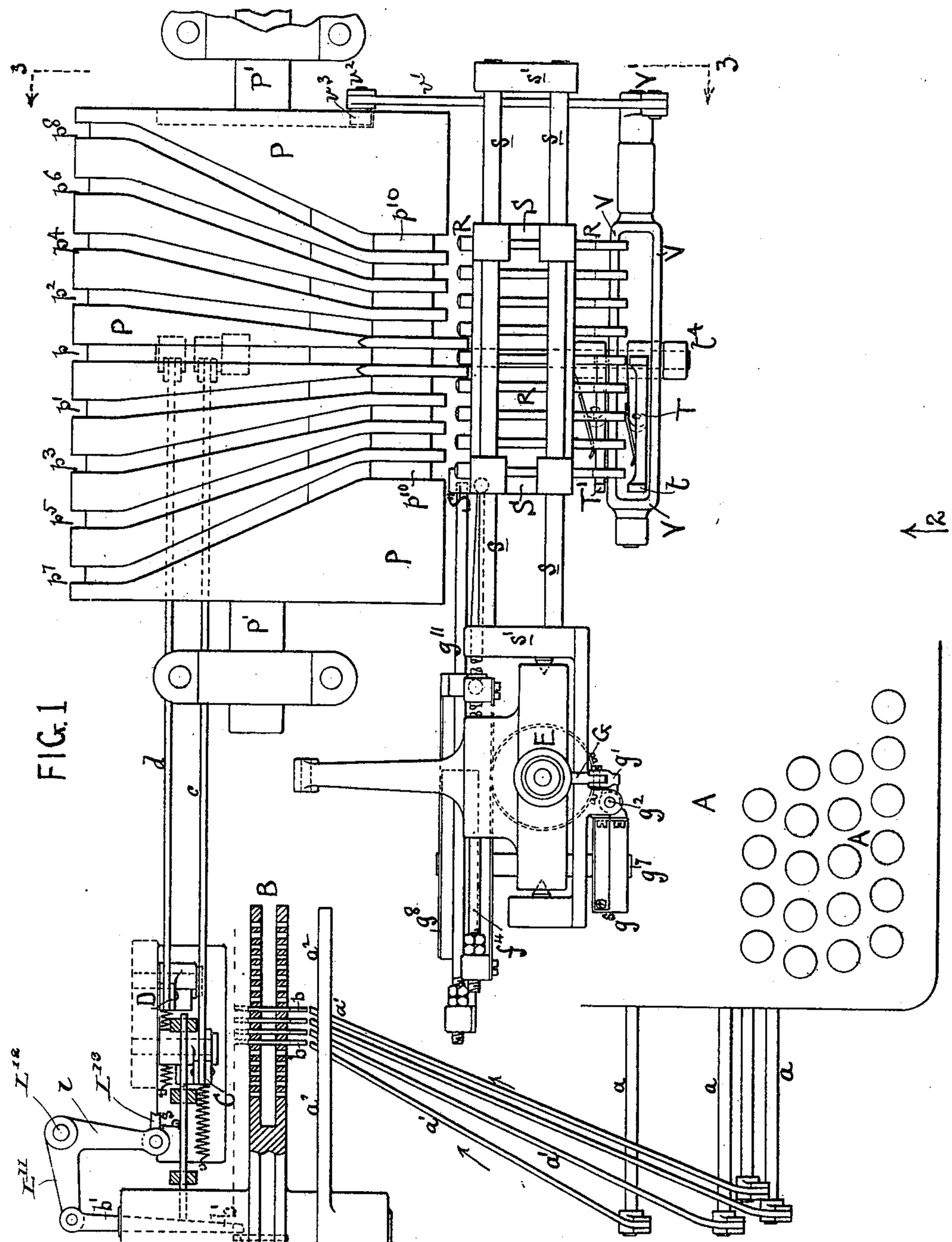

FIG. 1

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FIG. 2.

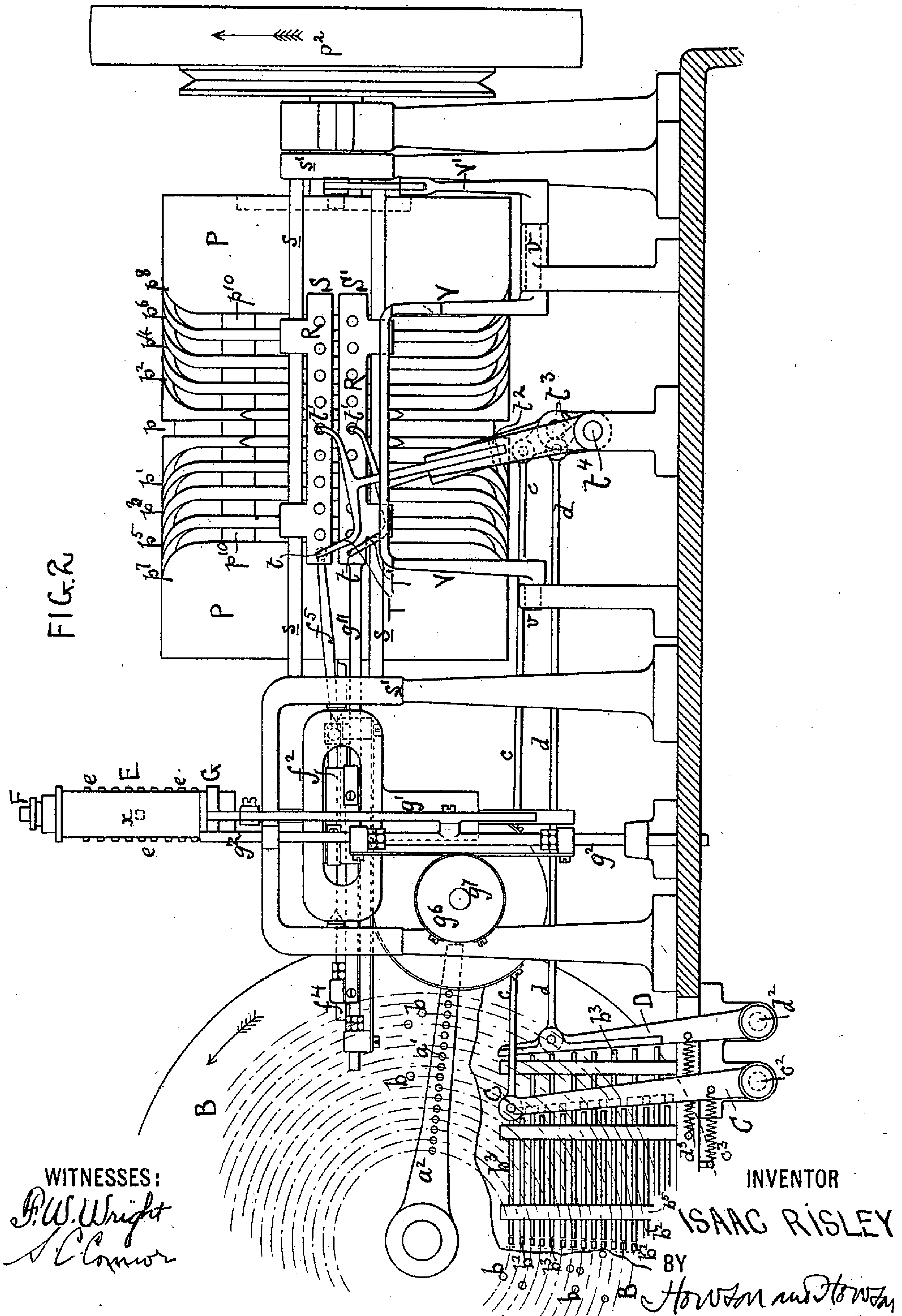

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FIG. 3.

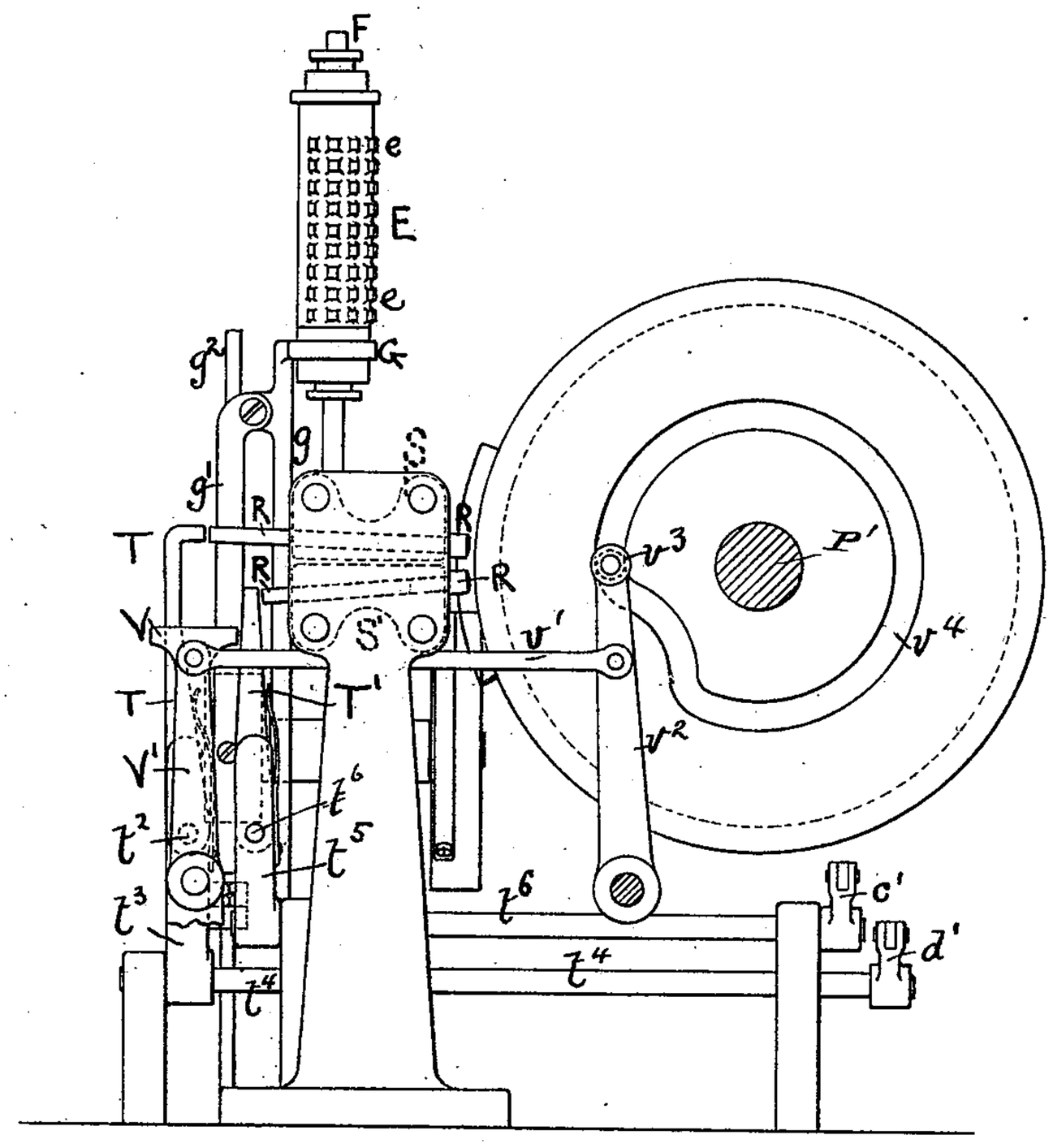

Fig. 8.

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(No Model.) 4 Sheets—Sheet 4.

FIG. 5

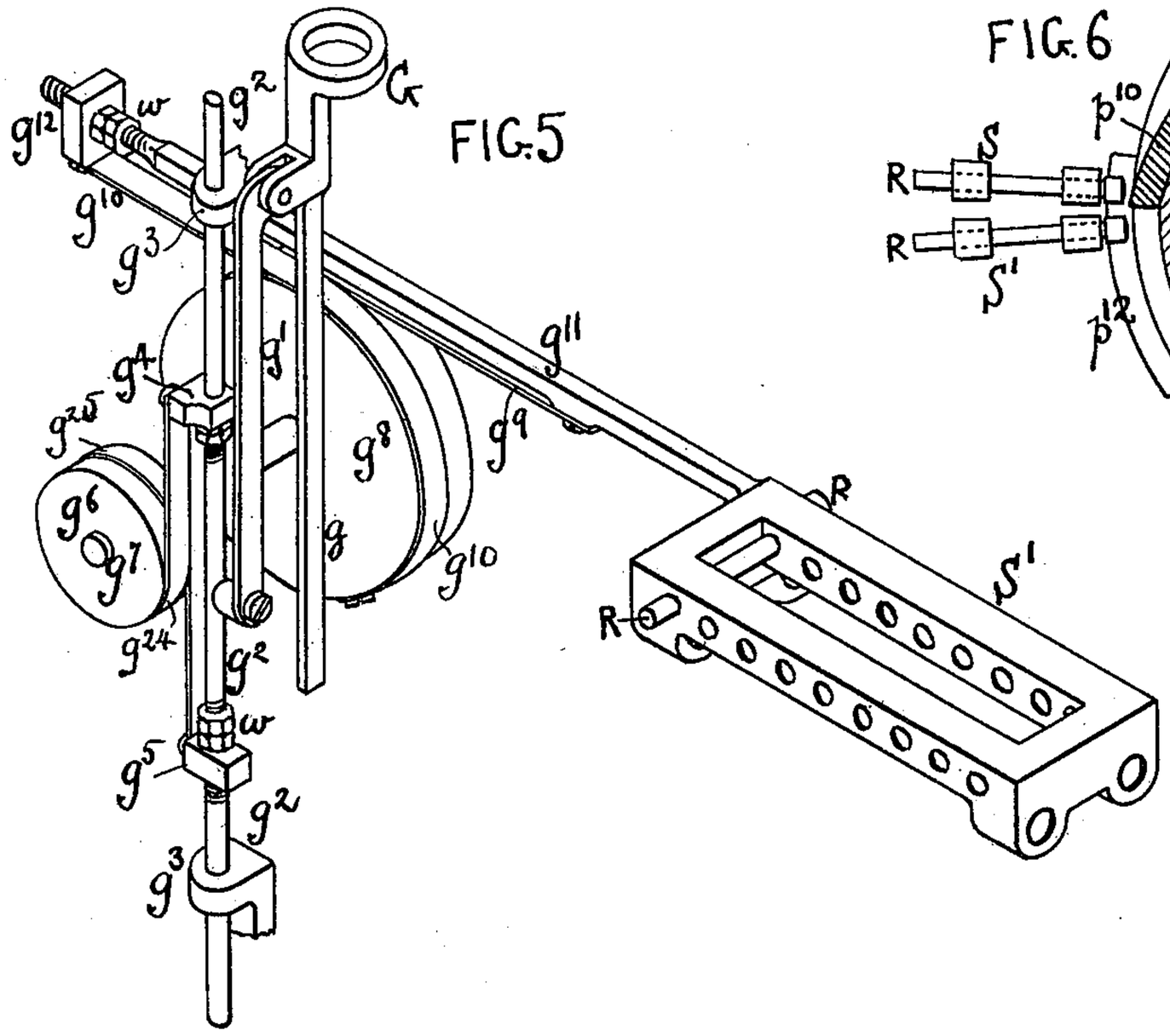


FIG. 6

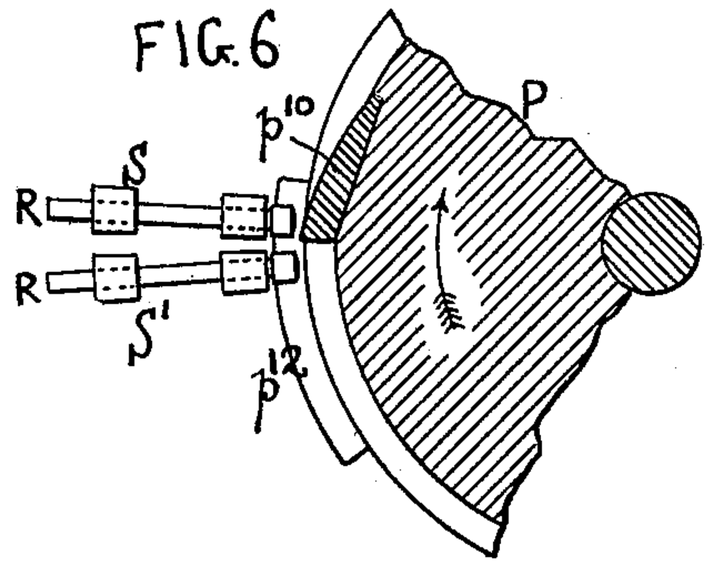


FIG. 4

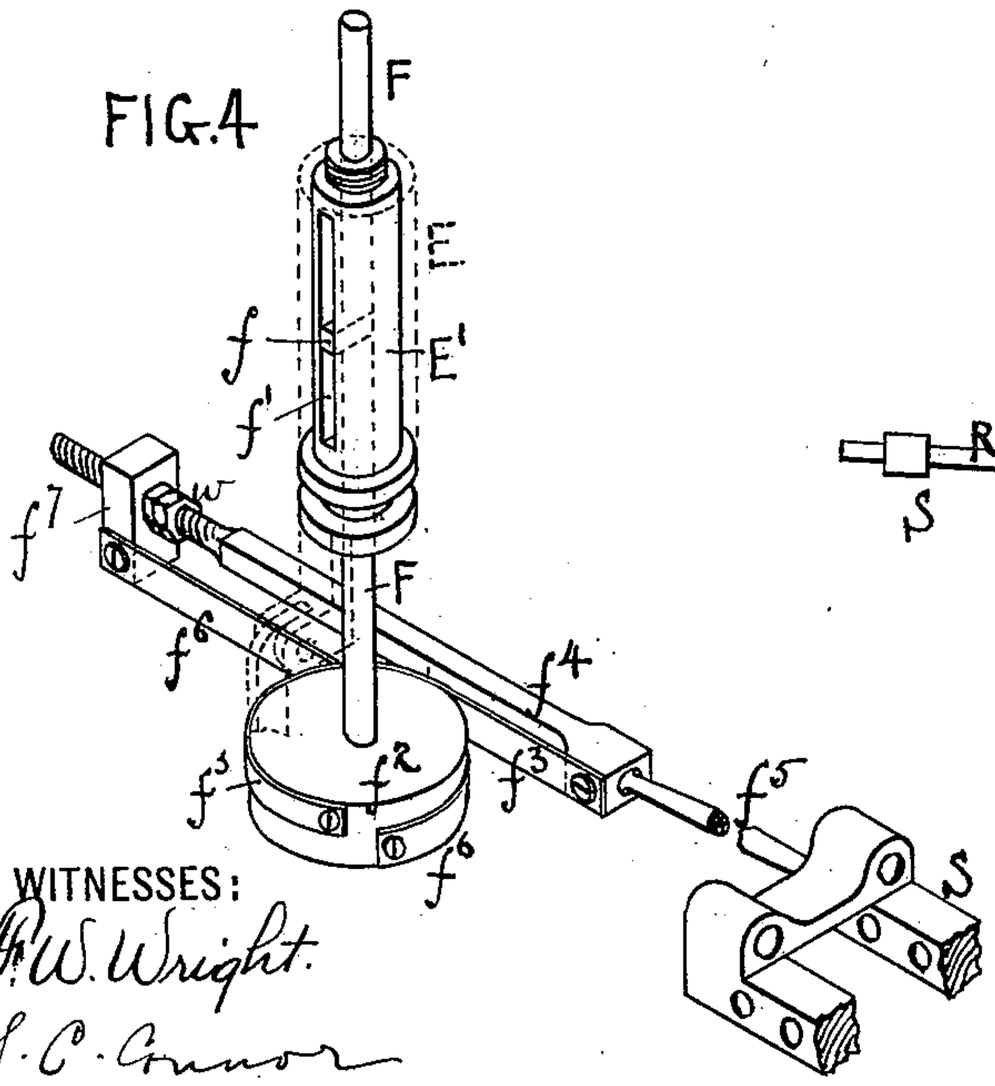
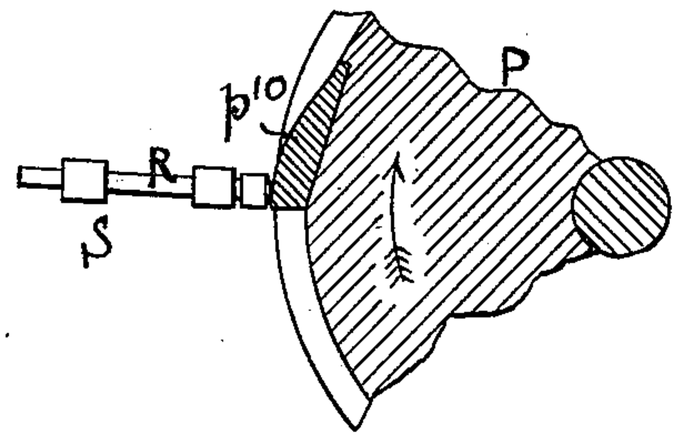


FIG. 7



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UNITED STATES PATENT OFFICE.

ISAAC RISLEY, OF PLEASANTVILLE, NEW JERSEY.

TYPOGRAPHIC MACHINE.

SPECIFICATION forming part of Letters Patent No. 626,097, dated May 30, 1899.

Application filed July 27, 1897. Serial No. 646,121. (No model.)

To all whom it may concern:

Be it known that I, ISAAC RISLEY, a citizen of the United States of America, residing in Pleasantville, Atlantic county, State of New Jersey, have invented Improvements in Typographic Machines, of which the following is a specification.

My invention relates to matrix-making, type-casting, type-setting, type-writing, and other typographic machines in which different parts of a "type-carrier" have to be successively brought to a common point. In the case of a matrix-making machine the type-carrier will be a surface having a series of type or character punches to be impressed into the matrix material. In the case of a type-casting machine the type-carrier will be a surface carrying a series of dies or matrices in which the characters will be cast. In the case of a type-writing machine the type-carrier may be in general respects similar to the type-carrier for a matrix-machine. In the case of a type-setting machine the type-carrier may be a device having a series of chambers any one of which may be brought to a given point to deliver type to the line being set up. The type-carrier may have a flat or curved surface; but in either case the characters are preferably arranged in a series of rows running at right angles to each other, so that if the carrier occupies an upright position one series of rows will run in a vertical direction, while the other series will run in a horizontal direction. The purpose is to so control the carrier as to be able at will to bring any one of the characters to a common point (which may be conveniently termed the "common point of impression") and to return the carrier to its normal central position again.

In Letters Patent granted to myself and V. F. Lake February 28, 1899, No. 620,183, there is shown and described a typographic machine embodying the described principles of operation and in which a type-carrier is located or its characters successively brought to a common point of impression and returned to their normal positions by the aid of power-driven cams and means controlled from a key-board to select the cams to move the type-carrier.

The object of my present invention is to construct a machine of this character with simple and efficient mechanism for operating and controlling the type-carrier to locate any desired character at the common point, as above explained.

In the accompanying drawings I have illustrated my invention as embodied in a machine which is more especially adapted to matrix-making or type-writing, and I have shown the type-carrier as in the form of an upright cylinder carrying types or character-punches in vertical and horizontal rows; but it will be understood, as already explained, that my invention is applicable to other typographic machines than matrix-making machines—as, for instance, type-casting or type-setting—and the type-carrier may be flat or cylindrical and may assume different forms, according to the nature of the machine and the preferences of the constructor.

Figure 1 is a plan view, partly in section, of sufficient of a machine to illustrate my invention. Fig. 2 is a view looking in the direction of the arrow 2, Fig. 1. Fig. 3 is a sectional view on the line 3 3, Fig. 1. Figs. 4 and 5 are perspective views of parts hereinafter more particularly referred to. Figs. 6 and 7 are sectional views illustrating other features of my invention; and Fig. 8 is a view looking in the direction of the arrow 8, Fig. 1.

The principal parts of my present invention comprise the movable type-carrier, slides controlling the movements of the carrier, and a rotary grooved cam, the slides having pins to be projected into the cam-grooves to cause the slides to move the type-carrier to bring the desired characters to the common point and to return the carrier to its normal central position.

As I have said, the type-carrier may vary greatly in construction. I prefer, however, to employ a type-carrier in the form of a cylinder, as shown at E in the accompanying drawings, and so mounted that it can have a longitudinal (in this case vertical) movement and a rotary movement and so that these movements may be in different directions from a normal central position. This type-cylinder has the characters *e* arranged on the cylinder in rows horizontally and vertically with the normal central point indicated by the dotted square *x* in Fig. 2. Any character on the central vertical row can be "located"

or brought to the common point by a vertical movement of the type-cylinder upward or downward and any character on the central horizontal row can be brought to the common point by a horizontal rotary movement to the right or left, while all other characters are located by combined vertical and horizontal movements, as will be readily understood. The cams by which these movements are produced are in the form of cam-grooves p' p^2 p^3, &c., on a single cam-cylinder P, which is mounted upon a rotary power-driven shaft P', shown as provided with a driving-wheel P^2. In front of this cam-grooved cylinder are mounted two slides S and S', which are free to slide horizontally upon guide-rods s s, mounted in standards s' s' on the bed-plate of the machine. Each of these slides S S' is provided with a series of pins R, corresponding in number with the number of grooves p p' p^2 p^3, &c., in the cylinder P, and when the slides are in their normal central positions, as shown in Figs. 1 and 2, the inner ends of these pins R (which I call "selecting-pins") are directly opposite the closely adjacent straight portions of the cam-grooves, so that then any selected pin of either slide may at that point in the revolution of the cam-cylinder be projected to engage with its corresponding cam-groove p' p^2 p^3, &c., and as the cylinder rotates that cam-groove will cause the pin-slide to move horizontally to the right or to the left and to a distance depending on the cam-groove selected. In addition to the cam-grooves I provide what I term a "centralizing-groove," which lies wholly in a plane at right angles to the axis of the cylinder, and in the present instance I have shown it as located at p in the cylinder midway between the two sets of cam-grooves p' p^2 p^3, &c. The series of grooves p' p^3 p^5 p^7 on the left are adapted to move either slide S S' to the left and return it to its normal central position, while the cam-grooves p^2 p^4 p^6 p^8 on the right are adapted to move either slide to the right and return at each revolution of the cam-cylinder. The two series of cam-grooves may act on the pin-slides separately, or either series may act on both slides at once, so that I get all desired movements of the type-carrier from a single cam-cylinder. The bottom of each cam-groove and of the centralizing-groove p is also cammed or provided with an incline at p^{10}, so that as the slide is returned to its normal position the projected pin or pins R will automatically be pushed back out of engagement with the cam-cylinder, Figs. 6 and 7. The two slides are so connected up by any suitable means to the type-carrier E that one slide (say the upper slide S) will impart rotary motion in one direction or the other to the carrier, while the other slide S' will impart vertical motion up or down to the carrier, according to the directions and extents to which the slides S S' are moved by the cam-grooves through the selected pins.

I will now describe one means which may be employed for controlling the movements of the carrier from the slides, premising that I do not wish to confine myself thereto.

In the construction shown the type-carrier is a hollow shell mounted upon a cylinder E', Fig. 4, which turns with but can slide longitudinally on a vertical shaft F, as by means of a key f, moving in a longitudinal slot f' in the cylinder E'. To rotate the shaft F, and consequently the type-carrier, in one direction or the other, there is mounted upon the lower end of this shaft F a drum or pulley f^2, Figs. 2 and 4, to the periphery of which is secured the end of a flexible band f^3, whose opposite end is connected to a horizontal rod f^4, connected by a rod f^5 to the slide S. To the periphery of the same drum or pulley f^2 is connected one end of a flexible band f^6, which is partially coiled around this drum or pulley in the opposite direction from the band f^3. The other end of this band f^6 is connected to a block f^7 on the outer end of the horizontal rod f^4. A similar arrangement of bands and rods may be employed to impart vertical motion to the type-carrier from the slide S'. For this purpose a yoke G, Figs. 2 and 5, engages with the grooved lower end of the cylinder E', on which the type-shell is mounted. The lower end g of this yoke is suitably guided in the frame, so as to be free to have a vertical movement, and the yoke is connected by a rod g' to a rod g^2, which is free to move up and down in suitable guides g^3 in the frame at right angles to the rod f^4. This vertically-moving rod g^2 is connected by blocks g^4 g^5 to a pair of bands g^{24} and g^{25}, passing in opposite directions around and connected to the drum or pulley g^6 on the horizontal shaft g^7, which is mounted to turn in suitable bearings in the frame. On this shaft g^7 is mounted another drum or pulley g^8, which also has connected to it and passing around in opposite directions bands g^9 and g^{10}. The band g^9 is connected to a rod g^{11}, Fig. 5, secured to and moving with the slide S', while the band g^{10} is connected to a block g^{12} on the outer end of the same rod g^{11}. The blocks f^7, g^4, g^5, and g^{12} are provided with adjustable nuts w, as shown in Figs. 4 and 5, in order to accurately locate the positions of the type-carrier.

The selection of the pins R of either slide S S' and their movement into engagement with the corresponding cam-grooves may be obtained by any suitable means, or even in exceptional cases they may be operated by hand. As a rule, however, they will be operated from a keyboard either directly or indirectly. In the present instance I have shown the selecting-pins adapted to be operated by the strikers T and T', Figs. 1, 2, and 3, whose positions are controlled from a keyboard A, Fig. 1, either directly or through the medium of other devices, such as hereinafter referred to. Each striker T T' is double-jointed—that is to say, it is free to move in planes at right angles to each other. The striker T is pivoted at t^2 to an arm t^3 on a horizontal transverse shaft t^4,

Figs. 2 and 3, so that while the striker T may move toward and from the pins R on the pivot t^2 the striker may be moved upon the axis of the shaft t^4 in a plane at right angles to the axes of the pins R and across their outer ends. Similarly the striker T′ is pivoted to an arm t^5 on the transverse shaft t^6 for the same purpose, Fig. 3. By turning the shaft t^4 to the proper extent the operating-finger t of the striker T may be brought opposite or in front of any one of the selecting-pins R of the upper slide S, and in like manner by turning the shaft t^6 the operating-finger t of the striker T′ may be brought opposite any one of the selecting-pins R of the lower slide S′.

In connection with the strikers T and T′, I provide a double universal striker-bar V, pivoted at v to the frame and having an operating-arm V′, connected by a rod v' to an arm v^2, Fig. 3, which has a roller v^3, adapted to run in a cam-groove v^4 in the end of the cylinder P. At the proper moment the cam-groove v^4 will cause a quick movement of the double universal striker-bar V toward the slides S S′, so as to cause the strikers T T′ to push outward the pins R, opposite which either striker may have been brought by the operation of the keys of the keyboard. Each striker T T′ has a second finger t', which when the strikers are in their normal positions (illustrated in Figs. 1 and 2) stand immediately opposite the central pins R of the two slides S S′, assuming that these slides are in their normal central positions, as shown. The purpose is to lock the slides S S′ in their normal central positions at all times when no selections of pins have taken place as the cam-cylinder rotates—that is to say, if no key on the keyboard is pressed while the cam-cylinder is rotating. The universal striker-bar will nevertheless operate the strikers; but the operating-fingers t of the strikers T T′ not being opposite any of the pins none of the latter will be thrown into engagement with a cam-groove, and so no endwise movement of the slides will result. The central pins R of both slides, however, will be projected into the centralizing-groove p by the fingers t' of both strikers. This groove p is provided, as before mentioned, with an incline p^{10} in order to automatically disengage the pins again at the end of each revolution, Fig. 6.

To lock the slides S S′ in their normal central positions until a pin of each slide is pushed into engagement with a cam-groove of the cylinder, I provide short guard-flanges p^{12} on the periphery of the cylinder P to engage with the slides or parts carried thereby. In the present instance I have shown these extra flanges p^{12}, Figs. 1, 2, 3, and 6, as arranged on each side of the central groove p to engage with the heads of the central pins R as those central pins are disengaged from the groove p.

The relation of the fingers t and t' of each striker T T′ to each other and to the pins R is such that when the operating-finger t is brought opposite any one of the pins R the other finger t' will not be in line with any of the pins.

I will now describe the preferred means whereby the strikers T and T′ are moved across the ends of the selecting-pins R and successively brought opposite those pins which are to be brought into engagement with the cam-cylinder. This is done from the keyboard A preferably through the medium of a composing or representation mechanism similar in principles of construction and operation to the representation or composing mechanism of the above-mentioned Letters Patent. The composing or representation mechanism consists of a double disk or wheel B, having pins b frictionally held but movable transversely in the wheels B. This wheel B is revolved intermittently, say, in the direction of the arrow, Fig. 2, and any one of the pins b may be pushed from the position shown in full lines, Fig. 1, to the position shown in Fig. 1 by dotted lines, so as to project at the back instead of the front of the wheel and into the path of any one of a row of pivoted arms b' at the lower part of the back of the wheel. This pushing out of the pins b is effected from the keyboard A whenever a key is depressed by the action of the key on a rocker-shaft a, Fig. 1, pushing out in the direction of its arrow in that figure one of the pusher-rods a', guided at their outer ends in an arm a^2. Only a few of the keys, rock-shafts, pusher-rods, and the pins in the wheel are shown in the drawings.

The arms b' may be pivoted to an elbow-lever L^{11}, Figs. 1 and 8, which turns on a pivot L^{12} and has a vibrating motion imparted to it by any suitable mechanism through a rod L^{13}, so as to carry the free ends of the arms b' out of the path of the projected pins b after each forward intermittent movement of the wheel B and then to return the arms into the paths of succeeding pins b, as shown in Fig. 1. The arms b' are guided in a slotted plate or reed b^5, Fig. 8. The several pivoted arms b' normally bear against corresponding horizontally-movable rods, which are arranged in two sets b^2 and b^3, so that as a pushed-out pin b comes in contact with any arm b' corresponding with the horizontal rod b^2 b^3 the latter will be pushed over toward the cam-cylinder P. At its opposite end this rod b^2 b^3 acts upon a flange upon either the arm C or the arm D. The arm D is connected by a rod d, Figs. 1 and 2, to a crank d' on the end of the shaft t^4, Fig. 3, while the arm C is connected by a rod c to an arm c' on the shaft t^6, before referred to. The arms C and D are respectively pivoted at c^2 and d^2, so that owing to the varying leverage these arms C and D and the connected strikers T′ and T will be moved to varying extents dependent upon which of the rods b^2 b^3 are operated by the pins pushed out in the representation or composing wheel B. Springs c^3 and d^3 tend to keep the arms C and D, and consequently

the strikers and connected parts, in their normal positions. (Shown in Fig. 2.)

I claim as my invention—

1. In a typographic machine, the combination of a rotary cam having cam-grooves with a slide having pins any one of which is adapted to be projected in its corresponding cam-groove and a type-carrier controlled by said slide.

2. In a typographic machine, the combination of a rotary cam having cam-grooves with two slides each having pins capable of being projected into corresponding cam-grooves, a type-carrier and means for connecting the two slides to the carrier, whereby one slide will control the movement of the carrier in one direction and the other slide will control its movement in another direction.

3. In a typographic machine, the combination of a rotary cam having cam-grooves with two slides having pins capable of being projected into corresponding cam-grooves, a type-carrier, means for connecting said slides and carrier, and means for adjusting the connections.

4. In a typographic machine, the combination of a type-carrier, with a rotary cam-cylinder having cam-grooves and means whereby said cam-grooved cylinder controls the position of the carrier, substantially as described.

5. The combination of a rotary cam having cam-grooves with a slide having pins, any one of which is adapted to be projected into its corresponding groove, and means for throwing said projected pin out of its groove on the completion of the revolution of the cam.

6. In a typographic machine, the combination of a rotary cam having a centralizing-groove and cam-grooves with a type-carrier and a controlling-slide having pins any one of which is adapted to be projected into a corresponding groove in the cam-cylinder, each of the said cam-grooves being so formed as to move the slide and carrier the distance required by the selected pin for said groove and to return the carrier to its normal position.

7. In a typographic machine, the combination of a rotary cam having a centralizing-groove and cam-grooves with two slides each having pins capable of being projected into corresponding grooves, a type-carrier connected to both slides, and inclines on the cam for automatically returning the projected pins from their corresponding grooves on the completion of the revolution of said cam.

8. In a typographic machine, the combination of a rotary cam having cam-grooves with slides having pins capable of being projected into corresponding grooves, a type-carrier controlled by the slides, means for automatically returning the projected pins from their corresponding grooves on the completion of the revolution of said cam, and means upon said rotating cam for locking the slides in their normal positions after the projected pins have been returned from the grooves and until other pins have been projected.

9. The combination of the rotary cam having cam-grooves with slides carrying pins adapted to be projected into and returned from said groove, and means for normally holding said slides during the time of returning said projected pins and of projecting other pins.

10. The combination of a rotary cam having a centralizing-groove and cam-grooves, with a slide carrying pins adapted to be projected into and returned from their corresponding grooves, and means for normally projecting the centralizing-pins into the centralizing-groove when no cam-groove is selected.

11. The combination of a rotary cam having a centralizing-groove and cam-grooves with a slide carrying pins adapted to be projected into and returned from their corresponding grooves, means for normally holding said slide during the return of the projected pins and the projecting of another pin, and means for normally projecting the centralizing-pin into its groove when no cam-groove is selected.

12. In a typographic machine, the combination of a keyboard, a representation device and a type-carrier with a rotary cam having cam-grooves, a slide having pins, means controlled by the representation device for projecting the pins into corresponding cam-grooves, and means controlled by said cam-grooves and pins for positioning the carrier.

13. In a typographic machine, a type-carrier-locating device consisting of pin-slides and a cam-cylinder having two series of cam-grooves thereon, said two series of grooves being capable of being employed separately or combined on the slides for the location of the carrier.

14. In a typographic machine, the combination of a rotary cam having cam-grooves with a type-carrier, and a slide controlling the type-carrier, the said slide having plungers adapted to be projected into the cam-grooves and an incline on the cam for automatically returning the projected plunger on the completion of the revolution of the cam.

15. In a typographic machine, the combination of a cam having cam-grooves, with a type-carrier and a slide controlling the type-carrier, the said slide having plungers, a striker adapted to be moved across in front of different plungers and means for vibrating the strikers to project the plungers into the cam-grooves.

16. In a typographic machine, the combination of a cam having cam-grooves with a type-carrier, a slide controlling the type-carrier, the said slide having plungers and a pair of strikers adapted to be moved from their normal central positions in front of different plungers to project the latter into the grooves of the cam.

17. In a typographic machine, the combina-

tion of a type-carrier, two slides controlling the movement of the type-carrier in two different directions, with a cam having cam-grooves, plungers in the slides and two pairs of strikers adapted to be moved from their normal central positions opposite different plungers and means for actuating the strikers to project the plungers.

18. In a typographic machine, the combination of a type-carrier and slides controlling the movement of the type-carrier, with a cam having cam-grooves, plungers in the slides, strikers adapted to be moved opposite the different plungers, means for actuating the strikers to project the plungers and a keyboard controlling the positions of the strikers opposite the different plungers.

19. In a typographic machine, the combination of a preliminary representation device, a type-carrier, slides controlling the positions of the carrier and plungers in the slides with a cam having cam-grooves, strikers adapted to be brought opposite different plungers under the dictation of the representation device, and means for actuating the strikers to project the plungers.

In testimony whereof I have signed my name to this specification in the presence of two subscribing witnesses.

ISAAC RISLEY.

Witnesses:
LEWIS H. BARRETT,
WM. G. JOHNSTON.