2 Sheets--Sheet 1.

T. W. MINTER.

Improvement in Engraving and Carving Machines.

No. 132,594. Patented Oct. 29, 1872.

Fig. 1.

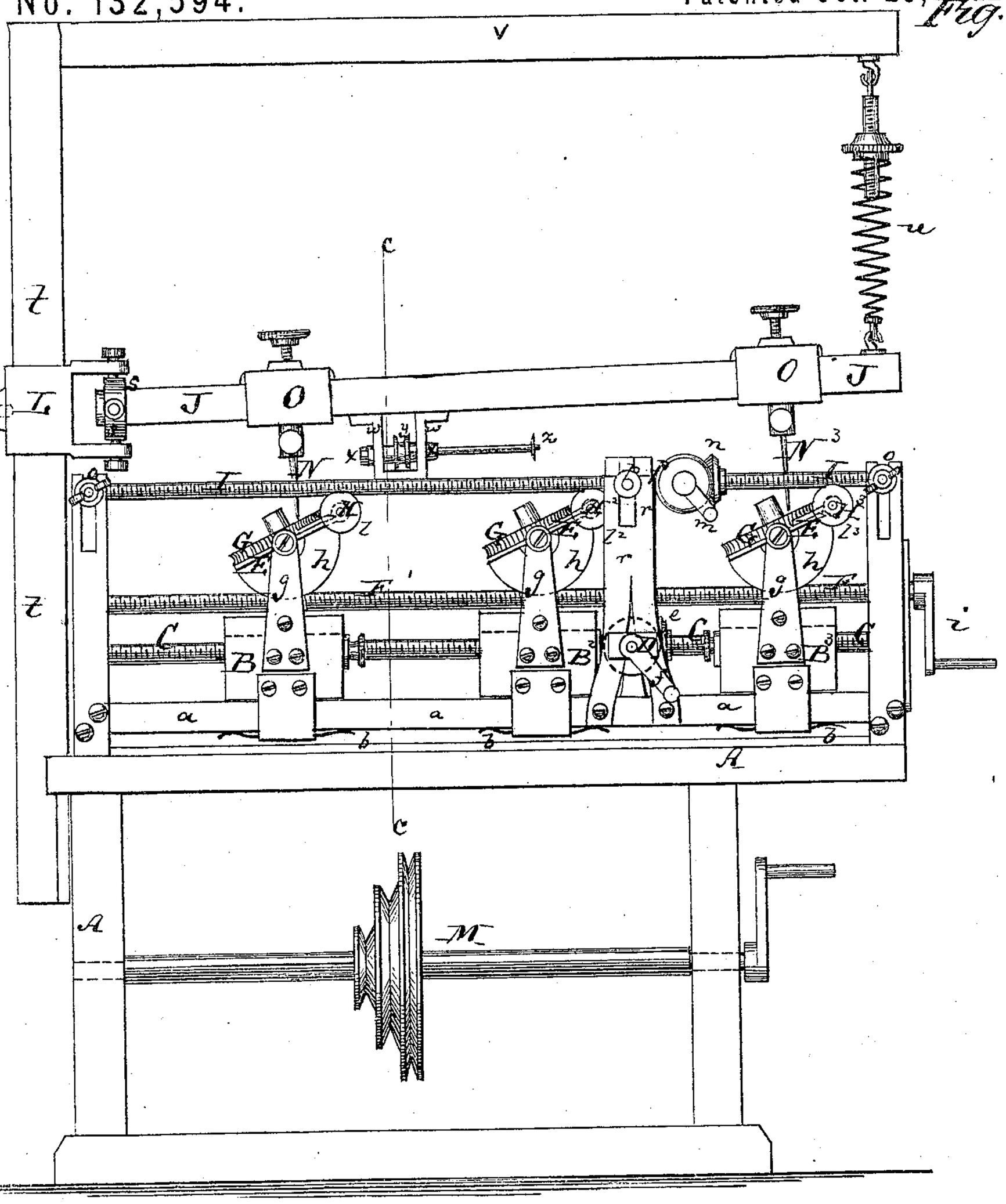
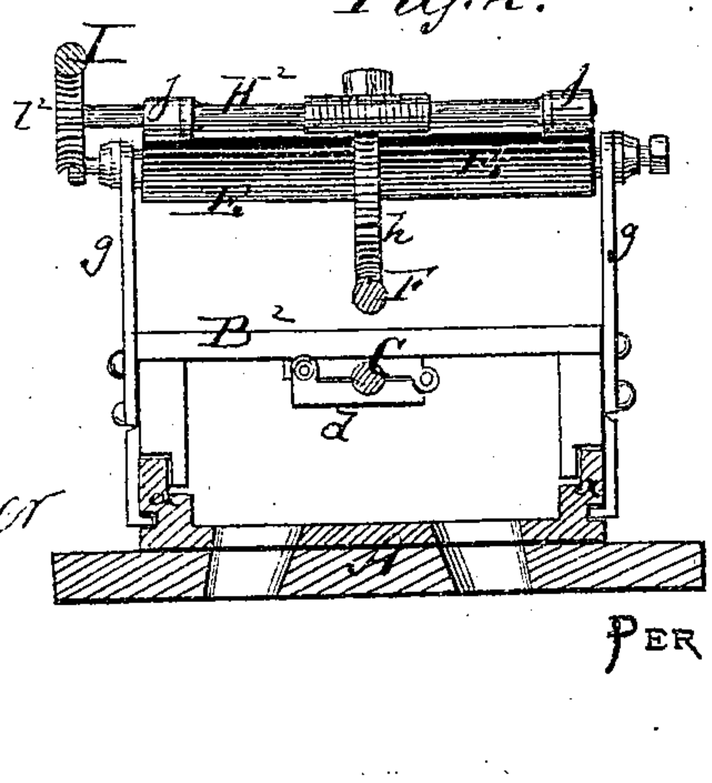


Fig. 2.



Witnesses:

John Becker

Solon C. Kemon

Inventor:

Thomas W. Minter

Per

Attorneys.

2 Sheets--Sheet 2.

T. W. MINTER.

Improvement in Engraving and Carving Machines.

No. 132,594. Patented Oct. 29, 1872.

Fig. 3.

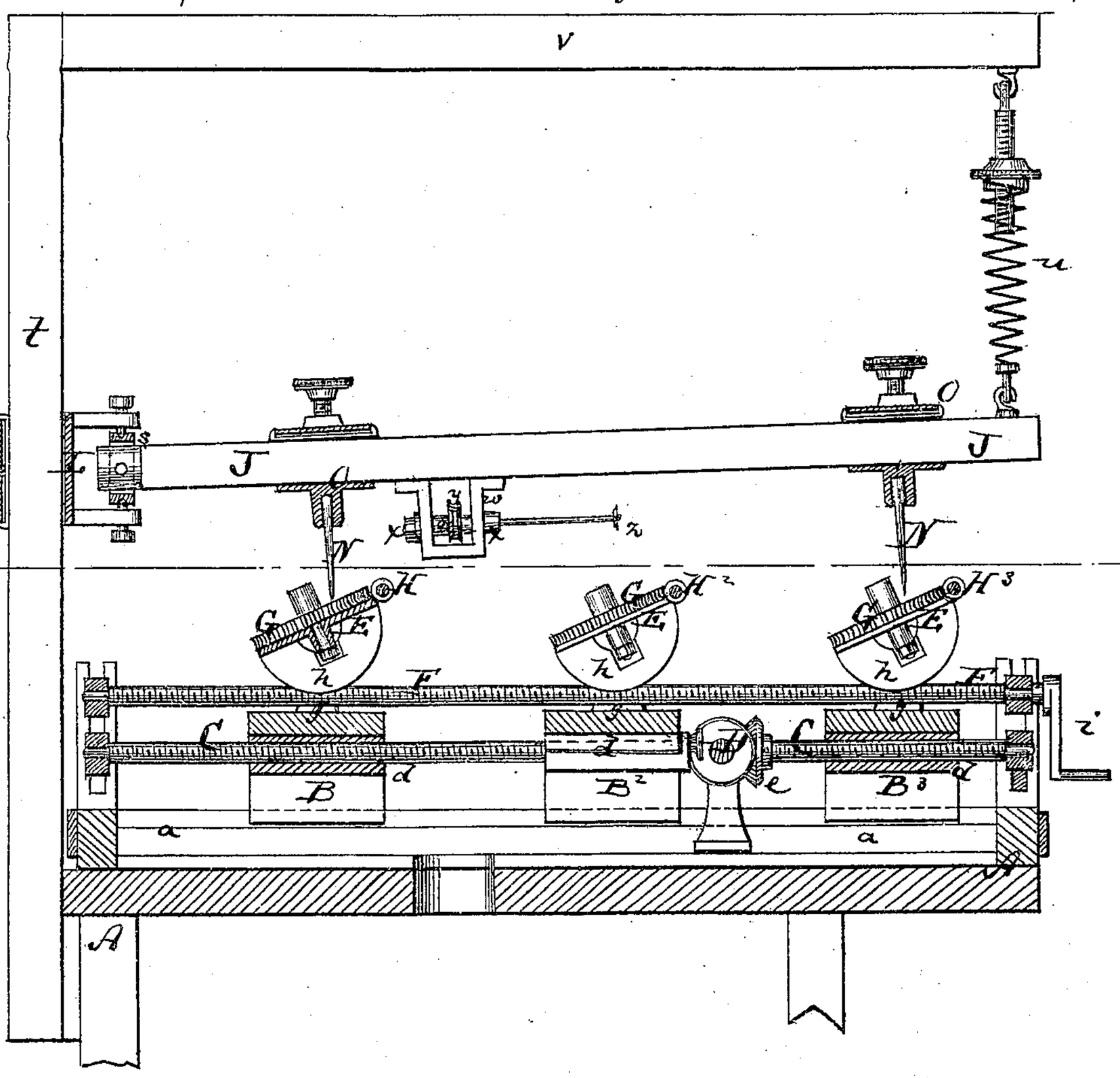
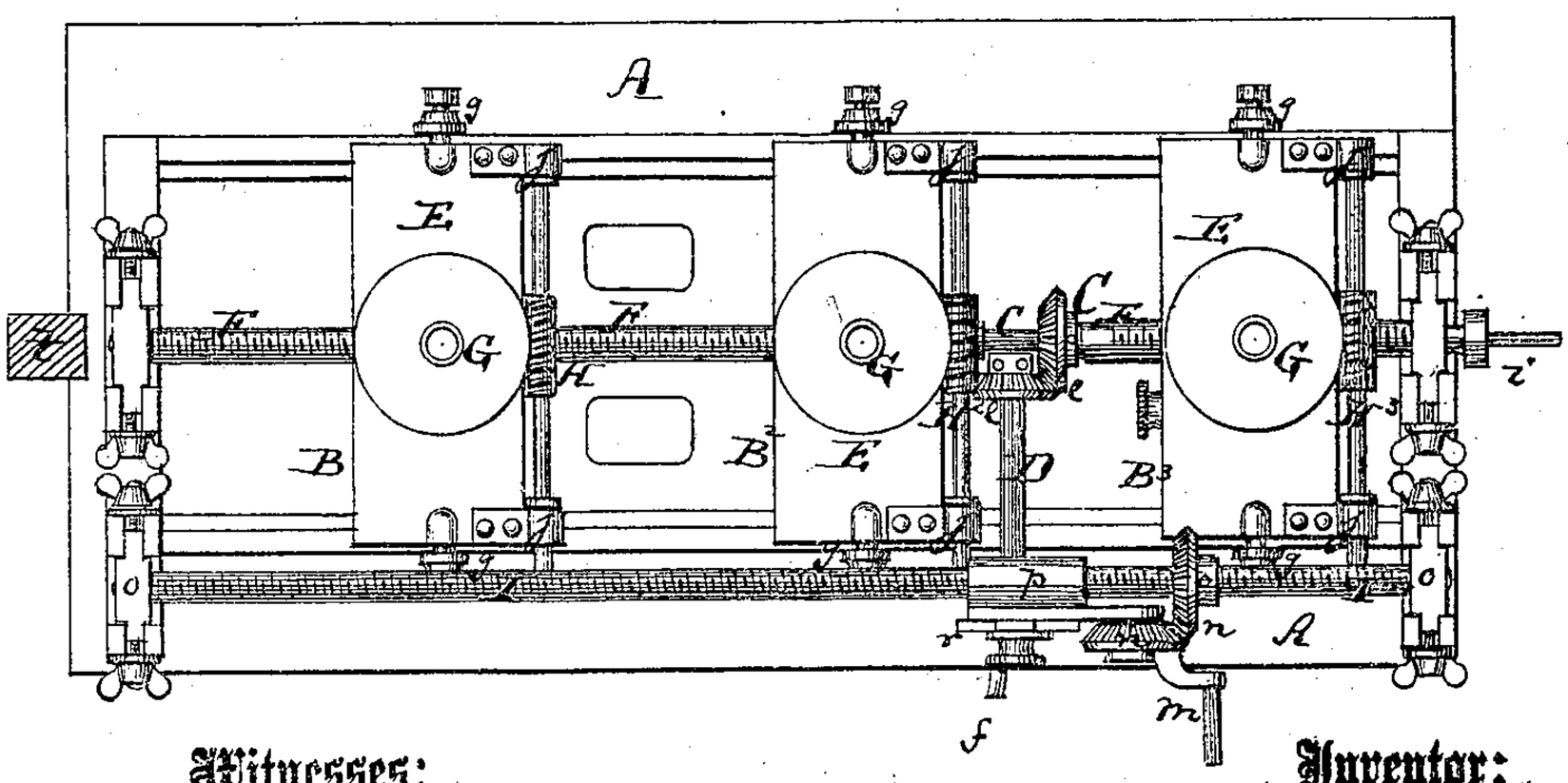


Fig. 4.



Witnesses:

John Becker.

Galon Kemon

Inventor:

Thomas W. Minter

PER

Munn & Co

Attorneys.

UNITED STATES PATENT OFFICE.

THOMAS W. MINTER, OF NEW YORK, N. Y.

IMPROVEMENT IN ENGRAVING AND CARVING MACHINES.

Specification forming part of Letters Patent No. 132,594, dated October 29, 1872.

To all whom it may concern:

Be it known that I, THOMAS WILLIAM MINTER, of New York city, in the county and State of New York, have invented a new and Improved Engraving and Carving Machine, of which the following is a specification:

In the accompanying drawing, Figure 1 represents a side elevation of my improved engraving and carving machine; Fig. 2 is a detail vertical transverse section of the same on the line *c c*, Fig. 1; Fig. 3 is a vertical longitudinal section; and Fig. 4 a top view, partly in section, of the same.

Similar letters of reference indicate corresponding parts.

This invention relates to a new machine for engraving and carving, die-sinking, cameo and intaglio cutting, and similar fine and delicate work, in stone, steel, or other material, with the object of enabling the exact and artistic imitation of suitable designs.

The engraving-machines now in use or heretofore proposed are not adapted to the finest kind of work, nor to the employment of all the tools necessary for fine workmanship. At present, for example, the process of seal-engraving and good cameo-cutting is carried out on a lathe with the use of over a hundred different tools, of such various shapes and kinds that the work can be ground away as fine as it is possible to do with the aid of magnifying glasses.

By my invention I desire to be able to use all those tools and let them work more or less automatically to copy any given design or pattern at an enlarged or reduced scale, but with as much truth and exactitude as could scarcely be attained by the most skillful artist. A steady man, but less experienced, will then be enabled to produce as good (or better) workmanship as that for which, thus far, more experienced and higher-priced hands had to be employed.

My invention consists, first, in fastening the engraving or carving tool in a spindle which hangs on a vibrating beam, said beam being also provided with the feeling or pattern pin. The chief novelty in this feature is not the vibrating beam, nor the combination of the same with the feeling-pin, nor even with the cutting-tool, as such combinations are known; but in fastening the tool in a spindle which hangs horizontally on the beam, and in revolving said spindle by belt-connection the same as a lathe-spindle, so that the tool can be used to the very same advantage as that to which it is at present used on the lathe only. The next feature of novelty consists in fastening the pattern and the article to be cut upon platforms which can be tilted into a suitable inclined position. The tool can thereby be made to work at any suitable angle on the material to be cut, and consequently to incisions of all kinds, not only straight up and down, as in the present engraving-machines, but also inclined, rounded, &c., as may be necessary for the making of reliefs for cameos or depressions for intaglios. The mechanism for thus inclining the pattern and the work is so united that both will be moved in exactly the same degree and offer the same angle of surface to the feeling-pin and cutter respectively. This tilting motion is effected by worm-wheel segments applied to the supporting-platforms of the pattern and work, and matching both into the thread of a screw, which, when turned, inclines them. Furthermore, my invention consists in making and applying disks to the aforementioned platform which are jointly rotating and longitudinally adjustable in equal degree, and in providing the nuts that embrace the longitudinally-adjusting screw, jointed to permit their being placed at suitable distances apart. Finally, the invention consists in hanging the screw which causes the joint rotation of the platforms in vertically-sliding boxes, so that it will accommodate itself automatically to the greater or less height of the platforms during their tilting motions.

In the accompanying drawing, A represents the supporting-frame of my improved engraving-machine. This frame is preferably made in form of a table, of wood or other material, and of sufficient strength to support the several parts of the machine during operation. *a a* are two horizontal rails rigidly affixed to the frame and parallel to each other. They serve as supports for three carriages, B, B^2, and B^3, which are all of equal size and style, at least preferably so, and which are, or may be, made to partly embrace the rails, as indicated in Figs. 1 and 2, with friction-rollers or springs *b* bearing against the lower edges of the rails to facilitate the longitudinal adjustment of the carriages. Each carriage is provided with a

nut, *d*, made in two parts, which are hinged together, as is indicated in Fig. 2. A longitudinal screw, C, which has its bearings in the ends of the frame, passes through all the nuts, *d*, so that all the three carriages will be simultaneously moved in the same direction and with equal speed whenever the screw is turned. A crank-handle for turning it may be directly applied to the end of the screw, or the latter may, by bevel-gear wheels *e e*, be brought in connection with a transverse shaft, D, which carries a crank-handle, *f*. Every carriage contains a platform, E, pivoted at its ends in posts *g g* which project from the carriage. A segment, *h*, is affixed to the under side of every pivoted platform E, and has a worm-thread cut into its edge, which is in gear with another longitudinal screw, F, whose bearings are in the ends of the frame A. All three platforms and their segments being alike, the effect of the screw F, when turned, will be the same on all, tilting or inclining them simultaneously and at an equal degree. A crank-handle, *i*, on the screw F, is used to turn it. To the upper surface of every platform E is applied a swivel-disk or plate, G, with a worm-thread around its periphery. Transverse screws H H^2 H^3, hanging in ears *j j*, which project from the several platforms, are in gear with the disks or plates G, respectively. Worm-wheels *l*, l^2, and l^3, mounted upon the ends of the transverse screws H, H^2, H^3, are in gear with a third longitudinal screw, I, whose bearings are in the end of the frame A. When the screw I is turned by means of a handle at its end, or by a handle, *m*, whose arbor connects by bevel-wheels *n n* with the screw I, all the three screws H, H^2, and H^3 will be turned in equal ratio, and all the three disks G by them in equal degree. When, by means of the screw F, the three platforms E are more or less tilted on their carriages, the plane of the screws H, H^2, and H^3 will become changed, and it is therefore necessary, as these transverse screws should remain in gear with the screw I, to make the bearings *o o* of the screw I vertically adjustable in their slotted supports. When the crank-handle *m* is used at right angles to the screw I it too should be made vertically adjustable by being hung in a sleeve, *p*, which loosely embraces the screw I and finds guidance in the slotted upright *r* of the frame A.

From the foregoing it will be clear that by means of the screw C all three carriages are simultaneously adjusted in longitudinal direction by means of the screw F, all three platforms are simultaneously and equally tilted, while by the screw I all three disks G will be equally and simultaneously turned. The disks being part of the platforms, and these again part of the carriages, the longitudinal adjustment of the latter will be shared in by all the platforms and disks, and the tilting of the platforms shared in by the disks. Whenever the distances between the several carriages are to be varied the hinged nuts *d* are swung open and thereby liberated from the screw C, so that the change of position can be effected, whereupon the nuts are reclosed.

J is a beam, pivoted in a ring, *s*, which is pivoted in ears of a vertically-adjustable slide, L, embracing a post, *t*, of the frame A. The free end of the beam J is suspended by a spring, *u*, from a horizontal arm, *v*, of the frame A. In a bracket, *w*, which is fastened to the under side of the beam, are the bearings of a spindle, *x*, which carries a pulley, *y*, and is prepared for the reception of the cutting-tool *z* in the manner in which spindles are usually prepared for the reception of such tools. The spindle can be revolved by a belt-connection with a driving-shaft, M, operated upon by means of a treadle or otherwise. From the beam are also suspended two vertical pins, N and N^3, which are attached to slides O, adjustable on J, and applied above the carriages B and B^3, respectively. The pattern to be imitated is secured upon the disk G of the carriage B^3 if its copy is to be reduced in size; or upon the disk G of carriage B when its copy is to be larger than the original.

The metal, stone, or other material to be cut is fastened upon the middle disk G. The several disks are, by preference, provided with tubular projections for the reception of pieces of wood upon which the patterns and material to be cut can be fastened. When everything is in place the screws C, F, and I are properly turned by the attendant to bring every part of the pattern-surface in contact with the feeling-needle N or N^3, which is from the beam J suspended against it. The cutting-tool will then also be raised and lowered in conformity with the design to be cut, and will produce such design on the material under it.

The machine may be made with but two carriages and their appendages when either no enlargement or no reduction is desired, or when the bracket *w* is made adjustable on the beam, or the beam reversible.

In order to enable the fastening of each platform in its tilted position while being longitudinally adjusted, in which case the screw F must be lowered to permit such longitudinal adjustment, and would consequently cease to support the platforms in their tilted positions, a slotted arch or plate should be applied to the end of each platform, to be fastened by a set-screw to the post G next to it.

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

1. The vibrating beam J, carrying the feeding-pin for contact with the pattern, and in a bracket, *w*, the rotary spindle *x*, to which the cutting-tool *z* is secured, substantially as herein shown and described.

2. The rotary disks G G, applied to the platforms E E, and combined with the transverse screws H H^2, to be turned simultaneously by means of a single screw, I, as set forth.

3. The tilting platform E, applied to an engraving-machine, substantially as and for the purpose herein shown and described.

4. The worm-segment *h*, applied to the pivoted platform E for connecting the same with the tilting-screw F, substantially as specified.

5. The nuts *d d* on the carriages B and B^2, when made jointed and hinged, substantially as specified.

6. The screw I for moving the transverse screws H and H^2, when made vertically self-adjusting to adapt itself to the varying heights of those transverse screws during the tilting motion of the platforms, as specified.

7. The combination of the three longitudinal screws C, F, and I with the carriages B B^2, platforms E E, disks G G, and transverse screws H and H^2, substantially as herein shown and described.

8. An engraving or carving machine employing a rotary cutter on a vibrating beam above a platform adjustable in every direction, as specified.

THOMAS W. MINTER.

Witnesses:

A. V. BRIESEN,

T. B. MOSHER.