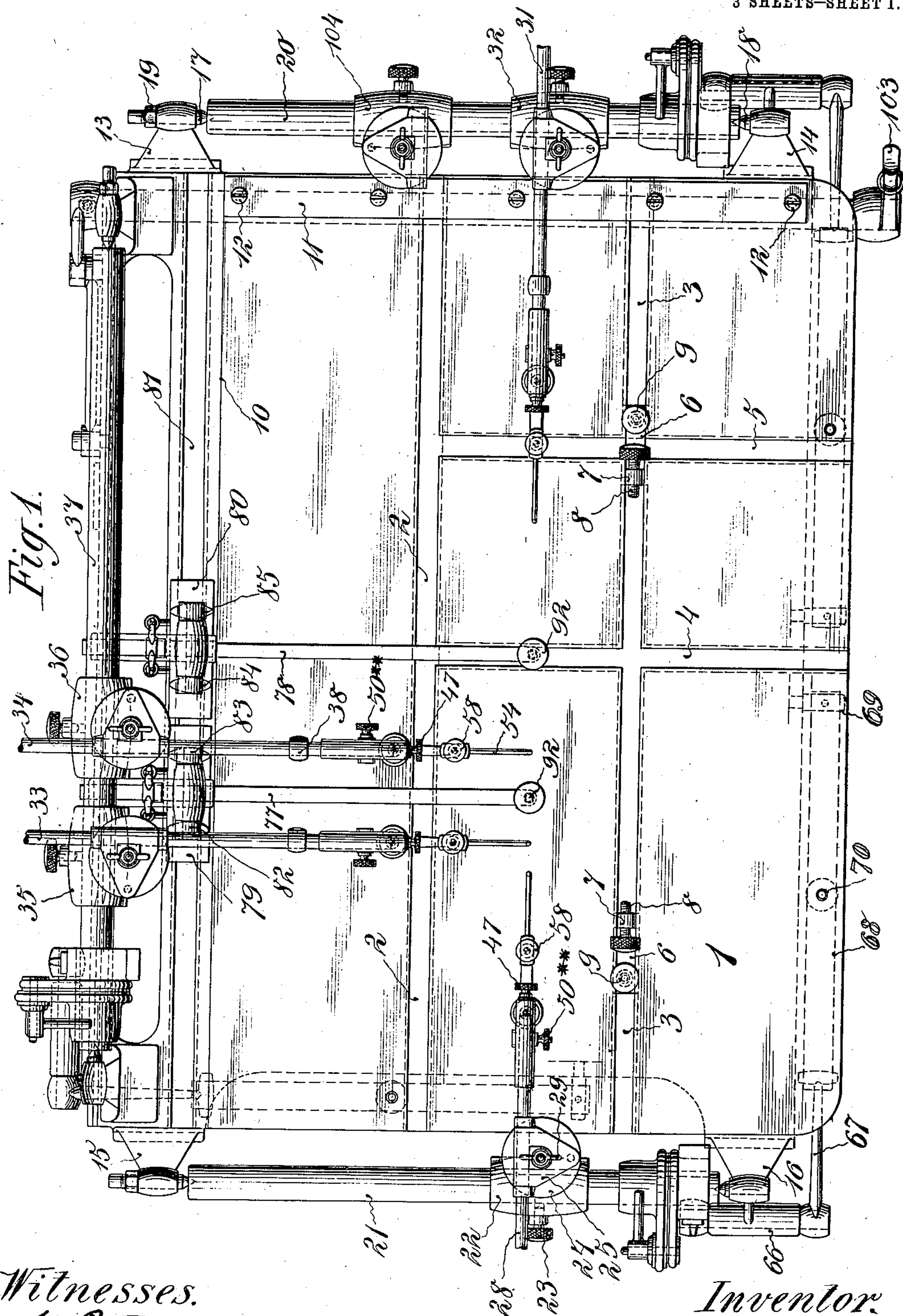


V. ROYLE.
 APPARATUS FOR REGISTERING PRINTING PLATES.
 APPLICATION FILED FEB. 4, 1908.

983,648.

Patented Feb. 7, 1911.

3 SHEETS—SHEET 1.



Witnesses.
M. G. Gubler
J. George Barry

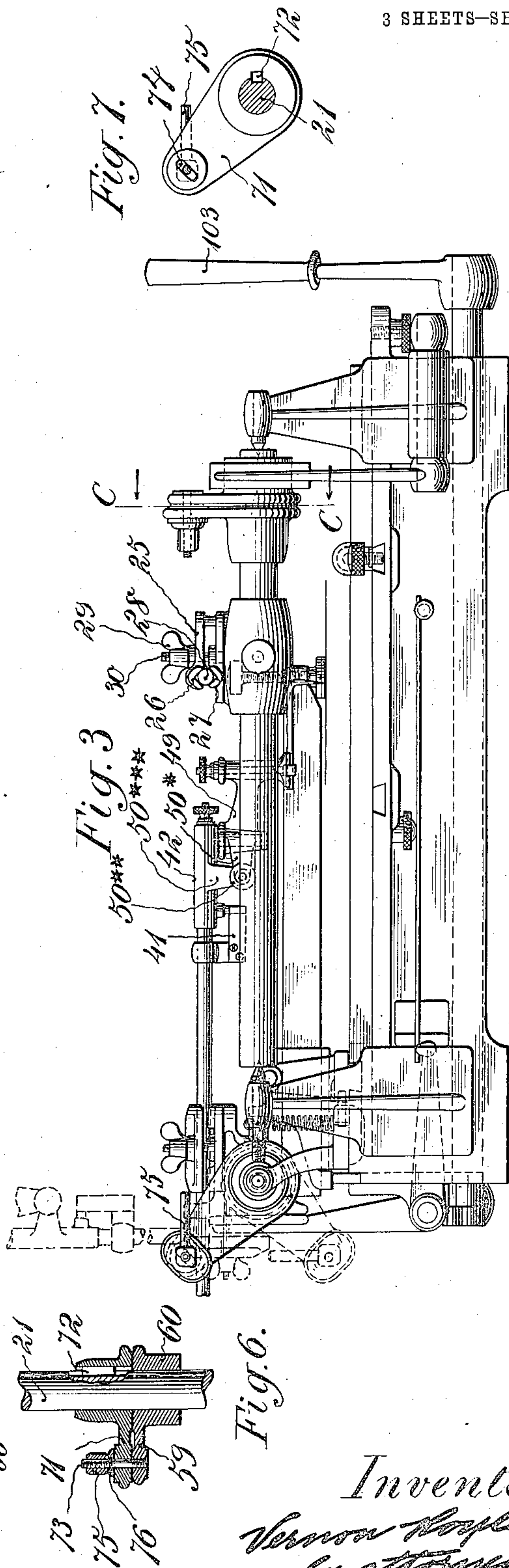
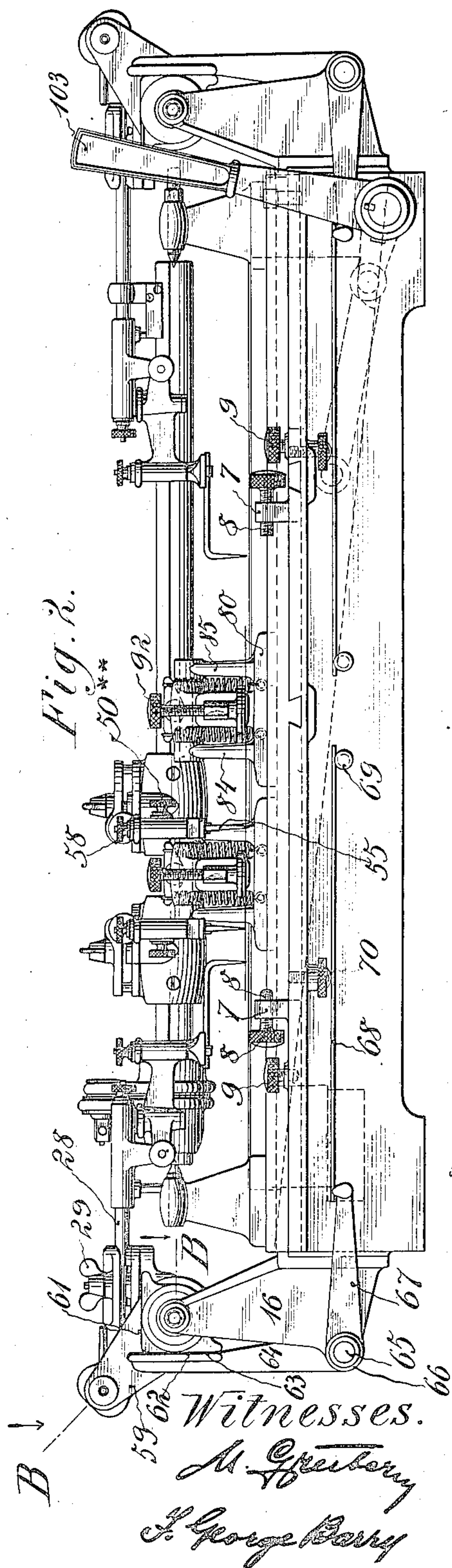
Inventor.
Vernon Royle
 by attorney
Brown & Seward

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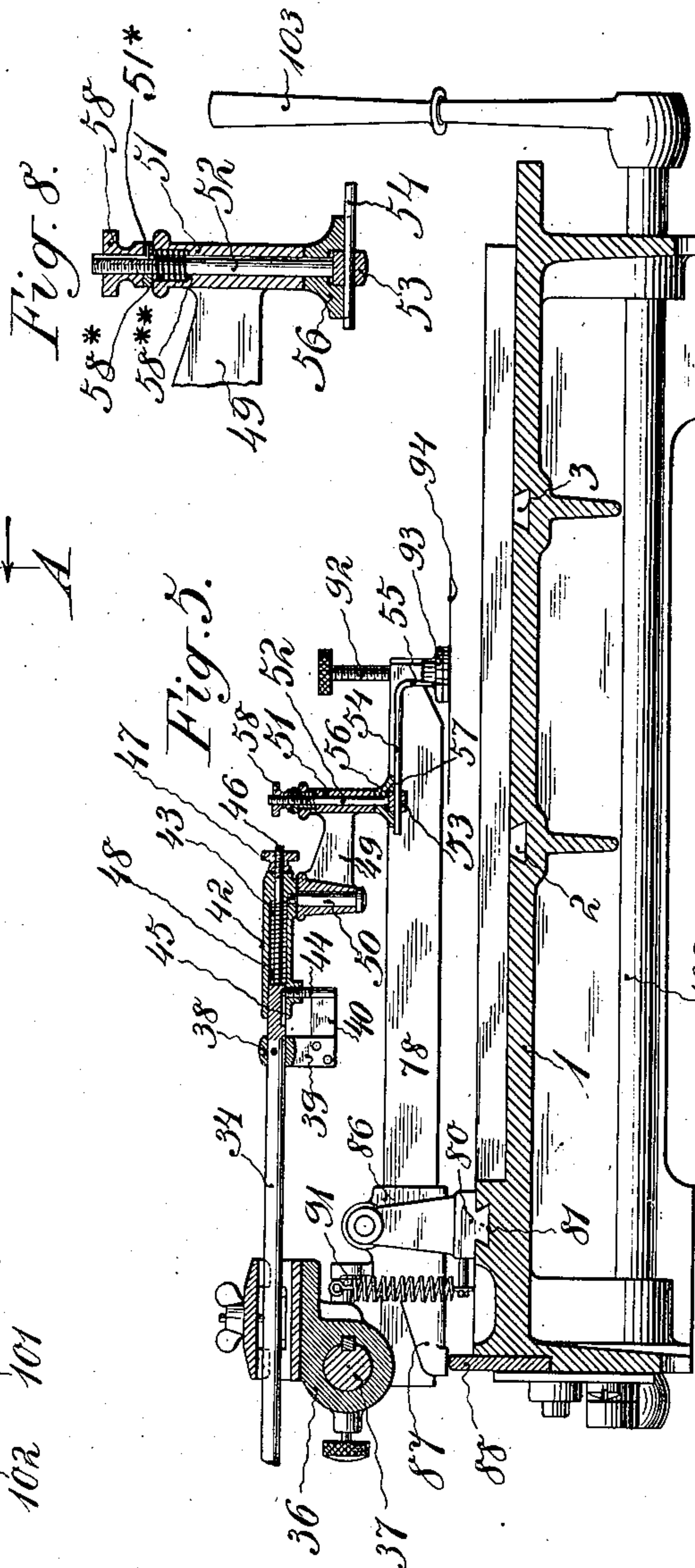
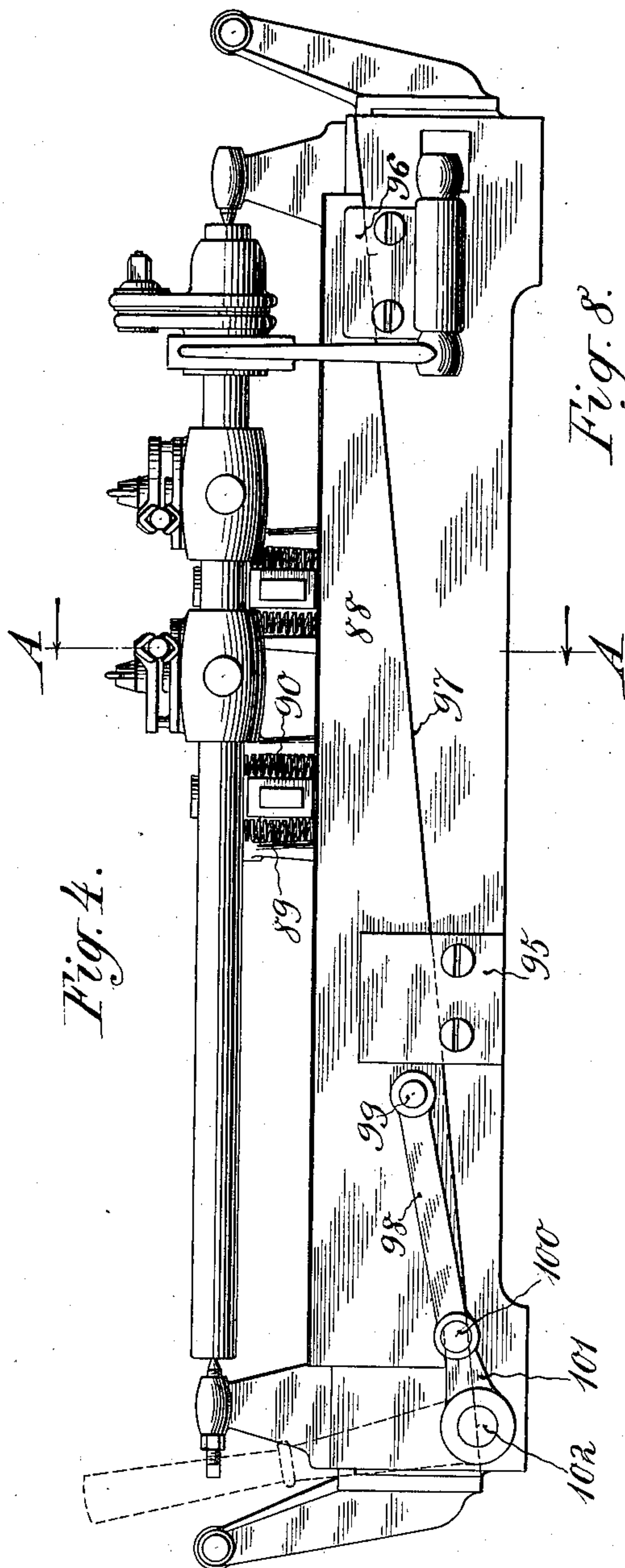
Inventor.
 Vernon Royle
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3 SHEETS—SHEET 3.



Witnesses.
M. G. Kober
F. George Barry.

Inventor.
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UNITED STATES PATENT OFFICE.

VERNON ROYLE, OF PATERSON, NEW JERSEY.

APPARATUS FOR REGISTERING PRINTING-PLATES.

983,648.

Specification of Letters Patent.

Patented Feb. 7, 1911.

Application filed February 4, 1908. Serial No. 414,176.

To all whom it may concern:

Be it known that I, VERNON ROYLE, a citizen of the United States, and a resident of Paterson, in the county of Passaic and State of New Jersey, have invented a new and useful Apparatus for Registering Printing-Plates, of which the following is a specification.

My invention relates to apparatus for registering printing plates, with the object in view of providing efficient means for registering the plates on their blocks or mounts and for registering inserts in the plates for example for changing a portion of a label printing plate without disturbing other portions of the plate.

A practical embodiment of my invention is represented in the accompanying drawings, in which—
Figure 1 represents the apparatus in top plan, Fig. 2 represents the same in front elevation, Fig. 3 represents the same in end elevation, Fig. 4 represents the same in rear elevation, Fig. 5 represents a vertical section in the plane of the line A—A of Fig. 4, Fig. 6 is a section in detail in the plane of the line B—B of Fig. 2, Fig. 7 is a section in detail in the plane of the line C—C of Fig. 3, and Fig. 8 is an enlarged view in detail of one of the pointer supporting socket pieces.

The table for supporting the blocks on which the printing plates are mounted is denoted by 1. It is conveniently of a general rectangular shape and is made sufficiently thick to withstand the blows of a tack hammer in tacking plates or pieces of plates in position without undue vibration.

The table is provided on its face with undercut grooves, in the present instance with two undercut grooves 2 and 3 running lengthwise on the table in its face and with two undercut grooves 4 and 5 running at right angles to the grooves 2 and 3 partially across the face of the table. These grooves 2 to 5, inclusive, are for the reception of block retaining dogs. Each of these dogs consists of a base 6 beveled to fit the undercut grooves 2 to 5 inclusive, a lug 7 uprising from the base for the reception of a horizontally arranged adjusting screw 8 and a screw 9 extending downwardly through the base 6 and into contact with the bottom of the groove for holding the dog in position in proximity to the edge of the block.

Along one side of the table there is a

straight edge 10 raised above the surface of the table and at right angles to the straight edge 10 there is a removable straight edge 11 fastened to the top of the table by means of screws 12 so that it may be used or not as occasion may require. When the straight edge 11 is used in connection with the straight edge 10, the squared block may be placed in proper adjustment on the table by locating one of its edges against the straight edge 10 and the adjacent edge against the straight edge 11 and the registering pointers for registering the plate on the block may then be brought into use. In the event the plate is already squared or in register with respect to the block on which it is mounted, the straight edge 11 may be dispensed with and the plate registering pointers to be hereinafter described may be relied upon to register the plate and its block for purposes of registering an insert in the plate by means of a set of insert registering pointers to be hereinafter described.

In describing the apparatus which forms the subject matter of my present invention, I shall conveniently refer to it as fitted to locate the insert or vignette in several successive plates from which a portion has been removed for the purpose of introducing a new feature in the print to be made from the plate, as, for example, where a plate constructed to print a label for use of tomatoes and bearing the print of a tomato is fitted to be used for pears by cutting out the piece of the plate for printing the tomato emblem and insert in its place a plate for printing a pear emblem. In making this change where several colors are to be printed, it is important that the inserts or vignettes in the successive plates corresponding to the different colors to be printed should occupy precisely the same relative positions to the remaining parts of the plate and it is to enable an operator to do this expeditiously and accurately as well as to register the plate on its block that my present apparatus is designed. At each of the opposite ends of the table, a pair of outwardly and upwardly extending brackets is secured, the pair at one end being denoted by 13, 14, and the pair at the opposite end being denoted by 15, 16. In the upper ends of the brackets 13, 14, pointed bearings 17, 18, are secured, the bearing 17 being screw threaded and working in a screw threaded socket in the bracket for

adjusting it toward and away from the bearing 18 and a lock nut 19 being provided for holding the bearing in position.

A shaft 20 has its opposite ends engaged with the pointed bearings 17, 18, and is supported in rocking adjustment by said bearings and in a similar manner a shaft 21 is supported in pointed bearings located in the upper ends of the brackets 15, 16, one of said bearings being adjustable toward and away from the other, like the bearing 17 to take up lost motion and hold the shaft 21 in rocking adjustment. On the shaft 21 there is located a sleeve 22, which may be locked in such position as desired along the shaft 21 by means of a set screw 23, the said sleeve having thereon a bearing plate 24 and on the bearing plate 24 there is a clamping plate 25, the bearing plate 24 and the clamping plate 25 having oppositely disposed V-shaped seats 26, 27, (see Fig. 3) for the reception of the shank 28 of a registering pointer, said plates being mounted in horizontally rotative adjustment. The plate 25 is forced toward the bearing plate 24 and the latter toward its seat by means of a wing nut 29 working on a screw threaded stud 30 set in the plate seat or support and extending upwardly through the bearing plate 24 and clamping plate 25. In like manner, the shank 31 of a registering pointer is secured between a bearing and clamping plate on a sleeve 32 on the shaft 20 and in a similar manner the shanks 33, 34, of registering pointers are secured between bearing plates and clamping plates on sleeves 35 and 36 on a shaft 37 mounted between pointer bearings in a manner quite similar to that described in respect to the shaft 20, the said bearings being located at the back of the table and the shaft 37 extending along at the back of and above the table at right angles to the shafts 20 and 21.

The construction of the several registering pointers is similar and the particular description of one will suffice for all. In the accompanying drawings, the section Fig. 5, showing the specific construction of a pointer, is taken in a plane transverse to the table and shows the specific construction of the registering pointer whose shank is denoted by 34 (see Fig. 1) connected with the sleeve 36 on the shaft 37. The structure is as follows:—To the shank 34 there is secured a depending bracket 38 and to the lower end of this bracket, one on either side of its depending portion 39, there are secured forwardly extending arms 40 and 41, the arm 41 (see Fig. 3) being a bar spring for pressing constantly against a pin, hereinafter mentioned, to take up lost motion. A piece 42, forming an extension of the shank 34 and provided with a socket 43 slides on the end of the shank 34 and is held against rotation by means of a pin 44 which

extends downwardly from the piece 42 between the arms 40 and 41. This pin 44 projects upwardly into a groove 45 formed in the under side of the end of the shank 34 to prevent the piece 42 from sliding off the end of the shank 34. The shank 34 has a reduced extension 46 which continues on through the piece 42 and is screw threaded at its outer end where a nut 47 is provided to hold the piece 42 against the tension of a spring 48 which encircles the extension 46 within the socket 43. A horizontally swinging arm 49 is hinged to the forward end of the extension 42 by means of a pintle 50 extending through a vertically elongated bearing on the arm 49 into the under side of the extension 42.

A lug 50* (see Fig. 3) projects rearwardly from the elongated bearing on the arm 49 and carries a set screw 50** which bears against a depending lug 50*** on the extension 42 to swing the arm 49 and parts carried thereby in a horizontal plane. Assuming the shank of the registering pointer to be adjusted at right angles to the rock shaft, as shown in the drawings, the screw 50** works in a direction parallel to the axis of the rock shaft which supports the registering pointer while the screw 47 works in a direction at right angles to said shaft. That is, the screws 50** and 47 work in directions at right angles to each other. In the forward end of the arm 49 there is an open ended socket 51 through which a bolt 52 extends, the head of the bolt being provided with a perforation 53 for the reception of the shank 54 of the pointer proper 55, for holding the pointer in different horizontal positions toward and away from its immediate hinge support. A foot piece 56 is provided with an opening therethrough in alinement with the socket 51 and said foot piece is provided with a recess 57 in its bottom for the reception of the head of the bolt 52. The bolt 52 is provided with an adjusting nut 58 on its screw threaded upper end, which, when turned down, against a coiled spring 58* inserted in the socket 51 and bearing at its inner end against an annular shoulder 58** on the inner wall of the socket, will draw upwardly on the head of the bolt, pressing the shank 54 of the pointer into engagement with the bottom of the foot piece 56 and at the same time pressing the foot piece 56 into engagement with the lower end of the wall of the socket 51. An elastic washer 51* is conveniently inserted between the nut 58 and spring 58*, whereby the shank of the pointer is yieldingly clamped in such laterally swinging adjustment as may be desired or a sufficient frictional resistance is exerted to cause the pointer to be held in the desired laterally swung adjustment against unintentional displacement while, at the same

time, it is permitted to be intentionally swung to adjust its downwardly directed pointed portion 55 directly over the registering mark on the plate or insert.

5 The construction of the registering pointer hereinabove described admits of first bodily moving the pointer as a whole forward and backward by relieving its shank 34 where it is held between the bearing and
10 clamping plates; secondly, moving the extension 42 and the parts carried thereby a limited distance outwardly and inwardly by means of the adjusting nut 47 working against the tension of the spring 48; thirdly,
15 the swinging of the pointer and its immediate support on the pintle 50; fourthly, swinging the pointer in the socket 51; and fifthly, adjusting the pointer outwardly and inwardly by sliding its shank forwardly and
20 backwardly through the head of the bolt 52. This double hinged adjustment admits of locating the pointer 54 directed at all times directly at right angles to the longitudinal axis of the table and parallel to the
25 transverse axis of the table or vice versa whatever may be the advance or backward adjustment of the pointer, and also admits of swinging the pointer and its immediate supporting arm to one side when placing a
30 plate or insert in position.

The mounting of the registering pointers on rock shafts admits of throwing one or more of the pointers bodily over away from the face of the table wholly out of the way
35 and such rocking movement of the pointer supporting shafts is permitted and limited as follows:—On each of the several rock shafts 20, 21, and 37, there is located a laterally extending arm 59 loosely mounted on
40 the shaft, for instance, the shaft 21, (see Fig. 6) by means of a hub 60 and on the hub 60 there is formed two adjacent flat surfaces 61, 62, set at right angles to each other. These flat surfaces 61 and 62 are
45 adapted to engage the flat face 63 on the upper end of an arm 64 secured to a short rock shaft 65 mounted in a bearing 66 on the bracket 16 the said shaft 65, having secured thereto an arm 67 extending preferably at right angles to the arm 64, the free
50 end of said arm 67 being pressed upon by a bar spring 68 resting at its opposite end upon a support 69 secured to the table, the tension of the said spring 68 being regulated by means of an adjusting screw 70
55 screwed into a projecting flange on the table and extending downwardly therefrom, the head of the screw bearing on the top of the spring 68.

60 The arm 59 is locked to a companion arm 71 keyed to the shaft 21, for example, by means of a feather and groove connection shown at 72, Fig. 6. The means for locking the arm 71 to the arm 59 is a screw stud
65 73 screwed into the outer end of the arm 59

and projecting through an elongated slot 74 in the arm 71 (see Fig. 7), the screw stud 73 being provided with a tail nut 75 which may be screwed against a washer 76 interposed between the nut and the arm 71 to
70 press the outer ends of the two arms 71 and 59 into close frictional contact.

The elongated slot 74 in the arm 71 admits of rocking the shaft 21 and hence the registering pointer carried thereby a short
75 distance relative to the arm 59, the latter being held in a predetermined position by means of the spring pressed arm 64 against the flat surfaces 61, 62, thereby permitting
80 an adjustment of the pointed end 55 of the registering pointer a little nearer to or farther away from the surface of the table or plate thereon to account for any shortening of the pointed end of the pointer by grinding or to account for unusual thicknesses
85 of plate or block, *i. e.*, the arm 59 may only swing into each of two positions determined by the flat surfaces 61, 62, and the arm 64 while the shaft 21 by changing the relation of the arm 71 keyed to the shaft
90 with respect to the arm 59 may be allowed to pitch the pointer a little farther downward toward the plate or not so far toward the plate when swung over into position as
95 the exigencies of the case may require.

While I have described the arm 59 and its spring retaining device with respect to the shaft 21 it is to be understood that there is a similar structure for holding the shaft in
100 either of its two positions, to wit; with the registering pointer swung over into operative position in proximity to the plate or swung back out of the way for each of the other shafts 20 and 37.

For clamping the plate in position on the
105 table in addition to the dogs which slide along the undercut grooves on the face of the table and hereinabove described, I provide two overhanging arms denoted by 77 and 78
110 spaced a short distance apart and projecting forwardly from the back portion of the table and mounted in supports 79, 80, adapted to slide longitudinally of the table along an undercut groove 81 in the face of the table and
115 near the back part thereof. The supports 79 and 80 are each provided with a pair of standards, the standards on the support 79 being denoted by 82, 83, and those on the support 80 being denoted by 84, 85. The
120 arms 77 and 78 are quite similar in their structure and each is secured in longitudinally sliding adjustment in a socket piece 86 hinged between the standards on the sliding support and extending rearwardly as
125 shown at 87 (see Fig. 5) where it rests upon a sliding wedge 88 to be hereinafter described. The arms 77 and 78 are held normally above the surface of the table as far as the sliding wedge 88 will permit them
130 to be held by means of springs 89, 90, se-

cured at their upper ends to a lug 91 uprising from the socket piece 86 to the rear of its hinge support and at its opposite ends to the sliding support 80. The free ends of the arms 77 and 78 are provided with vertically operating set screws 92 provided with presser feet 93 for engaging the top of the plate indicated by the line 94, Fig. 5, when the plate and its block are laid upon the table.

The wedge 88 shown in cross section in Fig. 5 is shown in elevation in Fig. 4. It is held in position by suitable guides 95 and 96 to slide longitudinally along an incline 97 formed at the back of the table and is operated by means of a link 98 pivotally secured at one end, as at 99, to the wedge and at the opposite end, as at 100, is pivoted to the end of a crank arm 101 on a shaft 102 which extends from front to rear along the base of the table being mounted in suitable bearings therein and provided at the front of the table with an operating handle 103. It is intended that the wedge 88 shall be moved to such an extent as to bring the presser feet 93 into proximity to the face of the plate to be held and that the set screws 92 shall then be turned sufficiently to just touch the plate and the wedge then moved to throw the presser feet into clamping adjustment although the wedge 88 might be thrown sufficiently far to throw the presser feet 93 into close pressing contact with the top of the plate without the intermediate setting of the presser feet, if found feasible. The arrangement of the link 98 and arm 101 is such that they form in effect a toggle lever and will be on center, as shown in Fig. 4, when the wedge is thrown to its advanced position to rock the clamping bars into clamping adjustment and when in such position the toggle lever forms a lock to hold the wedge in its advanced position.

In Fig. 1 an extra sleeve 104 is shown on the shaft 20 for holding a registering pointer. This is a reserve sleeve and pointer holder for use in some instances where it may be desired to have two registering pointers at the end as well as at the back for registering some unusual shape of plate.

The operation may be briefly described as follows:—Assuming that the plate is not registered on the block, the block having its two adjacent sides squared may be placed in position with these two sides against the straight edges 10 and 11. The plate may then be brought into the desired position with respect to the block, tacked in such position and the registering pointers on the shafts 20 and 21 be brought into register with the registering marks on the plate. Assuming the plate to have a portion cut out for the insertion of a different printing plate, the insert may then be placed in position in the cut-out portion of the original

plate and adjusted by the eye of the operator or by such measurements as he may see fit in its proper relation to the plate as a whole and it may then be tacked to the block in such position and the insert registering pointers at the back of the machine may then be brought into position to register with the registering points on the insert. This having been accomplished, the plate with its insert may be removed and succeeding plates for the various colors to be printed, whether the number be two, three, four, or more, may then be brought successively into position on their respective blocks without further requiring the use of the eye of the artist or careful measurements by simply bringing the plate proper into position with its registering marks under the points of the registering pointers and then placing the insert into position with its registering marks under the points of its registering pointers and tacking the plate and insert in position.

The use of the sliding dogs along the face of the plate and of the clamping screws in the overhanging arms and the adjustment of the arms by the sliding wedge, are features which have already been explained in connection with the description of the parts and need not be repeated.

It is obvious that changes might be resorted to in the form and arrangement of the several parts without departing from the spirit and scope of my invention; hence I do not wish to limit myself strictly to the structure herein set forth, but

What I claim is:—

1. In apparatus for registering printing plates, the combination with the table for supporting the plate and a registering pointer provided with a shank and supported at the side and reaching over the table, of means for moving the pointer bodily along the plate in a direction transverse to the length of the pointer, means for rocking the pointer into and out of horizontal and vertical positions, and means for holding the shank of the pointer in the desired horizontal and vertical positions.

2. In apparatus for registering printing plates, the combination with a suitable plate support, of a registering pointer supported in position to reach over the top of the plate, a double hinge support for the pointer proper in immediate proximity thereto, both parts of said hinge support being constructed to swing in horizontal planes and means for holding the pointer in different horizontal positions toward and away from its immediate hinge support.

3. In apparatus for registering printing plates, the combination with a suitable supporting table, of a registering pointer arranged to reach over the top of the table, a hinge support for the registering pointer

as a whole for locking it in a vertical plane and a double hinge support for the pointer for rocking it in a horizontal plane.

4. In apparatus for registering printing plates, the combination with a suitable table for supporting the plate and a registering pointer comprising a main shank, a pointer proper adjustably secured to the main shank and a support for the pointer proper, of means for preventing the rocking movement of the pointer proper support on the main shank.

5. In apparatus for registering printing plates, the combination with a suitable table for supporting the plate and a registering pointer comprising a main shank, a pointer proper adjustably secured to the main shank, and a support for the pointer proper, of a guide pin for preventing the rocking movement of the pointer proper support on the shank and a spring exerting a constant tension against said pin for taking up lost motion.

6. In apparatus for registering printing plates, the combination with a suitable plate support and rock shafts permanently mounted at right angles to one another at the edges thereof, of registering pointers for reaching over the top of the plate and slides on the said shafts forming supports for the pointers, the said shafts permitting the pointers to be swung out of position from over the plate.

7. In apparatus for registering printing plates, the combination with a suitable plate support, a registering pointer and a rock shaft forming a support for the registering pointer, of stop surfaces, a spring actuated presser device for engaging the stop surfaces and means for locking the shaft to said stop surfaces in different rocked positions for throwing the point of the registering pointer nearer to or farther away from the surface of the plate.

8. In apparatus for registering printing plates, the combination with a suitable plate support, of clamp supporting means adapted to reach over the top of the plate, a vertically adjustable clamping foot secured in said supporting means and a pointer provided with a shank engaged with said clamping foot.

9. In apparatus for registering printing plates, the combination with a suitable plate support, of a longitudinally sliding clamp supporting main shank extending over the top of the plate support, a vertically adjustable clamp connected with the free end of said shank and a pointer provided with a shank in immediate proximity thereto and engaged with the said clamp.

10. In apparatus for registering printing plates, the combination with a suitable plate support, of an over-hanging longitudinally sliding and laterally sliding clamp supporting arm, a clamp carried by said arm and means for mounting the arm in rocking adjustment.

11. In apparatus for registering printing plates, the combination with a suitable plate support, of a clamping arm extending over the top of the support, means for mounting the arm in rocking adjustment and a sliding wedge for operating the arm.

12. In apparatus for registering printing plates, the combination with a suitable plate support, of a clamping arm extending over the top of the support, means for mounting the arm in rocking adjustment, a sliding wedge for operating the arm and springs for holding the arm support in engagement with the wedge.

13. In apparatus for registering printing plates, the combination with a suitable plate support, of a vertically rocking arm, a sliding wedge for operating the arm and a toggle lever for operating the wedge.

14. In apparatus for registering printing plates, the combination with a suitable plate support, of a clamping arm extending over the top of the support, a rocking support for the clamping arm, the said rocking support being provided with a rearward extension and a sliding wedge arranged to engage said rearward extension for operating the support and hence the clamping arm.

15. In apparatus for registering printing plates, the combination with a suitable plate support, and a clamping arm for holding the plate on the support, of a sliding wedge for operating the clamping arm and a toggle lever for operating the wedge, the arrangement of the members of the toggle lever being such that they are on center when the wedge is advanced to force the clamping lever toward its work.

16. Apparatus for registering printing plates comprising a table for supporting the plates, registering pointers mounted at the opposite ends of the table and a plurality of registering pointers mounted at the side of the table, said pointers being mounted in both sliding and rocking adjustment.

In testimony, that I claim the foregoing as my invention, I have signed my name in presence of two witnesses, this twenty third day of January 1908.

VERNON ROYLE.

Witnesses:

F. GEORGE BARRY,
C. S. SUNDGREN.