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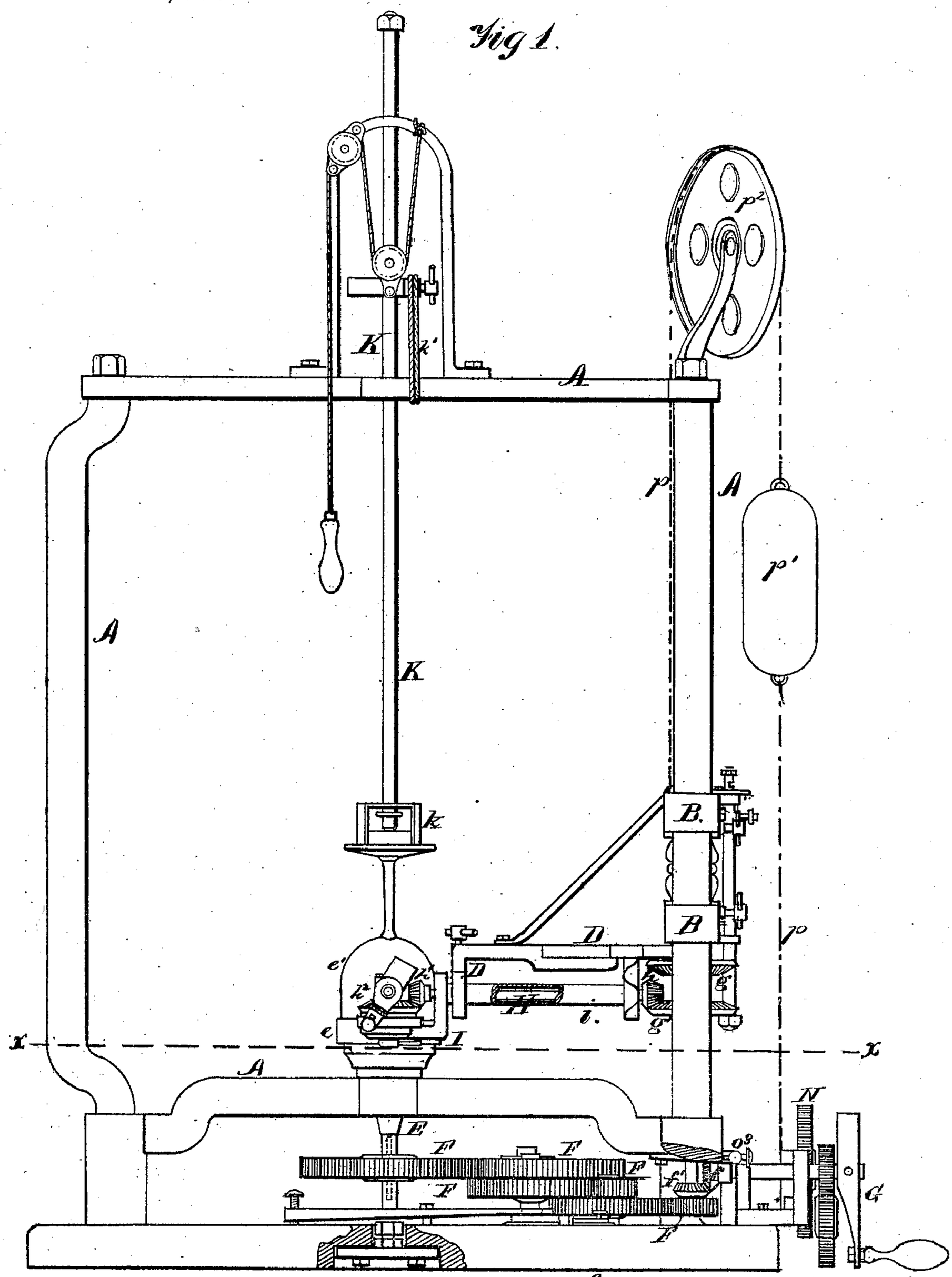
H. A. WASSELL.

Machines for Marking Designs on Glass, &c.

No. 135,610. Patented Feb. 4, 1873.

Fig 1.



Witnesses
W. Bradford
A. Edwards Gill

Inventor
H. A. Wassell
D. P. Holloway & Co.
Attys

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H. A. WASSELL.

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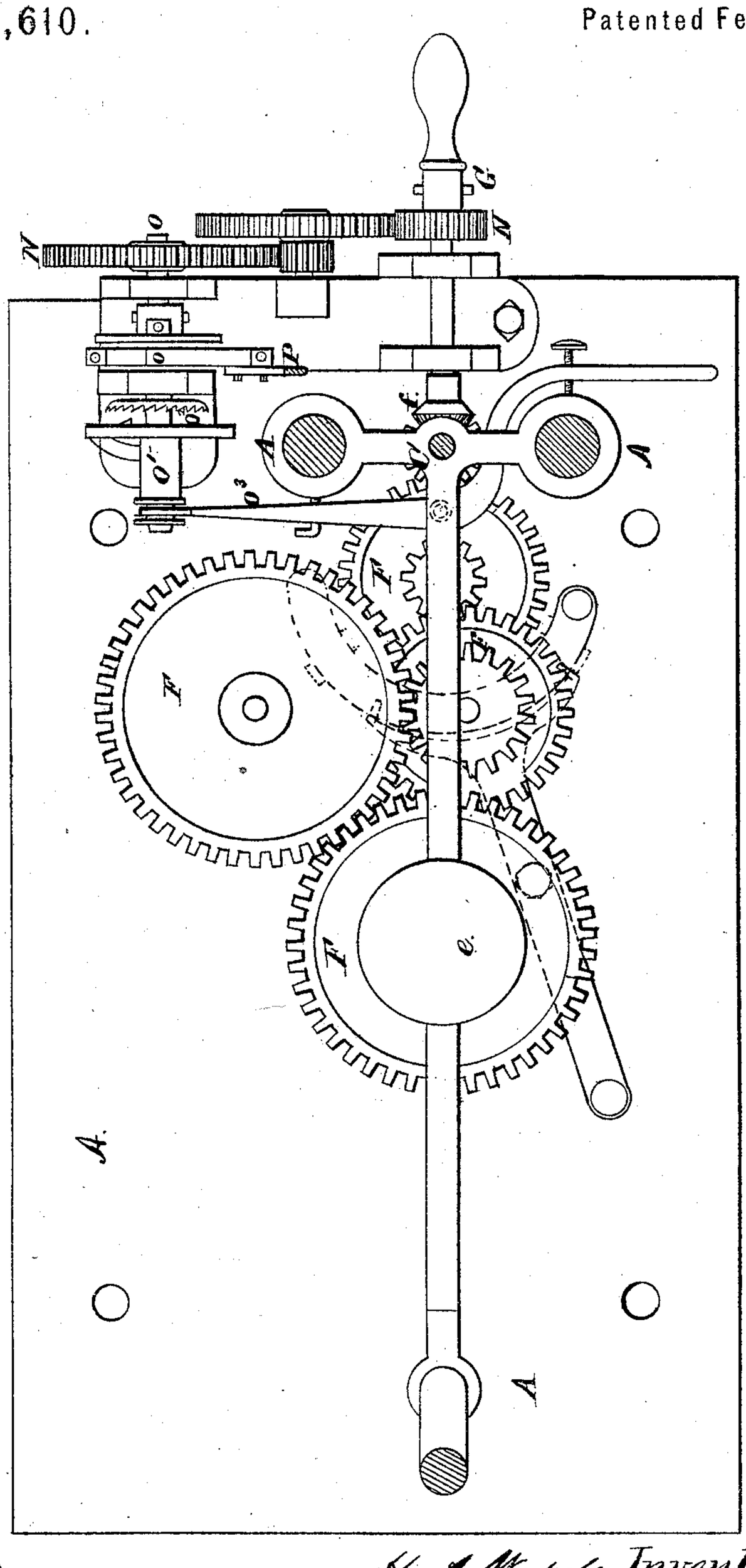

Fig. 2.

Witnesses
H. Bradford
R. Edwd. Hall

H. A. Wassell Inventor
D. P. Holloway & Co.
Attys

4 Sheets--Sheet 3.

H. A. WASSELL.

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Fig. 3.

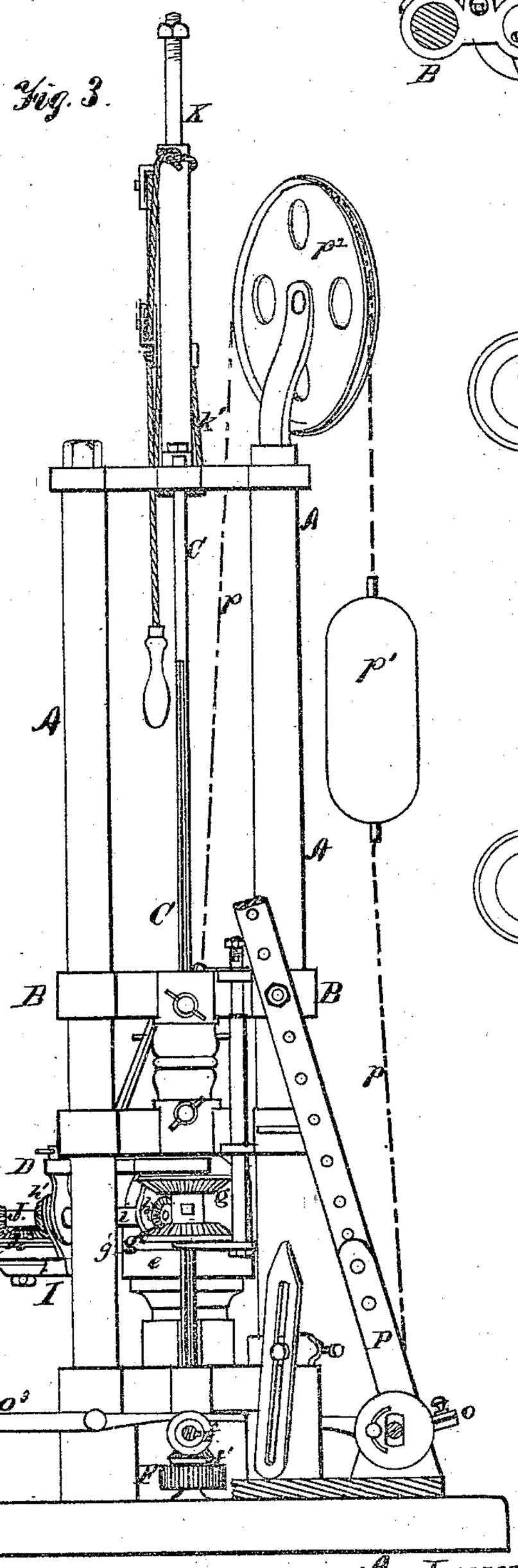


Fig. 4.

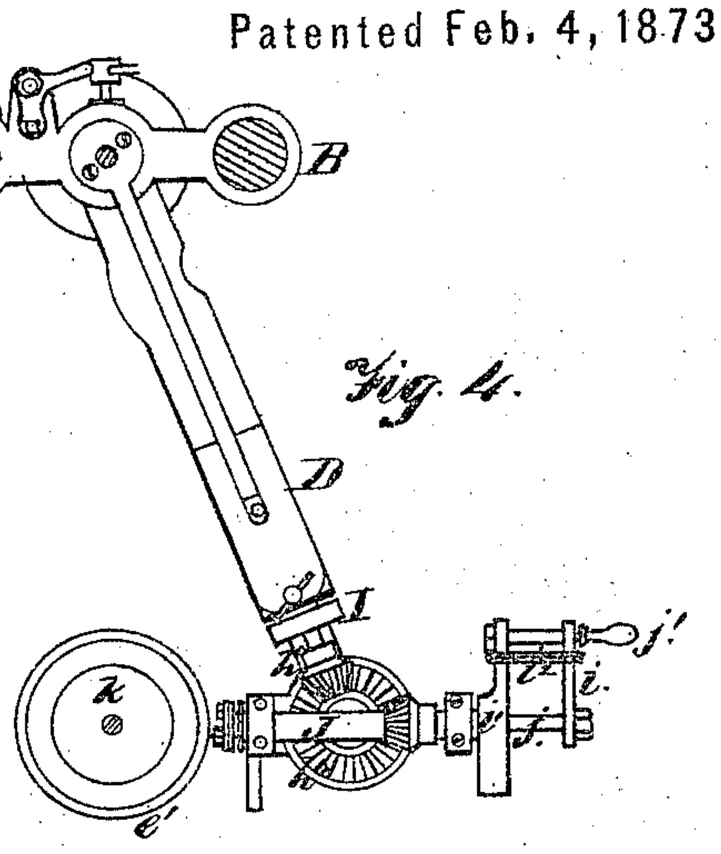


Fig. 5.

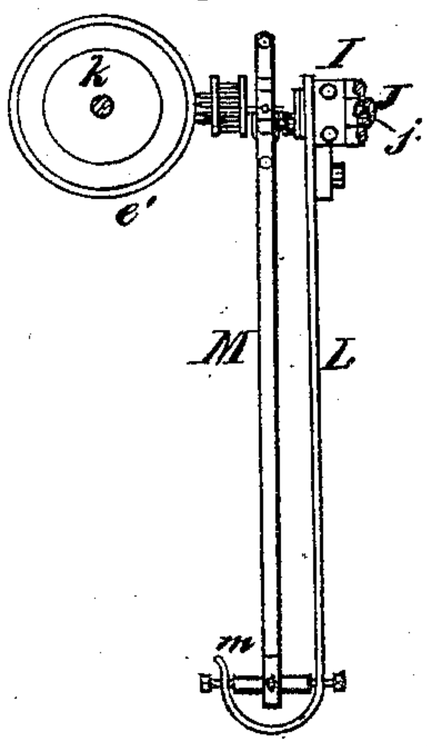


Fig. 6.

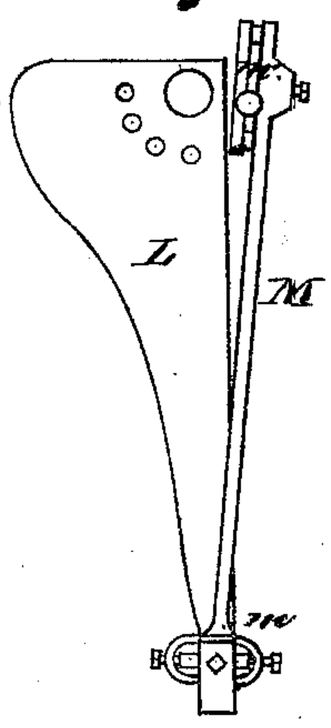
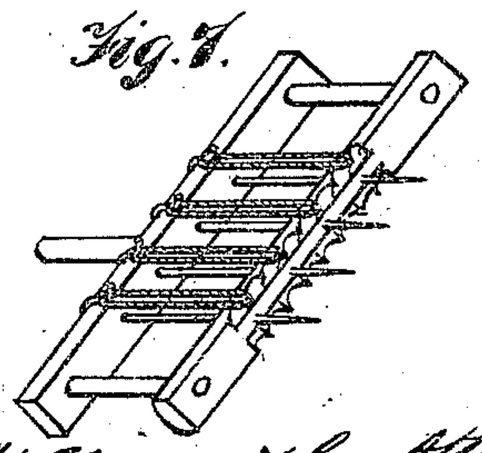


Fig. 7.



Witnesses
N. Bradford
A. Edwards Coil

Inventor
H. A. Wassell
D. P. Holloway & Co Attys

4 Sheets--Sheet 4.

H. A. WASSELL.

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Fig. 8

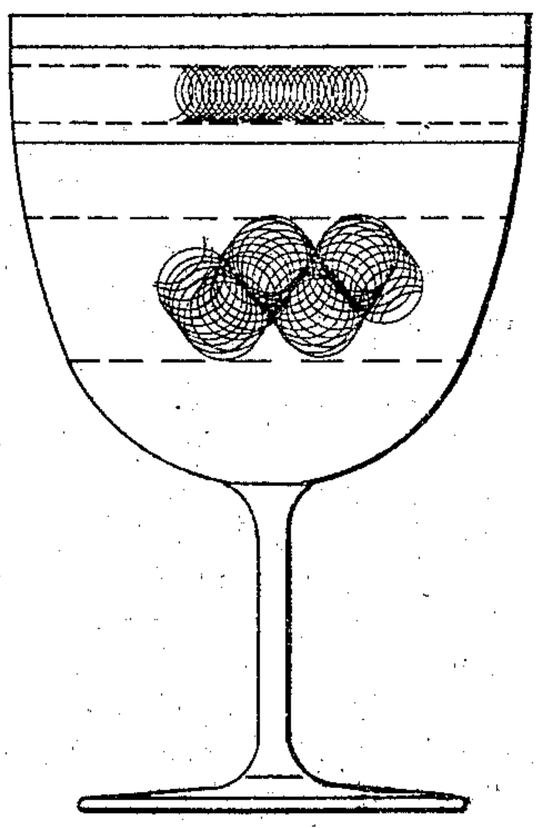


Fig. 9.

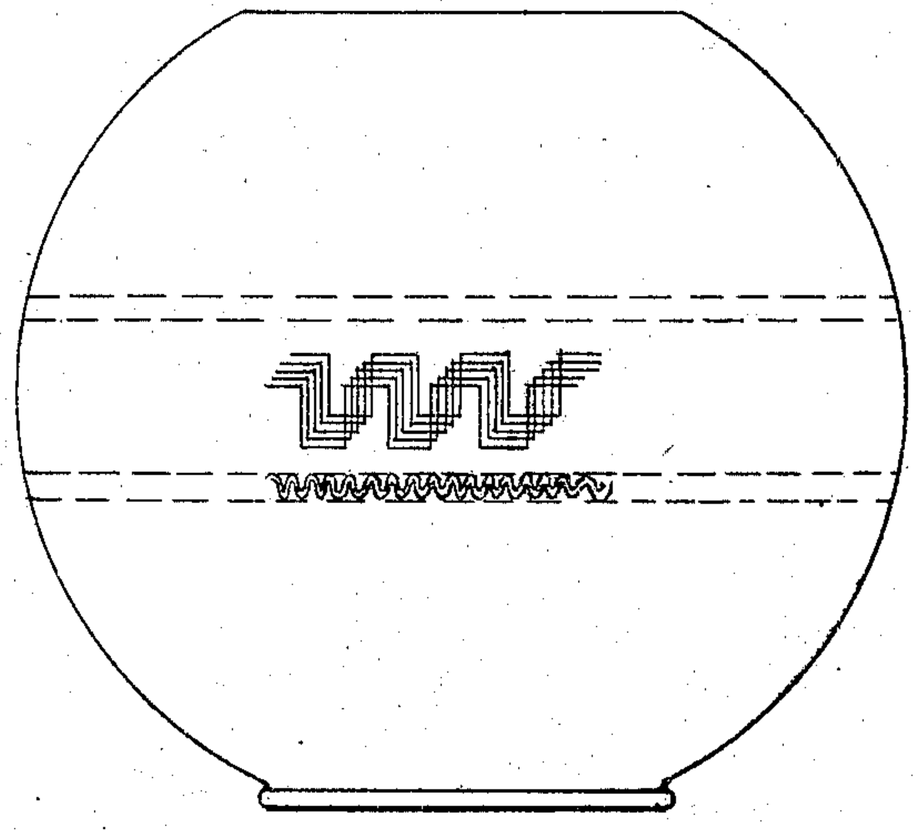


Fig. 11.

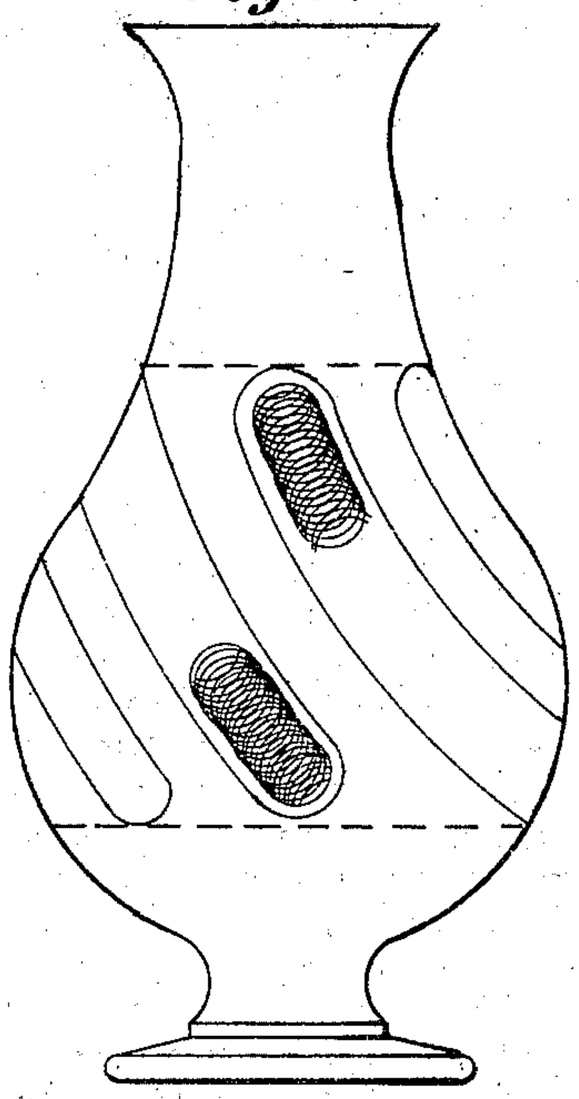
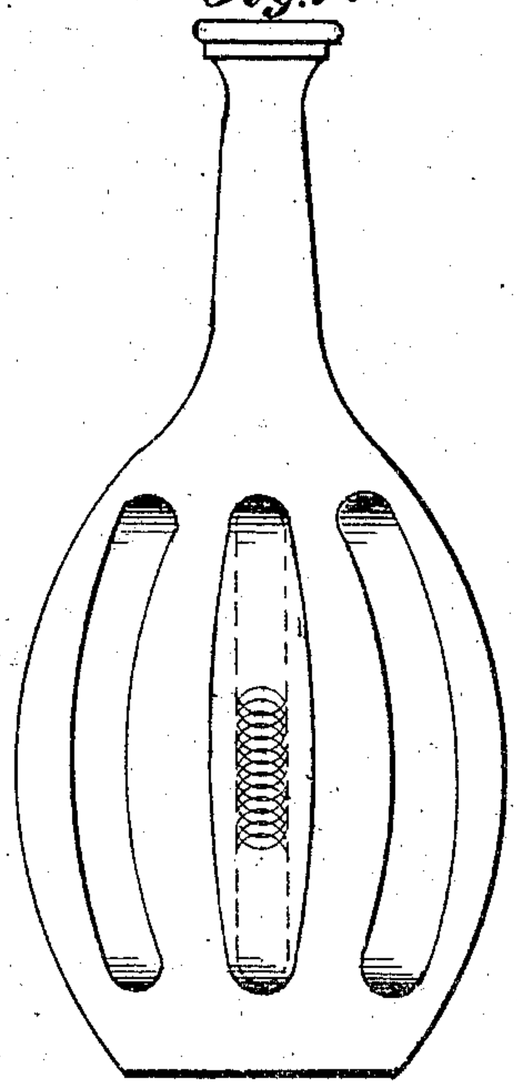


Fig. 10



Witnesses

W. Bradford

E. Edwd. J. Gibb

Inventor

H. A. Wassell

D. P. Holloway & Co

Attys.

UNITED STATES PATENT OFFICE.

HENRY A. WASSELL, OF STOURBRIDGE, ENGLAND.

IMPROVEMENT IN MACHINES FOR MARKING DESIGNS ON GLASS, &c.

Specification forming part of Letters Patent No. **135,610**, dated February 4, 1873.

To all whom it may concern:

Be it known that I, HENRY ADDENBROOK WASSELL, of Stourbridge, England, have invented a new and useful Machine for Marking Ornamental Patterns or Designs for Etching upon Objects of Glass or other Material.

The following description, taken in connection with the accompanying drawing hereinafter referred to, forms a full and exact specification, wherein are set forth the nature and principles of the invention, and the mode in which it is applied, together with such parts thereof as are claimed as new and are desired to be secured by Letters Patent of the United States.

My invention consists in certain devices and combinations of devices forming a machine for describing or marking ornamental patterns or designs upon the wax coating of wine-glasses, tumblers, jugs, decanters, and other objects in glass, to be afterward etched by what is known as the "acid" process; and the object of this invention is to do away with skilled hand-labor and other expensive processes for the same purpose, thereby reducing the cost of the manufacture and increasing the variety and quality of the ornamentation produced.

Figure 1 is a front elevation of a machine embodying my invention. Fig. 2 is a plan of section on the line *x x* drawn on Fig. 1. Fig. 3 is an elevation, showing that side of the machine which is at the right hand of Fig. 1. Fig. 4 is a separate view, in plan, of the arm marked D on the other figures, and showing more clearly the devices in connection therewith. Figs. 5 and 6 are two views of a device for attaching to the said arm for varying the movements to be described thereby. Fig. 7 is a perspective view, on a larger scale, of the needle-holder for holding two or more needles. Figs. 8, 9, 10, and 11 show to a larger scale several varieties of the patterns described by said machine.

A is the frame of the machine, which may be made of any suitable form or construction, and formed on the one side into one or more vertical members to act as guide-bars for the sliding piece B, which carries, in connection with the vertical spindle C, the horizontal or operating arm D, which may be fixed at any position radially on the spindle C as a center within certain limits, or may have any required radial motion thereupon. E is a short vertical mandrel or spindle which carries the horizontal disk *e*, upon which is placed the work or object *e'* to be operated upon, and to which is imparted a slow rotary motion by the train of change-wheels and pinions F F and pair of miter-wheels *f f'*, operated by the crank-handle G, or by any known motor by means of belt or pulley gearing. The vertical spindle C is operated by wheel *f'*, and itself carries a pair of bevel-wheels, *g g'*, either of which may be engaged with the bevel-wheel *h*, thereby operating the spindle H running along the operating-arm D. The sliding piece B, the arm D, and the reversing-bevels *g g'* are all movable up and down the spindle C, and may be fixed in any position for work by the set-screws, or may have a vertical reciprocating movement imparted by means of devices afterward to be described. Now, following the devices in connection with arm D, which carries the acting part of the machine, I is a bracket, carried upon a hollow spindle, *i*, running through bearings on the arm D, as shown, and which may be turned round into any angle with reference thereto, and set by screw-fastening. The spindle H runs through the hollow spindle *i*, and is operated by the bevel-wheel *g'*, before referred to, and in its turn operates the pair of bevel-wheels *h* h^1, and through the latter the wheel h^2, giving a rotary motion, when required, to the needle-holder by means of the parts now to be described. J is a hollow spindle mounted upon a light swivel-frame carried by the bracket I, and having sliding within it the stem *j*, which turns with the hollow spindle. The outer ends of the spindles are furnished with arms *i* i^1, operated by the handle *j'*, on which the arm *i* slides. i^2 is an elastic band, by which the stem *j* carrying the needle-holder is pressed inward against the work to be operated upon, and by which it is made to accommodate itself to any irregularities in the circular section of the object to be etched. The needle-holder may either be a light frame or arm carrying a single needle eccentric with the stem *j*, or may be made with two or more needles where a plurality of lines is required in the pattern; and in this case the needles are capable of a sliding movement, and are separately set up by elastic bands or springs, as shown, so that

all bear equally against any glass or other object circular on plan.

The foregoing description embraces the main parts of the machine, and the operation of the same so far will now be described, and afterward the various modifications of the parts to suit varying styles of work and patterns.

The glass to be operated upon, if of the tumbler or wine-glass variety, is placed mouth downward upon the disk *e*, and is held thereto by the stem K, swivel-pad *k*, and elastic band *k'*. The sliding piece B with operating-arm is then fixed at such a height as to correspond with that part of the glass upon which a border or device is to be etched, and the position of the arm radially placed so that the needle or needles of the needle-holder press sufficiently against the glass to cut away, when in motion, the film of wax with which the glass has been previously coated. The handle G is then turned, and a slow rotary movement is thereby given to the disk *e* and glass *e'* by the parts previously described, and at the same time the needle-holder, carrying either one or more needles, is rapidly revolved by the spindles C and H, together with the bevel-wheels and devices already described, the operation of which will be easily understood by one skilled in the art to which my invention appertains. In this way is performed the simplest and most elemental operation of the machine, and a border or pattern, which may be roughly described as consisting of a progressive series of circles of any diameter, is rapidly engraved upon the wax coating of the glass or other object, which is then ready for the acid-etching process. (See upper part of Fig. 8.)

Of course, by using two or more needles the lines of the pattern may be duplicated to any extent, and the width or thickness of the lines may be varied by the thickness and formation of the points of the needles or gravers.

The production of plain-line borders above and below the ornamental patterns or borders, as shown at the upper part of Fig. 8, may be effected at the same time by the application of an adjustable arm clamped to the frame of the machine in any convenient manner, and made to carry an adjustable needle-holder of the kind previously described, by which one or more needles may be made to operate against the glass or other object under treatment, the slow rotation of which will cause plain-line borders to be described at the same time as the principal pattern or design.

A device for producing patterns in general outline, like those shown in the lower part of Fig. 8 and in Fig. 9, is shown in Figs. 5 and 6, and consists of an arm, L, attached to the before-mentioned bracket I carrying the hollow spindle J. A rocking arm, M, carrying a needle-holder, is pivoted to the fixed arm L by means of the universal joint *m*, and is operated by a crank-pin from the spindle *j* moving in a slot, *m'*, in the said arm. The combination of the movements of the rocking arm and of the object to be operated upon produces the peculiar wave-like pattern above referred to. This may be further varied by an intermittent movement of the disk *e* (carrying the glass or other object to be etched) alternately with an intermittent movement of the rocking arm M. The intermittent movement of the disk *e* is given by revolving the handle G one or more revolutions at a time, forming the horizontal parts of the pattern; and after each movement of this kind the arm M is moved up or down by a backward and forward rotary movement by hand of the spindle *j* against a stop, thereby forming the vertical parts of the pattern, the needle-holder being set at an angle of, say, forty-five degrees to spread the lines equally each way. In this way may be produced patterns like that shown on Fig. 9. For further extending in a vertical direction patterns or designs of the wave-like type, and also patterns or designs running mainly in vertical and spiral directions—such as those shown in Figs. 10 and 11—the arm D, with all its devices, has given to it a vertical motion, reciprocating or otherwise, by the arrangements now to be described.

N N is a set of spur-gearing, operated by main handle G and working-spindle O, carrying the eccentric *o* and the drum and clutch o^1 o^2. The eccentric is connected by means of an adjustable pitman, P, with the sliding piece B carrying the operating-arm. The drum o^1 is connected, by means of chain *p*, balance-weight p^1, and pulley p^2, with the said sliding piece B. Both the movements are independent and engagable at will, the eccentric movement when engaged imparting a reciprocating vertical movement to the arm D and appurtenances, and the winding movement, when engaged by the clutch o^2 and lever o^3, giving a slow vertical movement for the whole working height of the machine, by which, in conjunction with a stop movement of the disk *e*, patterns in a vertical direction, as shown in Fig. 11, may be worked upon decanters, jugs, &c.; and by the same vertical movement, when taken in connection with an intermittent movement of the disk *e*, as before described, patterns of a spiral character, as shown in Fig. 10, may be worked upon articles of almost any shape.

The stop movement to the mandrel E and disk *e* may be of any of the known varieties, a disk with series of divisions and notches varying in number, and controlled by a spring-arm and stud, being that employed by me.

Two or more operating-arms, similar to that marked D, may be used in one machine and geared up by similar devices, so that two or more borders, patterns, or designs may be executed at one operation.

The patterns illustrated are simply typical of those most used, but an almost infinite variety may be produced by the machine.

It is obvious that the arrangements and details of the machine and of the various devices in connection therewith may be variously modified without departing in any way from the principles of construction underlying the whole; and I wish to be understood as includ-

ing any equivalent or analogous combinations or mechanical arrangements.

Having now described my invention, what I claim as new, and desire to have secured to me by the Letters Patent of the United States of America, is—

1. A machine, constructed substantially as hereinbefore described, and for the purposes set forth, in which the object in glass or other material to be operated upon preparatory to etching is placed and worked in a vertical position.

2. The radial or operating-arm D, with its universally-jointed bracket I and needle-holder, together with the spindles C, H, and J, and sliding stem *j'*, by which the said needle-holder may be fixed or adjusted and operated at any diameter or at any angle to suit objects of a spherical or other shape.

3. The needle-holder, as shown, with its adjustable needles operated by elastic bands to press and act equally upon any irregular or rounded surface.

4. The device, shown in Figs. 6 and 7, for producing wave motion.

5. The devices for producing reciprocating or continuous vertical movement, consisting of eccentric *o*, and drum and clutch o^1 o^2, and draw-chain connection, which, in combination with the rotary and stop movements of the object to be etched, produce vertical and spiral patterns.

6. The devices for holding glass or other objects on the operating-disk *e* without clamps, consisting of the swivel-pad *k*, sliding stem K, and spring *k'*, with pulley and cord, as shown, for lifting the pad when changing the work.

In testimony that I claim the foregoing I have hereunto set my hand this 24th day of October, 1872.

HENRY ADDENBROOK WASSELL.

Witnesses:

JOHN MILLWARD,

ALFRED ATKINS.