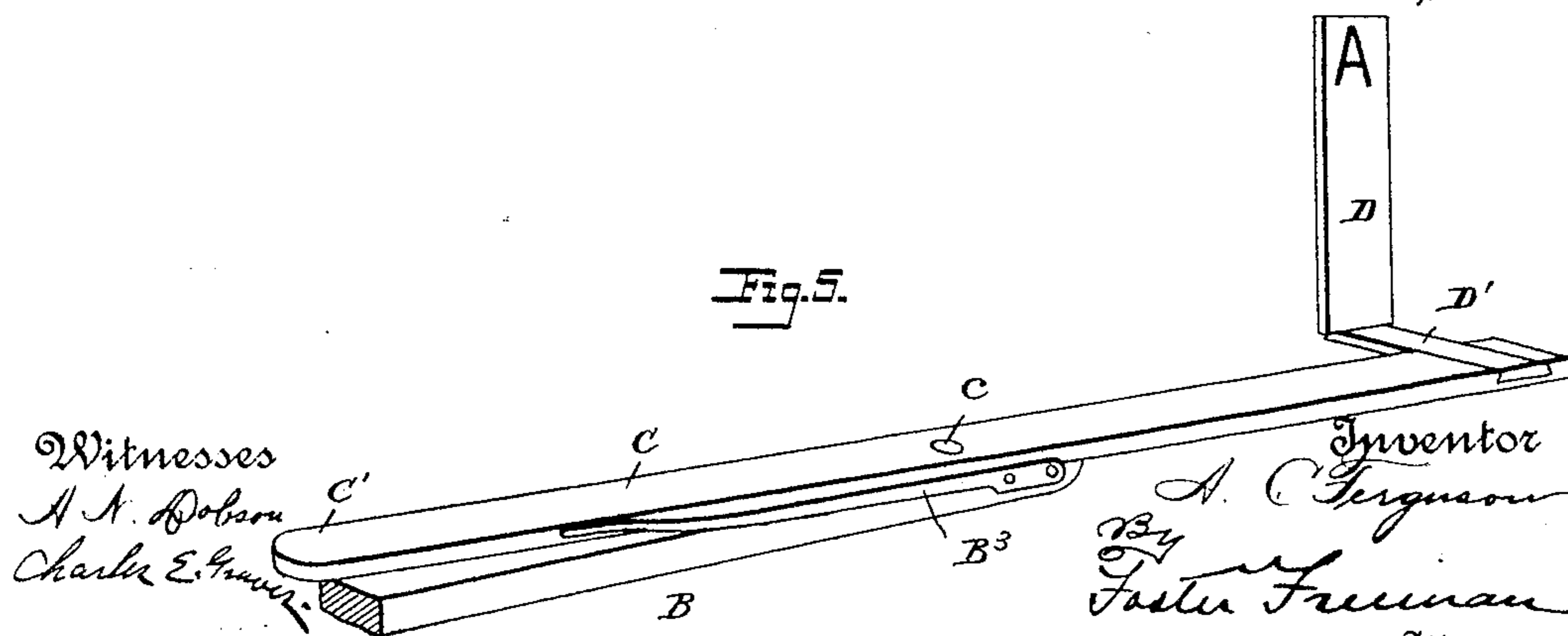
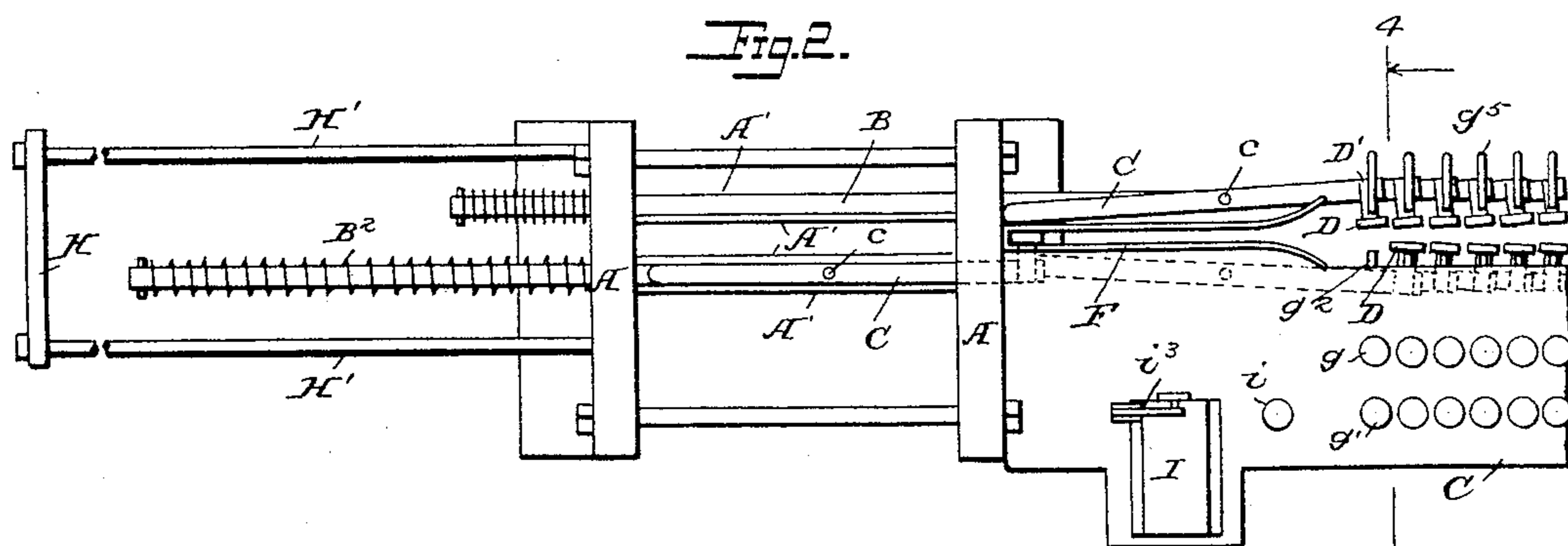


2 Sheets—Sheet 1.

No. 497,914.

Patented May 23, 1893.



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(No Model.)

2 Sheets—Sheet 2.

A. C. FERGUSON.
PHOTOTYPE MACHINE.

No. 497,914.

Patented May 23, 1893.

Fig. 3.

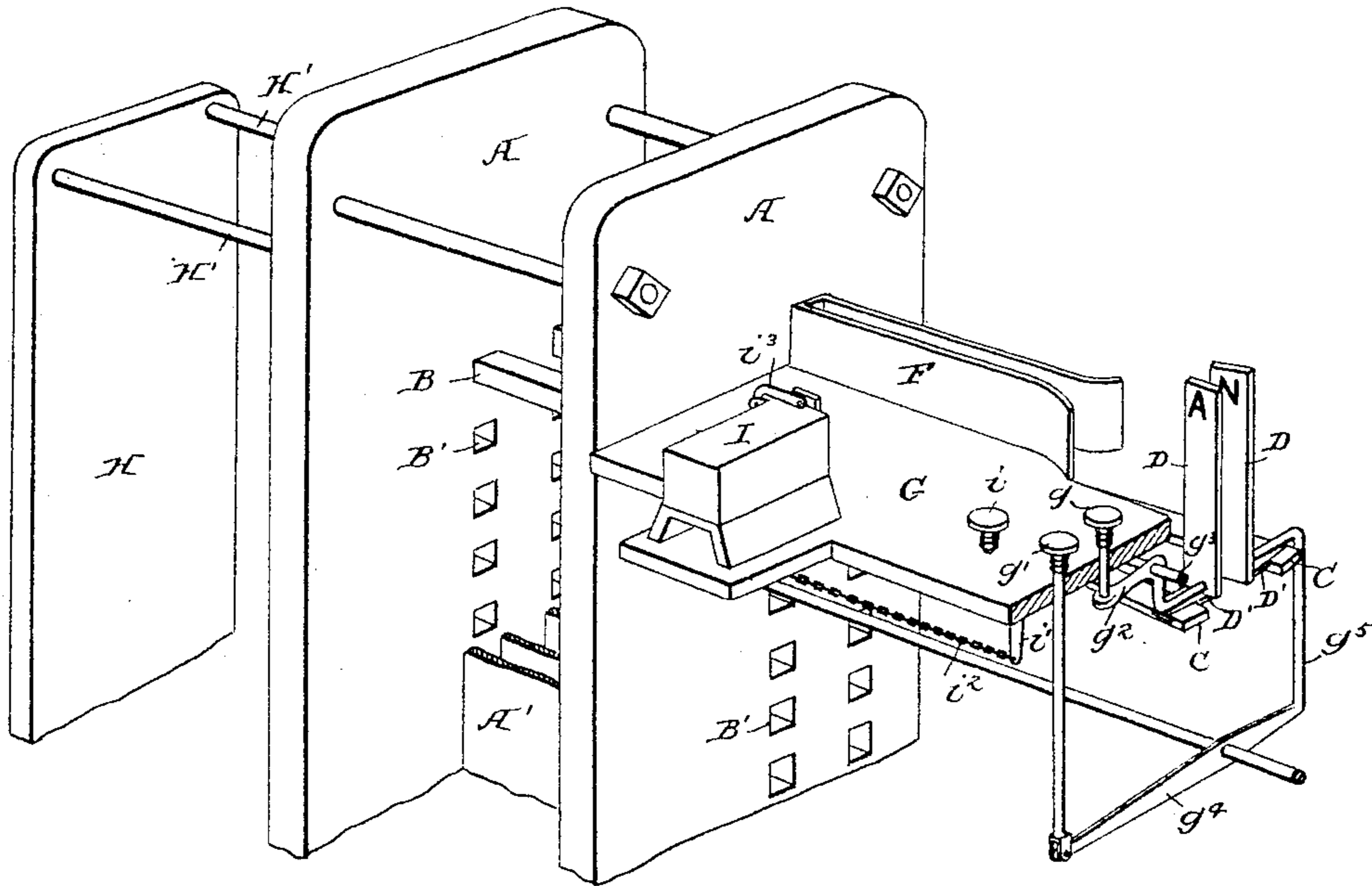
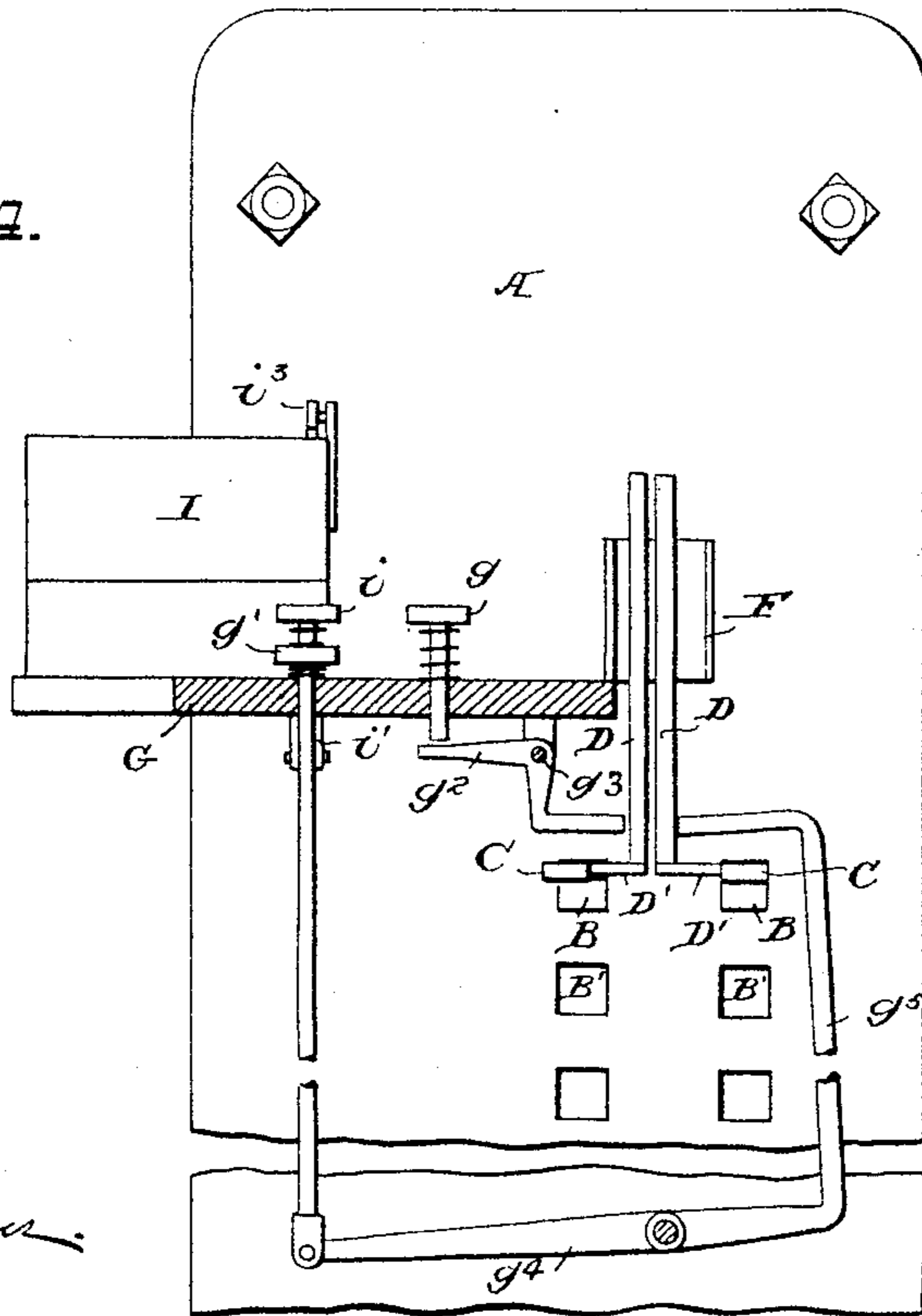


Fig. 4.



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UNITED STATES PATENT OFFICE.

ARTHUR C. FERGUSON, OF SARATOGA SPRINGS, NEW YORK.

PHOTOTYPE-MACHINE.

SPECIFICATION forming part of Letters Patent No. 497,914, dated May 23, 1893.

Application filed September 22, 1892. Serial No. 446,592. (No model.) Patented in Canada October 25, 1892, No. 40,803.

To all whom it may concern:

Be it known that I, ARTHUR C. FERGUSON, a citizen of the United States, residing at Saratoga Springs, Saratoga county, New York, have invented certain new and useful Improvements in Phototype-Machines, (for which I have obtained Canadian Letters Patent No. 40,803, dated October 25, 1892,) of which the following is a specification.

My invention has for its object to provide means whereby printing surfaces can be produced through the aid of certain characters which can be arranged in any desired order, and from which photographs can be taken, and which photographs can be transferred or transformed into the printing surface, and I have designated this class of machinery as the phototype machine.

My invention consists in a machine in which the various characters can be assembled in a line, and the line properly supported in position while a photograph is being taken of the line when the characters can be quickly restored to their normal positions, and by repetition of these operations, a proper photographic plate produced from which by any of the well known processes, a printing surface can be made, and I carry out these various steps thus generally indicated by means of devices constructed, arranged, and having the mode of operation substantially such as are herein more particularly set forth.

Referring to the accompanying drawings in which I have shown one embodiment of my invention, Figure 1, is a side elevation of the operating machine. Fig. 2, is a plan view of Fig. 1. Fig. 3, is a perspective view of the machine, the end being cut away through the key board to better show the arrangement of the mechanism, and some of the bars being omitted for the sake of clearness, the partitions A', being also broken away for the sake of clearness. Fig. 4, is an enlarged transverse sectional view taken at the point of section of the key board in Fig. 3. Fig. 5, is an enlarged perspective view of one of the type-carrying bars and connections.

The machine comprises a body or frame A

which supports the operative parts, and while this may be variously constructed, I have shown it in the form of a rectangular upright frame. Mounted in this frame are the horizontal bars B, and these are arranged to slide in openings B' in the sides of the frame. There are as many of these horizontal bars as there are characters to be used in forming the line of characters which is to be photographed, and these are preferably arranged in two vertical parallel rows.

Each bar B is provided on one end with a suitable device as a spring B², which normally tends to draw the bar to one side of the main frame. Each bar carries on its other end a pivoted bar C, which is shown as connected to the bar B near its center by a pivot c. This bar is under stress, so that its normal position is slightly at an angle to the bar B, and I have shown a spring B³ mounted on the bar B, and pressing against the edge of the swinging bar C to hold it in the desired position. As the bars B are arranged in the frame, the spring B² is under pressure, the bar being locked in its extended position by the end of the bar C impinging upon the side of the frame adjacent to the slot or opening B', the spring B³ holding the bar in this position, until released in a manner hereinafter set forth.

Each bar C is provided with an upwardly extending arm or projection D carrying the characters which are to be produced on the negative, and subsequently on the printing plate. I have shown this extension in the form of a right angled bar preferably of metal, and having the character near its top, while its lower portion D' is fitted to slide in the end of the bar C, it being shown as dovetailed, and sliding under frictional contact, the essential feature being that it shall be held in its normal position with sufficient firmness to move the swinging bar C against the pressure of the spring B³, but to permit of the arm being moved in its support when desired. The swinging bars C are of various lengths, and are pivoted to the sliding bars B at different distances from the frame and the upright arms are also of different lengths so that when

the bars are in their normal position, as best shown in Fig. 1, the characters on the respective bars are in a horizontal line. As before stated there are two rows or series of these sliding bars carrying pivoted bars supporting the arms, and these rows are arranged at each side of a central passage way so that when they are at rest, the arms carrying the characters are at a slight angle to the median line of this passage way, Fig. 2. Arranged in the upper part of this passage way, and below the line of characters, is a chute F, which is shown as composed of parallel plates preferably having a flaring mouth, and this forms what may be termed a line channel for the character carrying arms, and in which the characters requisite to form a line of printed matter can be arranged for the purpose of photographing.

Mounted on the frame A and extending in proper relation to the character carrying arms is a key board G, provided with two sets or rows of keys g, g' , corresponding with the number of bars, and arranged to operate the pivoted bars to allow the character carrying arms to be brought into proper relation in the line channel. Connected with these keys are suitable levers, by means of which each character carrying arm can be operated. Thus in Figs. 3 and 4, I have shown the lever g^2 , it being mounted on a rod or support g^3 , which may be common to half of the levers, and as extending, so that it normally impinges upon the character carrying arm D, while the key g' is connected by means of the levers g^4, g^5 to impinge upon the opposite row of character carrying arms.

Mounted on suitable supports H' is a universal restoring bar H, by means of which all the bars B, and their adjuncts can be restored to their normal position, in order to distribute the line of characters from the line channel. This bar can be operated in any suitable way, it being simply shown as sliding on its supports and arranged to engage any or all of the horizontal bars which may be extended.

The operation of the device as so far described will be readily understood and in order to arrange or set up a proper line of characters in the channel, it is only necessary to strike the proper keys on the keyboard in regular succession, when the characters will be automatically assembled in the line channel. Thus for instance if the character in the channel is to be an "A," the operator will strike the key so designated, and the lever connected to said key will force the character carrying arm inward toward the central channel, as seen in Fig. 4, where the key g' is depressed, and its corresponding character carrying arm D' is forced inward toward its opposite character carrying arm. This turns the lever C on its pivot, so that its end C' which has rested against the frame adjacent to the slot B', will be brought in line with the

horizontal sliding bar B, thereby unlocking said bar, and allowing the spring B³, or its equivalent to retract the sliding bar B, and the upwardly extending arm D will pass into the line channel, and assume its proper and normal position. If, then, it is desired to bring the character H in position, its proper key is struck as before, and the corresponding bar C is rocked on its pivot to unlock the sliding bar B, and by this means, the upright character carrying arm is forced outward beyond the line of the corresponding character carrying arms into the channel way, and it is brought into proper position in the line channel, closely abutting against the character carrying arm A, by means of the spring. If this completes the word, a proper key is struck to allow the arm S forming the proper space bar to be next brought into position in the line channel, and so on throughout until the line channel is full.

It will be understood that in order to bring any character in proper succession in the line channel, it is only necessary to strike the corresponding key which will rock the lever C, releasing the bar B, and throw the character carrying arm into the space between the two rows, and allow it to pass rearwardly into the channel under tension of a spring. This spring causes the characters to bear closely upon each other, and to be held in proper relation, it being understood of course that each character carrying arm is of a proper width to correspond with a particular letter carried thereby. The sides of the line channel maintain these character carrying arms in proper alignment, and prevent them from sliding one by another, and when the line is complete, the photograph of this line can be taken in any desired way.

I have shown herewith a simple camera I, which may be of the automatic kind, similar to the well known Kodak in which when the shutter is moved, and the exposure made, the sensitive film is automatically moved forward one step. This camera can be operated by a key or otherwise, and I have shown arranged on the keyboard, a key i , which is connected by any suitable means with the shutter of the camera, so that by simply pressing the key, the photograph of the assembled line of characters can be instantly made and the camera set ready to receive the next line.

I have shown a bell crank lever i' , connected by any connections as chains i^2 , with the lever i^3 , mounted on the camera and arranged to trip the shutter when the key i , is depressed, the shutter operating mechanism not being specifically shown as that can be of any of the well known constructions known in cameras now in the market. When this has been done in order to distribute the characters in the line channel, it is only necessary to move the bar H toward the frame, when all the sliding bars B will be forced forward until their respective pivoted bars C pass be-

yond the openings B' in the frame, when the spring B³ will tilt or rock the bar C, so that its end C' will pass beyond the slot, and form a lock to prevent retraction by the spring, and at the same time the character carrying arm D will be thrown into its proper place on either side of the central channel E, and the machine is ready for operation to set up or arrange the next line of characters.

10 In order to prevent the pivoted lever C from moving on its pivot with the movement of the horizontal sliding bar B, especially where the said bars have a long distance to move, and there is danger of the ends C' of said bars 15 impinging upon the rear slot B' in the frame, I arrange a partition or plate A' adjacent to the moving bars, which will serve as an additional guide thereto, or if preferred, the whole frame A may be solid with the slots B' 20 extending through from side to side.

From the above it will be seen that by simply pressing the proper keys, the desired characters will be automatically arranged in the type channel to form an ordinary line of type, 25 so that on exposure of the line of characters to the photographic apparatus, a proper negative of each line can be taken thereon, and as soon as this is done, all the characters can be distributed to set up another succeeding 30 line, and this being photographed, and the operation repeated until a sufficient quantity of matter is properly photographed on the film. This film is then treated in the well known way, and transferred to a printing sur- 35 face or a printing surface is cast or otherwise formed therefrom.

What I claim is—

1. The combination with a series of independent character carrying arms; of means 40 for arranging said characters in series, to form a line of matter to be printed, a camera for photographing said lines in succession, and means for distributing said lines of characters in succession; substantially as described.

45 2. The combination with a supporting frame, of horizontal sliding bars, the pivoted bars mounted thereon, character carrying arms supported on said pivoted bars, and springs mounted on the sliding bars and bearing on 50 the pivoted bars substantially as described.

3. The combination with the frame, of the horizontal sliding bars having a spring at one end, and carrying at the other end a pivoted bar supporting a character carrying arm, sub- 55 stantially as described.

4. The combination with the frame, of the sliding bars having a spring at one end, of the pivoted bars mounted thereon and supporting a character carrying arm, and a spring 60 mounted on the bars for deflecting the pivoted bars to form a lock for holding the horizontal sliding bars in position, substantially as described.

5. The combination with the frame, of the 65 horizontal sliding bars, having a spring at one end the pivoted bars mounted thereon, the

character carrying arms supported on said pivoted bars, the keyboard, the keys, and connections between the keys to operate the character carrying arms, substantially as de- 70 scribed.

6. The combination with the frame of two series or lines of sliding bars arranged parallel to each other and having springs at one end, each bar being provided with a pivoted 75 bar with a character-carrying arm mounted on the pivoted bar, the pivoted bars of each set being arranged in opposite relation to each other so that the pivoted bars will normally move in opposite directions, a key board, two 80 sets of keys, and connections between each set of keys and each series of sliding bars, whereby on depressing one key the corresponding arm will be forced inward between the series of arms to allow the arm to travel 85 past the adjacent series, substantially as described.

7. The combination with the frame of two sets of horizontal sliding bars, each provided with a spring, a pivoted locking bar attached 90 to each horizontal sliding bar, a character carrying arm mounted on each pivoted bar, a line channel centrally arranged between the sets of character carrying arms, and keys and connections for releasing the locking bars, 95 and allowing the character carrying arms to be assembled in succession in the line channel, substantially as described.

8. The combination with the frame, of a line channel supported thereon, a series of 100 independent character carrying arms adapted to be arranged in succession in said line channel a camera arranged to photograph the line of assembled characters, a key board, connections between the keys and the char- 105 acter-carrying arms and connections between one of the keys and the camera, substantially as described.

9. The combination with the frame, of a series of horizontally sliding bars, each bar 110 being provided with a pivoted bar mounted thereon and having a character-carrying arm, a line channel, keys controlling said character-carrying arms, means for moving the arms, and arranging them in the line channel in ac- 115 cordance with the key struck, and means for restoring the character-carrying arms to their normal position, substantially as described.

10. The combination with the supporting frame, of a horizontal bar sliding in openings 120 in said frame, each bar being provided with a bar pivotally mounted thereon, a spring mounted on the sliding bar and bearing on the pivoted bar, a spring mounted on the end of the sliding bar, the arrangement being such 125 that the pivoted bar normally bears against the face of the supporting frame, forming a stop for the sliding bar, substantially as described.

11. The combination with the supporting 130 frame, of a series of horizontally sliding bars moving in openings in said frame, each bar

being provided with the bar pivotally mounted thereon, and supporting a character-carrying arm, a spring mounted on the sliding bar and bearing on the pivoted bar, a spring
5 mounted on the end of the sliding bar tending to move said bar, keys and connections between the keys and the pivoted bars, whereby, in a normal position, the pivoted bars act as stops for the sliding bars and when the
10 pivoted bars are moved by the keys the spring

will move the sliding bars, substantially as described.

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

ARTHUR C. FERGUSON.

Witnesses:

JNO. G. HINKEL,

A. E. T. HANSMANN.