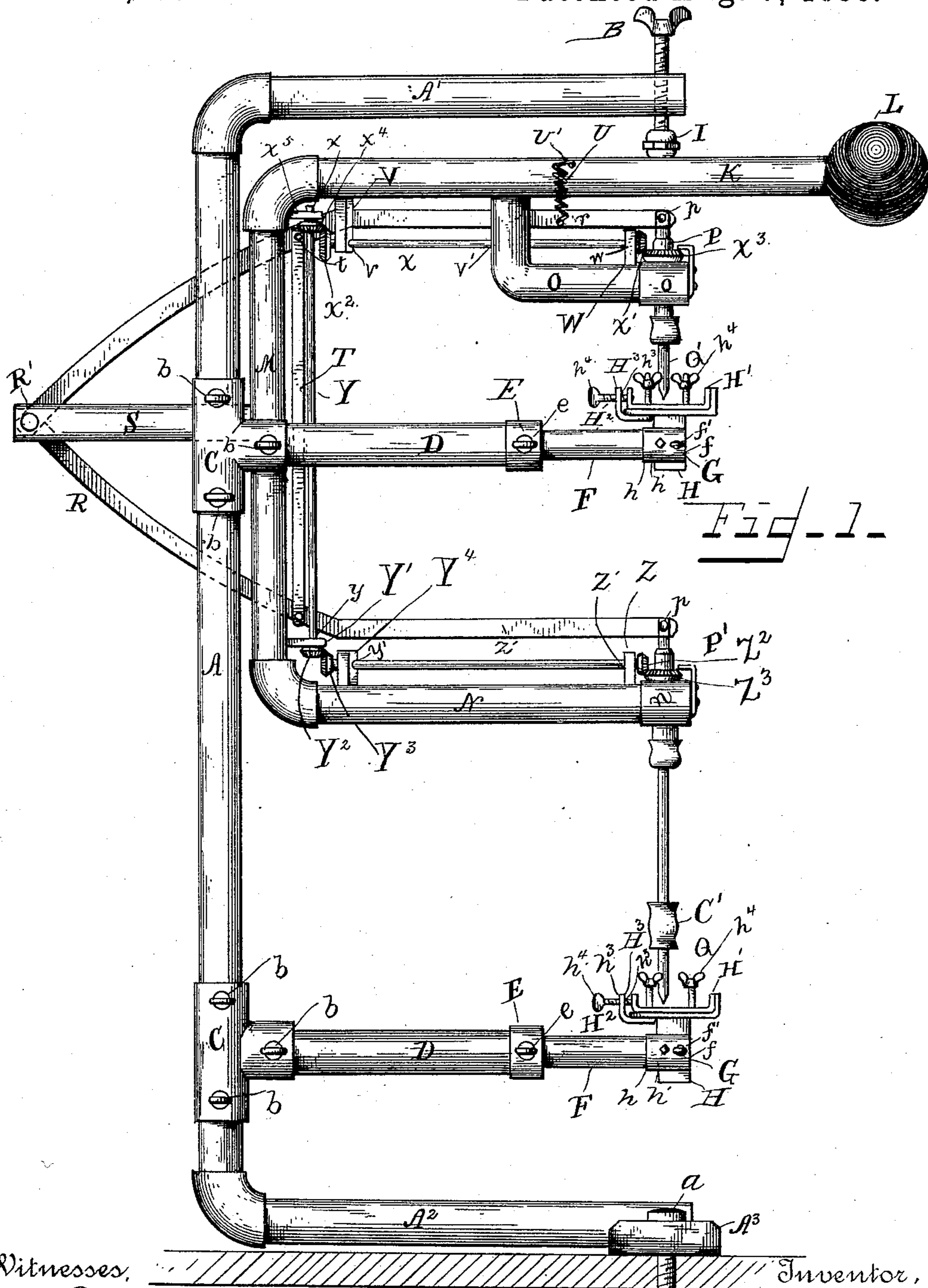


W. R. MOORE.
ENGRAVING MACHINE.

No. 387,595.

Patented Aug. 7, 1888.



Witnesses,

Thomson Cross
Chas M. Bates.

Inventor,

William R. Moore.

By his Attorney *Wm H. Bates.*

(No Model.)

2 Sheets—Sheet 2.

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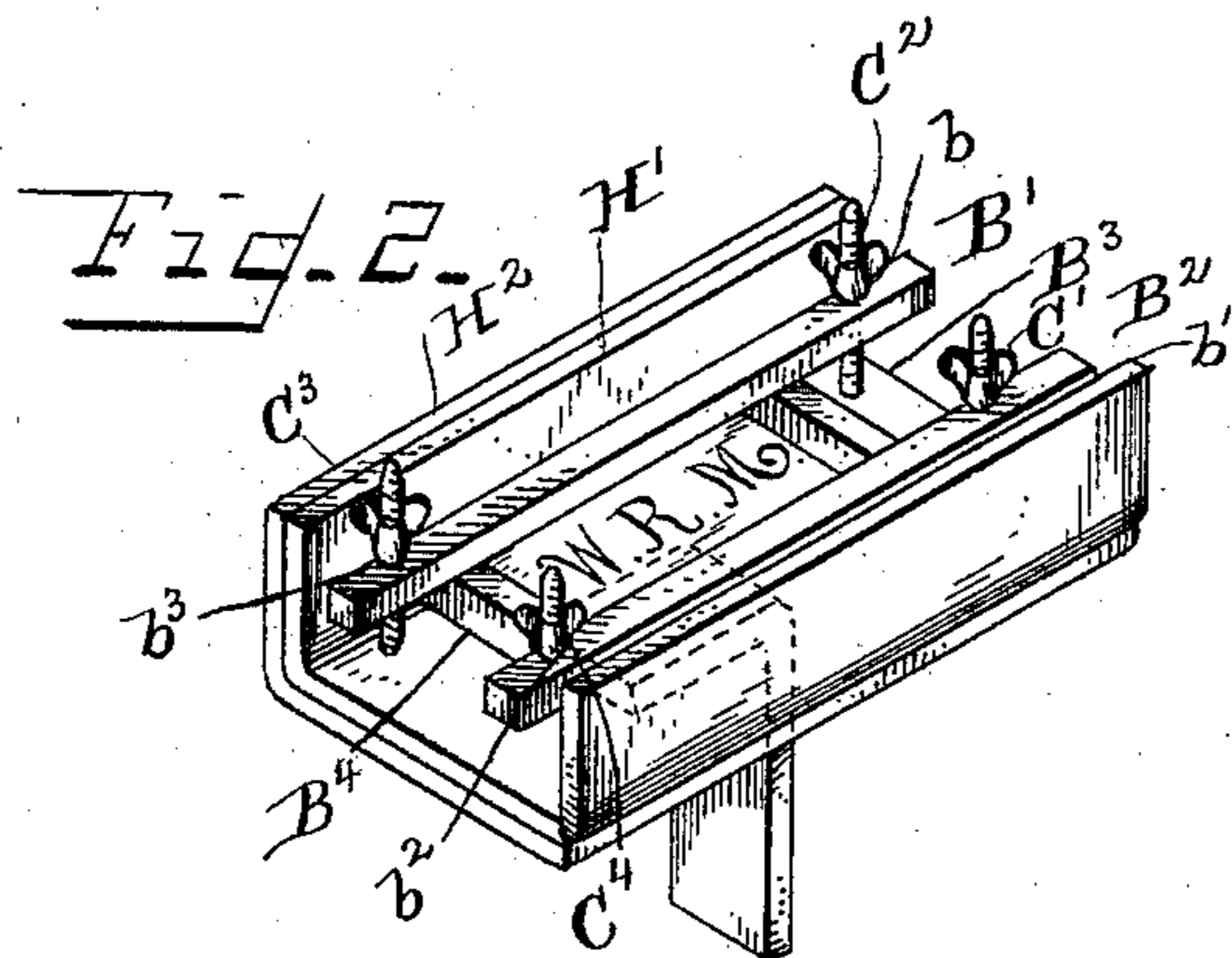


Fig. 3.

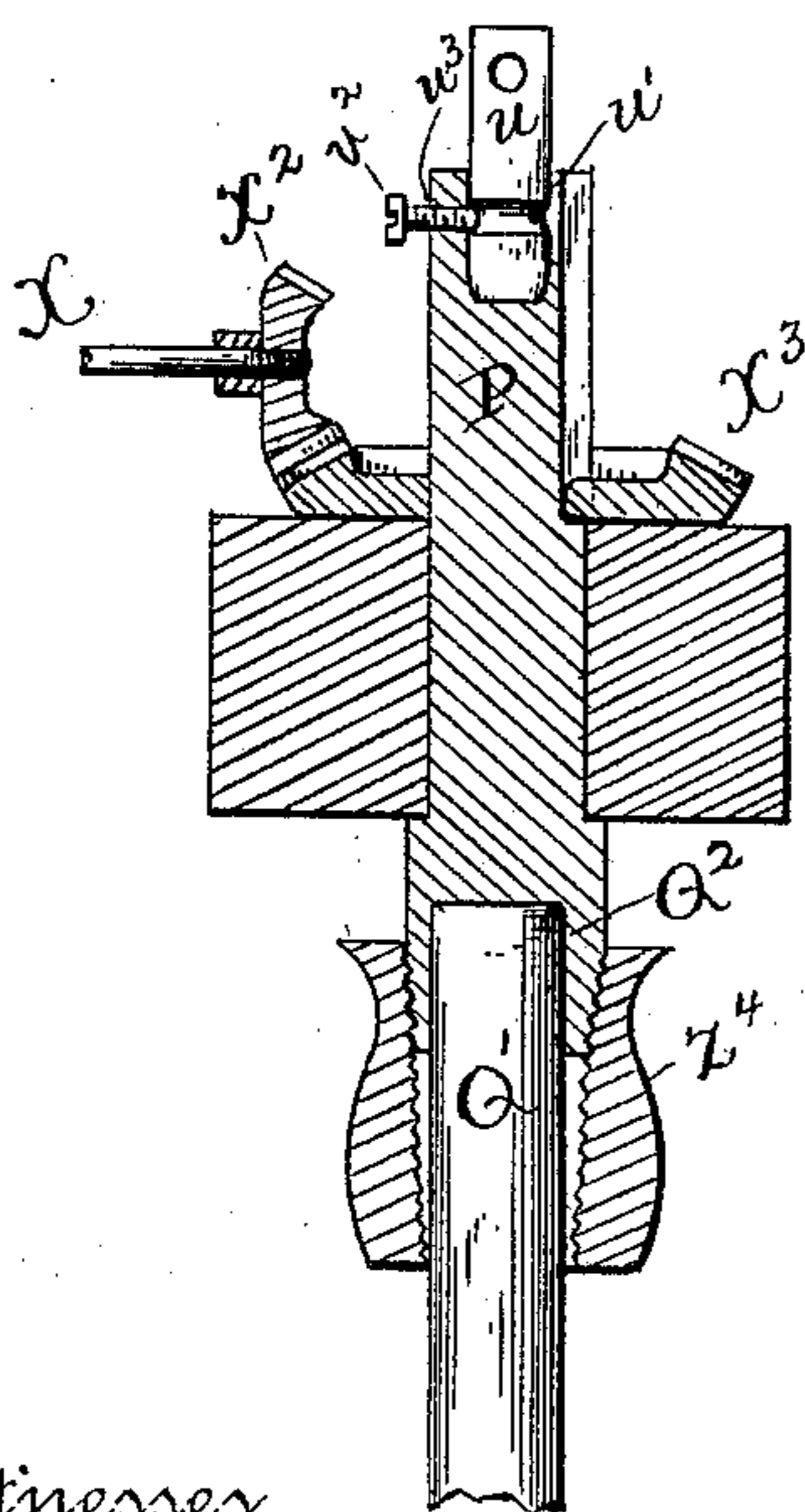
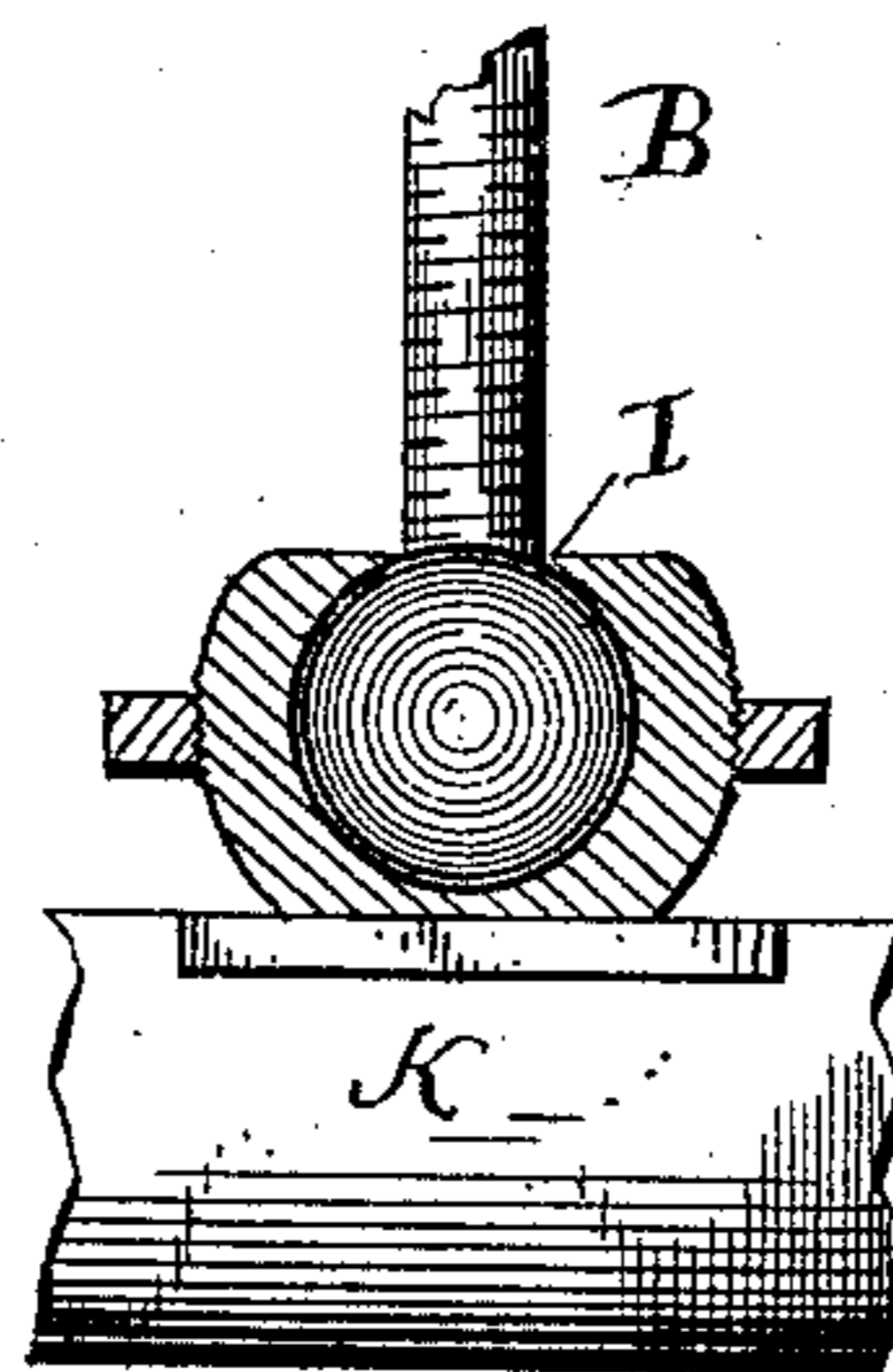


Fig. 4.



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UNITED STATES PATENT OFFICE.

WILLIAM R. MOORE, OF PHILADELPHIA, PENNSYLVANIA.

ENGRAVING-MACHINE.

SPECIFICATION forming part of Letters Patent No. 387,595, dated August 7, 1888.

Application filed March 22, 1888. Serial No. 268,155. (No model.)

To all whom it may concern:

Be it known that I, WILLIAM R. MOORE, a citizen of the United States, residing at Philadelphia, in the county of Philadelphia and State of Pennsylvania, have invented certain new and useful Improvements in Engraving-Machines; and I do hereby declare the following to be a full, clear, and exact description of the invention, such as will enable others skilled in the art to which it appertains to make and use the same.

This invention relates to improvements in machinery for tracing and engraving letters or designs of various sizes upon metal surfaces by means of a pattern, as a guide, whereby a saving of time and labor, as well as accuracy and uniformity in the character of the work, is accomplished.

The object of the invention is to simplify and improve the construction of this class of machines.

To this end the invention consists in the novel construction and arrangement of parts, as will be hereinafter more fully described, and specifically pointed out in the claims.

In the accompanying drawings, to which reference is had and which fully illustrate my invention, Figure 1 is a side elevation of the machine embodying my improvements. Fig. 2 is a perspective view of one of the work-holders and clamping-bars or follower, and Figs. 3 and 4 are detail views thereof.

Similar letters of reference indicate similar parts throughout the several views.

A represents a vertical standard, in this example made of metal tubing or gas-pipe; but, if preferred, it may be made of any suitable material. To the upper and lower ends of this standard A are permanently secured or formed integral therewith, at right angles to A, an upper and lower outer arm, A' A², the upper arm, A', having a perforation in its ends to receive a main adjusting-screw, for a purpose which will be hereinafter explained. The free end of the lower arm, A², is secured to a bed-piece, A³, having perforations made in its ends to receive screws *a*, by which it is secured to a table or other suitable fixture to hold the standard A and its attachments firmly in place.

Near the upper and lower ends of the standard A, and between the outer arms A' and A²,

are loosely secured, by means of set-screws *b b*, T-shaped adjustable thimbles or sleeves C C, the projecting ends of which receive one end each of two adjustable work-holding hollow arms, D D, the opposite ends of these arms being perforated near their free ends and provided with perforated collars E E, the perforations in the arms and collars being in alignment with each other, and through which are passed thumb-screws *e e*, which loosely secure the inner ends each of two shorter and telescopic extension-arms, F F, the outer ends of which are bifurcated and terminate in enlarged or collared ends *f f*, having perforations *f'* therein, through which are passed screws or pins G G, which loosely secure the downwardly-projecting stems H of a pattern and work-holder plates H' and holders H² in the bifurcations in the outer or free ends of the telescopic extension-arms F F. Thumb-screws *h h* are passed through perforations *h' h'*, made in the collared or enlarged ends of the telescopic arms F, by which is given one of the various adjustments to the pattern and work-holders at these points.

The elements just described and designated by the letters A A', A² A³, D D, and F F compose the main frame of the machine.

Pivotally secured to the outer end of the arm A' by means of the main adjusting-screw B and a ball-and-socket joint, I, and clearly shown in Figs. 1 and 4 of the drawings, is an auxiliary tool carrying operative frame K M N O, composed of a long upper horizontal arm having secured to its free end a counterpoise, L, the opposite end of this arm being secured to or formed integral with the upper end of a vertical arm, to the lower end of which is similarly secured another horizontal arm, the outer or free end of which terminates in enlarged or hollow capped end *n*. Secured to the under side of the arm K, about midway thereof, is the vertical end of a short angular arm, O, the other or free end terminating in a hollow capped or enlarged end, *o*, similar to the free end of the arm N. Both of these arms—the angular arm O and the horizontal arm N—have their free ends perforated in a vertical direction to receive the passage through them of the tool-stocks P P' of the tracing-tool Q and graver Q', said stocks of the respective tools being in alignment with each

other. The stocks P and P', or the tool-holders hereinbefore mentioned, are pivotally secured by stems *u* at their upper ends, as at *p*, to the free ends of a crane or bracing, R, the opposite ends of said bracing overlapping each other and terminating in a V-shaped point, which is pivoted together, as at R', and to the rear and free end of a projected short arm, S, of the vertical arm M. Near the point where the crane or bracing begins to assume a V shape a vertical bar, T, is pivoted at each end, as at *t*, said bar serving to further re-enforce and strengthen the crane or bracing R, from the free ends of which the tool-holders or stocks P P' depend. Near the forward and free ends of the upper portion of the crane or bracing R is a perforation, *r*, through which one end of a coil-spring, U, is secured, the other end of the coil-spring being secured around a screw, U', secured about midway and upon one side of the arm K, thus forming a spring-connection between the bracing R near one of its outer and forward ends and the arm K.

Around the lower ends of the stems *u*, which are seated in the socketed upper ends of the stocks P and P', are annular grooves *u'*, within which bear the points of adjusting-screws *u''*, which pass through perforations *u'''* in the upper ends of the tool holders or stocks P and P', said screws serving to release from or retain secured in place the tool holders or stocks to the free or forward ends of the crane or bracing R.

To the lower ends of the stocks P and P' is adjustably secured the tracer and graver tools Q and Q', respectively, by means of screw-threads cut upon the lower ends of the tool-holders or stocks and screw-threads cut upon the inner surfaces of the nuts or thimbles Z', which hold the upper ends of the tools Q and Q' in sockets Q² in the lower ends of the stocks or tool-holders P and P'. Thus by this connection it will be readily seen that the tools can be secured and retained within the stocks, and when necessary can be released therefrom by unscrewing them as occasion may require, as clearly shown in Fig. 3 of the drawings.

Projecting downwardly near the rear end of the long arm K, and secured to its under side, is a lug, V, which has in its lower end a perforation, *v*, and through the vertical projecting portion of the angular arm O is another perforation, *v'*, and upon the upper side of the angular arm O, near its forward or free end, is secured another and shorter upwardly-projecting lug, W, having in its upper end a perforation, *w*, these perforations in the lugs V and W and the angular arm O being in alignment with each other. Through these perforations is passed and loosely held, so as to turn, an upper horizontal shaft, X, having secured to each end of it beveled pinions X' and X². The beveled pinion X', meshing with a bevel gear-wheel, X³, secured to the upper ends of the stock or tool holder P, and the

bevel-pinion X², meshing with the bevel-pinion X¹, secured to the upper end of a vertical shaft, Y, the upper end of which is projected through a perforation, *x*, in a lug, X⁵, secured to the upper part and upon one side of the arm M. The lower end of this vertical shaft Y passes through a perforation, *y*, in a lug, Y', secured to the lower end of the vertical arm M and in alignment with the lug X⁵, and has secured to its lower end a bevel-pinion, Y², which meshes with a bevel-pinion, Y³, upon the end of another lower horizontal shaft, Z', which is passed through a perforation, *y'*, in a vertical lug, Y⁴, secured to the upper side of the horizontal arm N. Near the outer or free end of this horizontal arm N, and secured to the upper part thereof, is another vertical lug, Z, having in it a perforation, *z*, through which is also passed the horizontal shaft Z', and upon this end of the shaft is secured another bevel-pinion, Z², which meshes with a bevel gear-wheel, Z³, secured to the tracer-stock P'.

The point of the graver is hollowed out upon one side, or describes a curve similar to that of the ordinary writing-pen, which is its cutting-point for cutting out the letters, designs, &c., upon metallic surfaces, and adjustably secured to the graver, a little above its point, is a turn-button or hand-hold, *e'*, by which the auxiliary frame and its attached tools are operated.

The operative auxiliary frame, with its various attachments, is pivotally and adjustably secured to the main frame A A' A², D D, and F F by means of a main adjusting-screw, B, and the ball-and-socket joint previously referred to, (see Figs. 1 and 4 of the drawings,) which form the fulcrum upon which the auxiliary frame articulates and derives its universal movements while engraving and tracing.

Referring again to the angular plates H', which are secured to the downwardly-projecting stems H, it will be seen that about midway their lengths are upwardly-projecting stems H³, which have perforations *h''* therein, through which are passed thumb-screws *h'*, by means of which the work-holding plates H' are adjusted upon the plates H² and held thereon at any desired point; or said thumb-screws release them from the plates H² when it is necessary to remove them. These plates H' and H² have four or more different adjustments relatively to the tracing and graving tools by means of the thumb or set screws *h*, pins G, thumb or set screws *e e*, and the telescopic extension-arms F F.

Within the plates H' H² are followers or clamping-frames composed of two longitudinal bars, B' B², and two shorter bars, B³ B⁴, which are placed at right angles to the former, the ends of the former overlapping them. These bars have perforations *b b' b'' b'''* therein near each of their ends, through which are passed thumb-screws C' C² C³ C⁴, the purpose of which is to hold down in place within the

plates or work-holders H' H^2 the metallic plates or metal surfaces to be operated upon, as clearly shown in Fig. 2 of the drawings.

The operation of my machine will be obvious from the foregoing description when taken in connection with the accompanying drawings, but may be briefly rehearsed, as follows: The operator having placed his metallic plates or other articles having metallic surfaces in the work-holders to be operated upon, then grasps hold of the hand-hold or turn-button secured to the tracing-tool, by which he traces out the letters or designs of any given size on the surface of the tracing-plate. The auxiliary or operating frame at the same time the tracing or marking out of the letters by the tracing-tool is in progress accommodates itself to every movement made by the tracing-tool, and simultaneously with this movement of the tracing-tool and auxiliary frame a corresponding movement is given or imparted to the graver, which is in alignment with and above the tracing-tool, through the medium of the gearing and their respective shafts, the graver cutting out the letters or designs as traced by the tracer with accuracy and uniformity characteristic of this class of machines. When it is deemed necessary to regulate or adjust the depth of the cut of the graver so that a deeper or shallower cut may be given upon the metallic plates or surfaces, the main adjusting-screw is turned to the right, which lowers the operative auxiliary tool-carrying frame gradually, which gives a deeper cut to the tools. On the other hand, if a shallower cut of the tools is desired, a reverse movement of the mainscrew is given, which raises the auxiliary frame and the tools give a shallower cut. This vertical adjustment which is given to the auxiliary frame and tools relatively to the plate or work holders is attained by another means of adjustment relatively to the tools. Instead of adjusting the tool-carrying auxiliary frame, the vertical adjustable arms, which are adjustably secured to the main frame and which carry the telescopic extension-arms and work-holding plates, can be adjusted upwardly or downwardly in a vertical direction and in juxtaposition to the point of the tools by means of the thumb-screws, which loosely hold the arms to the standard of the main frame. Thus it will be seen that the auxiliary frame carrying the tools can be adjusted to the plate-holders, and vice versa. A horizontal adjustment of the work or plate holders is also obtained relatively to the points of the tools to any degree desired in a forward and rearward direction by means of the telescopic extension-arms telescoping in the vertical adjustable horizontal arms and the thumb-screws passing through the perforations in the collared or free ends of said vertical adjustable arms. Another adjustment can be given the plate or work holders by the same means—i. e., the telescopic extension-arms and the thumb-screws of the vertical adjustable arms—and that is this: the plate

or work holders can be adjusted at right angles to the forwardly and rearwardly horizontal adjustment by the lateral movement of the telescopic arms within the horizontal vertical adjustable arms, which gives the plate-holders a lateral and angular adjustment of about forty-five degrees to either one side or the other of the telescopic extension-arms, as desired, the set-screws, which are passed in the perforations in the free ends of the telescopic arms, serving to steady and keep in proper position the plate-holders, the ends of said screws abutting against the stems of the plate-holders. There is still another and final angular adjustment of the plate or work holders with respect to the points of the tools in a forward and rearward direction, which is done through the medium of the pin which pivotally secures the downwardly-projecting stems of the plate-holders in the bifurcations in the outer or free ends of the telescopic extension-arms.

The various adjustments of the plate-holding arms and plate holders are clearly shown in dotted lines in the figures of the drawings.

Other objects of the various adjustments than those herein set forth will be obvious, and further mention of the same are deemed unnecessary.

My machine is simple in its construction, durable, and easily operated.

What I claim is—

1. In an engraving-machine, the combination, with a vertical standard and an upper and lower outer horizontal arm, of the vertically-adjustable horizontal arms, horizontal adjustable telescopic extension-arms provided with bifurcations in their outer ends, which receive the downwardly-projecting stems of the plate or work holders, said plate or work holders being pivotally secured to the stems, whereby an angular adjustment is given them, substantially as described.

2. In an engraving-machine, the combination, with the vertical standard and the upper and lower outer horizontal arms, the upper and lower inner horizontal vertical adjustable arms, and the horizontal rearwardly and forwardly adjustable telescopic plate or work holding arms, of the metallic plates secured to the bifurcated outer ends of the telescopic arms and provided with the follower and adjusting thumb-screws, substantially as described.

3. In an engraving-machine, the combination, with the vertical standard and its upper and lower outer horizontal arms, the upper and lower inner horizontal vertically-adjustable arms, and horizontal adjustable telescopic arms, of the T-shaped thimbles or sleeves supporting the vertically-adjustable arms and telescopic arms, substantially as described.

4. In an engraving-machine, the combination of the standard A , arms A' A^2 , D D , and F F , composing the main frame, of a pivotally-secured adjustable swinging auxiliary tool-carrying frame fulcrumed to the main

frame by means of an adjusting-screw, and ball-and-socket joint, substantially as described.

5 5. In an engraving machine, the combination, with the auxiliary frame, of the gearing and their respective shafts arranged as described, the stocks or tool-holders having socketed ends for the reception of their connecting stems and tools, whereby said stems
10 and tools are retained or released from their respective places by means of the threaded nuts or thimbles, and set-screws bearing in the annular grooves in the lower ends of the stems, and a turn-button or hand-hold upon
15 the tracer-tool, substantially as set forth.

6. In an engraving-machine, the combination, with the auxiliary frame, of the lugs secured thereto, through which are passed the respective shafts, having beveled pinions upon their ends meshing with beveled gear-wheels 20 secured to the upper sides, and at the free ends of the angular arm and lower horizontal arm of the auxiliary frame, substantially as described, and for the purpose forth.

In testimony whereof I affix my signature in 25 presence of two witnesses.

WM. R. MOORE.

Witnesses:

W. W. DOUGHERTY,
C. A. DOUGHERTY.