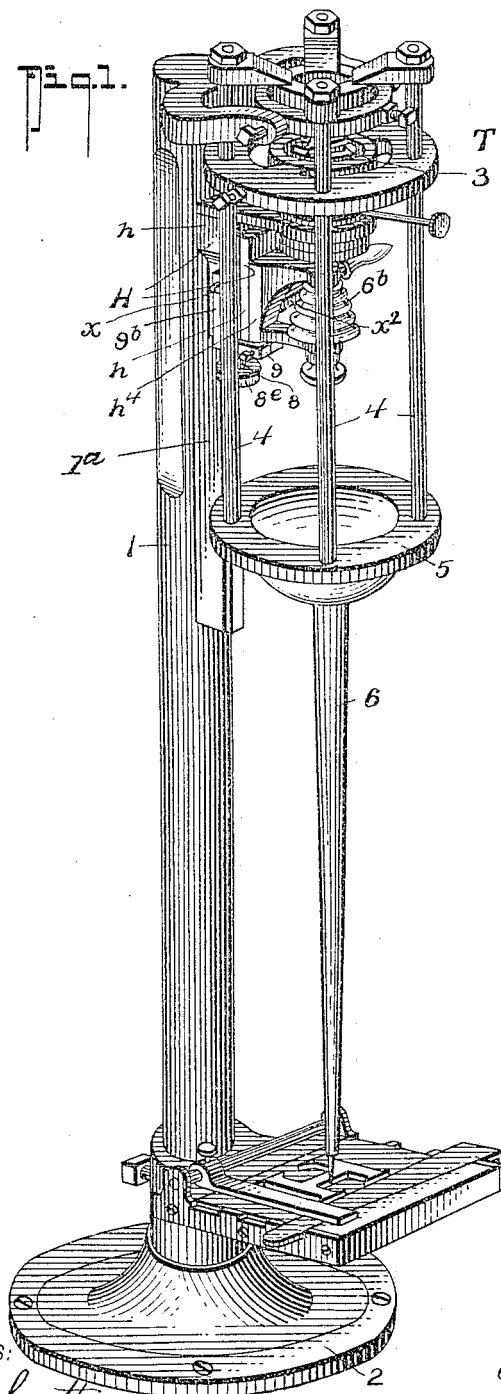


No. 787,197.

PATENTED APR. 11, 1905.

J. W. LEWIS.  
PUNCH CUTTING MACHINE.  
APPLICATION FILED FEB. 21, 1903.

2 SHEETS—SHEET 1.



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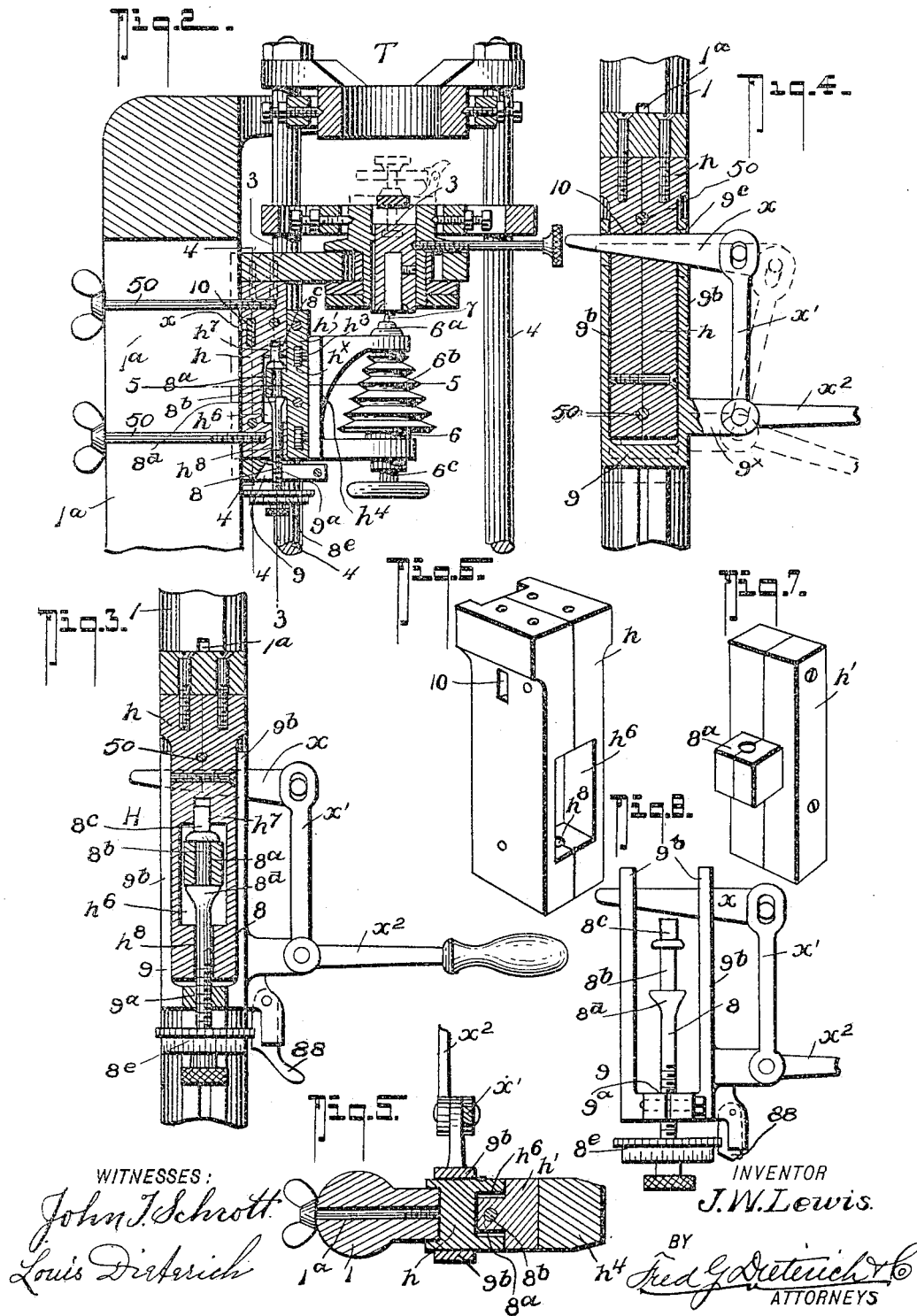
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# UNITED STATES PATENT OFFICE.

JAMES WILLIAM LEWIS, OF PHILADELPHIA, PENNSYLVANIA.

## PUNCH-CUTTING MACHINE.

SPECIFICATION forming part of Letters Patent No. 787,197, dated April 11, 1905.

Application filed February 21, 1903. Serial No. 144,463.

*To all whom it may concern:*

Be it known that I, JAMES WILLIAM LEWIS, residing at Philadelphia, in the county of Philadelphia and State of Pennsylvania, have invented certain new and useful Improvements in Punch-Cutting Machines, of which the following is a specification.

My invention, which relates to improvements in the Benton type of punch engraving or cutting machines, is more especially designed to provide an improved means for adjusting the tool-holder of that type of cutting or engraving machines. In the operation of cutting the punch in machines of the type stated the punch-holder is first set relatively to the cutting-tool so that the said tool will make the deepest cut at the outset, the complete reproduction of the pattern being accomplished only by the succession of a large number of cuts of gradually-decreasing depth. After each cutting operation it is necessary to adjust the punch-holder relatively to the tool for the next cut of slightly less depth, and the different adjustments are generally effected by moving the punch-holder a desired degree through the medium of micrometer-adjusting devices disposed at the upper end or head of the machine. From practical experience I have found that in cutting or engraving punch-blanks in the usual manner the cutting operations are repeated from twenty-five to seventy-five times before the point of the tool is reached, requiring many adjustments of the micrometer-gage devices which make it necessary for the operator to rise from a sitting position to a standing position at least once for every operation or adjustment performed. This movement of the operator after one or two punches have been cut becomes very laborious and effects a great waste of time.

My invention seeks to overcome the serious objections above noted in the manipulation of machines of the character stated and to provide a simple, effective, and economical improvement in the construction of the said machines whereby the operator can readily make the different adjustments and have them in full view, and thereby save considerable time in making the changes, and in which the improvements comprise parts having such correl-

ative arrangements with respect to the punch-carrying head and the tool whereby they can be easily and conveniently manipulated by the operator without the necessity of his rising from a sitting position.

With the above objects in view and others which will be hereinafter apparent my invention consists in certain novel combinations and peculiar arrangement of parts, all of which will hereinafter be fully explained, and specifically pointed out in the appended claims, reference being had to the accompanying drawings, in which—

Figure 1 is a perspective view of a punch cutting or engraving machine with my improvements applied. Fig. 2 is a vertical section of the upper end thereof with my improvements in an operative position thereon. Fig. 3 is a vertical section thereof, taken practically on the line 3 3 of Fig. 2. Fig. 4 is a similar view on the line 4 4 of Fig. 2 looking in the direction of the arrow. Fig. 5 is a horizontal section of the same on the line 5 5 of Fig. 2. Figs. 6 and 7 are detail views of the two-part head hereinafter referred to, and Fig. 8 is a detail view of head-adjusting means and the gage devices mounted thereon.

In the drawings the standard 1 has a base 2, and at the upper end of the standard the frame T is supported. The frame T carries the punch-holder 3 and is connected to said upper end of the standard by a universal joint.

4 designates the rods which form a part of the frame T and which support the disk 5, with which the index or tracer 6 is pendently and axially connected, all of the several parts explained being of a well-known construction and form *per se* no part of my present invention, my present invention being confined in its essential features to the peculiar construction of the tool-holding head, the means for effecting the adjustments of the tool-holding member which forms a part of said head, and the manner in which it is slidably joined with its mate or opposing head member.

In machines of the character before referred to the tool-holding head is stationarily held and the adjustments of the punch-holder relatively to the tool are usually effected by screw-actuated devices mounted at the top of the ma-

chine and which connect directly with the punch-holder, (see dotted lines in Fig. 2,) whereby to move the said holder, with the punch-blank, vertically to or from the cutting-tool. In my construction the tool-holding head H comprises two parts  $h$   $h'$ , one of which is held against and guided upon the upper end 1<sup>a</sup> of the standard and is fixedly held thereon in any desired manner, preferably by bolts 50 50, (see Fig. 2,) and the other,  $h'$ , supports the tool-carrier which is coöperatively connected with the part  $h$ , but has vertical movement thereon, and the said member  $h'$  also has horizontally-disposed T-grooves  $h^x$  to receive the T-studs  $h^s$ , which project from the rear edge of the tool-carrier  $h^t$ , in which is mounted the mandrel 6, having the usual chuck 6<sup>a</sup>, differential pulley 6<sup>b</sup>, and adjusting-screws 6<sup>c</sup>, as shown. 7 designates the tool, which is also of the ordinary form. The front of the head member  $h$  has a vertically-extended recess  $h^6$ , the upper end of which merges with a vertically-disposed tapering socket  $h^7$ , and the lower front portion of the member  $h$  has an aperture  $h^8$  in the axial line of the socket  $h^7$ . The member  $h'$  has a rearwardly-projecting lug 8<sup>a</sup>, that projects into the recess  $h^6$  in the part  $h$  and is movable vertically thereon, and the said lug 8<sup>a</sup> has an aperture to receive the stem portion 8<sup>b</sup> of a micrometer-screw 8, the threaded portion of which engages a threaded aperture 9<sup>a</sup> in the shifting block 9, which is held in engagement with the lower edge of the member  $h$ . The block 9 has vertical extensions 9<sup>b</sup>, which project over the two-part tool-carrying edge, as best shown in Fig. 3, and each of the extensions 9<sup>b</sup> has a keyed slot 9<sup>c</sup>, adapted under a proper adjustment of the block 9 relatively to the head  $h$  to register with the keyed slot 10 in the said head  $h$ , the purpose of which will presently appear. The screw-shank 8 has a head 8<sup>c</sup> for engaging the socket  $h^7$ , and the said shank 8 has a shouldered portion 8<sup>d</sup> for the lug 8<sup>a</sup>, whereby the parts  $h'$   $h$  are held to move together. The lower end of the micrometer-screw 8 carries a disk 8<sup>e</sup>, with graduations on the edge and on the upper face, whereby the adjustments of the said screw will always be in sight of the operator. It will be noticed by referring to Figs. 2 and 7 that the relation of the lug 8<sup>a</sup> and the recess  $h^6$  is such that the member  $h'$  will have a limited vertical motion with respect to the member  $h$ , which movement in the ordinary requirements in machines of the character stated need be only one-tenth of an inch more or less. To hold the micrometer-screw in its adjusted positions, I provide any suitable catch 88, as shown. By arranging the several parts as described it is manifest that the tool can be easily adjusted to its various positions relatively to the punch-stock during the operation of cutting by simply turning the micrometer-screw 8, which will shift the member  $h'$ , that carries the tool, to

the desired degree, and since the micrometer-screw has its bearing in a block that has movement independent of the fixedly-held part  $h$  it follows that by shifting the block 9 the tool, with the part  $h'$  and the micrometer-screw 8, can be moved in unison and the tool moved away from the work without disturbing the set of the micrometer-screw 8 or dial when such lowering of the tool is needed, particularly in getting in and out of the inside of the characters to be cut, it being also understood that the part 9 readily raises or lowers to the limit of the vertical movement of the screw 8 at the will of the operator. To provide for effecting the aforesaid unitary movement of the several parts stated, we have provided a convenient lever-actuated means, (illustrated in detail in Figs. 3, 4, and 8,) by reference to which it will be noticed the key  $x$  is in the nature of a wedge and the key-slot in the member  $h$  has a corresponding shape. The tapering or wedge key  $x$  is pivotally joined with an arm  $x'$  of a bell-crank lever fulcrumed in a bearing 9<sup>x</sup>, integral with the block or member 9. By using a wedge or tapering key and operating the same under a lever action as described it will be apparent that by depressing the lever member  $x^2$ , as shown in dotted lines in Fig. 4, the taper key will be turned out and by reason thereof permits the frame 9, together with the micrometer-screw and the vertically-movable member of the head, to lower with the micrometer-screw 8 while still held at the previously-set position.

An important advantage is gained by the actuating mechanism just described in that the operator can set the micrometer-screw to a predetermined depth and by gently raising the lever-handle 8 he can feed the tool to the stock or punch gradually, which is a great desideratum, owing to the small tool necessary for this class of work, the mere breaking of which delays the work ten or fifteen minutes, the handle  $x^2$  being in convenient reach, so that as one hand is manipulating the pointer or pattern-tracer the other hand is free for the required movement of the lever-handle  $x^2$ .

From the foregoing, taken in connection with the accompanying drawings, it will be apparent the operator in the practical application of my invention has his different adjustments at all times in full view and also the means for effecting the said adjustments convenient for manipulation at all times, thereby saving time in making the changes and much rising and sitting, such as has been heretofore required.

Having thus described my invention, what I claim, and desire to secure by Letters Patent, is—

1. In a punch-cutting machine, a two-part head, one section of which is fixed, the other section being movably mounted on the fixed section and adapted to support the tool, a mi-

5 crometer-screw joined with the movable section, a support for the micrometer-screw and a pivoted lever, a wedge-block connected therewith for engaging a wedge-socket in the fixed head-section, whereby the shifting of the lever will shift the slidable head-section together with its micrometer-screw devices, in unison, as set forth.

2. In a punch-cutting machine as described; 10  
the combination with the two-part tool-holding head, one section of which is adapted to be fixed—the other section being movably held on the fixed section, and adapted to support the tool-carrying mandrel, the fixed section 15  
having a tapering opening, a supporting member vertically adjustable with respect to the fixed section, a micrometer-screw engaging the movable tool-section and mounted in the supporting member, a bell-crank lever fulcrumed on said supporting member and a taper or wedge-shaped key slidable in the tapering opening in the fixed head-section and pivotally connected to the arm of the bell-crank lever, as set forth.

25 3. In a punch-cutting machine as described, a two-part tool-holding head, one section of which is stationary and the other section slidable on the stationary section and adapted to support the tool-carrying mandrel, in combination with a micrometer-screw joined with the movable section, a support having a bearing for said screw disposed below the head, a 30

graduated disk on the screw at a point below the bearing, said bearing having vertical adjustment with respect to the stationarily-held head-section, and means for vertically adjusting said bearing upon said stationarily-held section, for the purposes described. 35

4. In a punch-cutting machine as described, the combination of the fixed head portion having a recess in its front edge and a vertical aperture in the lower end which communicates with said recess, a screw-bearing at the point below the head, a support for said bearing including a pair of vertical extensions for embracing said fixed head portion, a tool-carrying member vertically slidable with respect to the fixed head portion, said member having an apertured lug projected into the recess of the said fixed head portion, a micrometer-screw operating in the screw-bearing whose shank extends through the aperture in the fixed head portion and whose upper end has a rotatable connection with the lug on the tool-carrying member and whose lower end terminates in a graduated disk, and means cooperating with the vertical extensions and the fixed head portion for locking the same together, all being arranged substantially as shown and described. 50 55

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Witnesses:

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ALFRED P. HOMER, Jr.