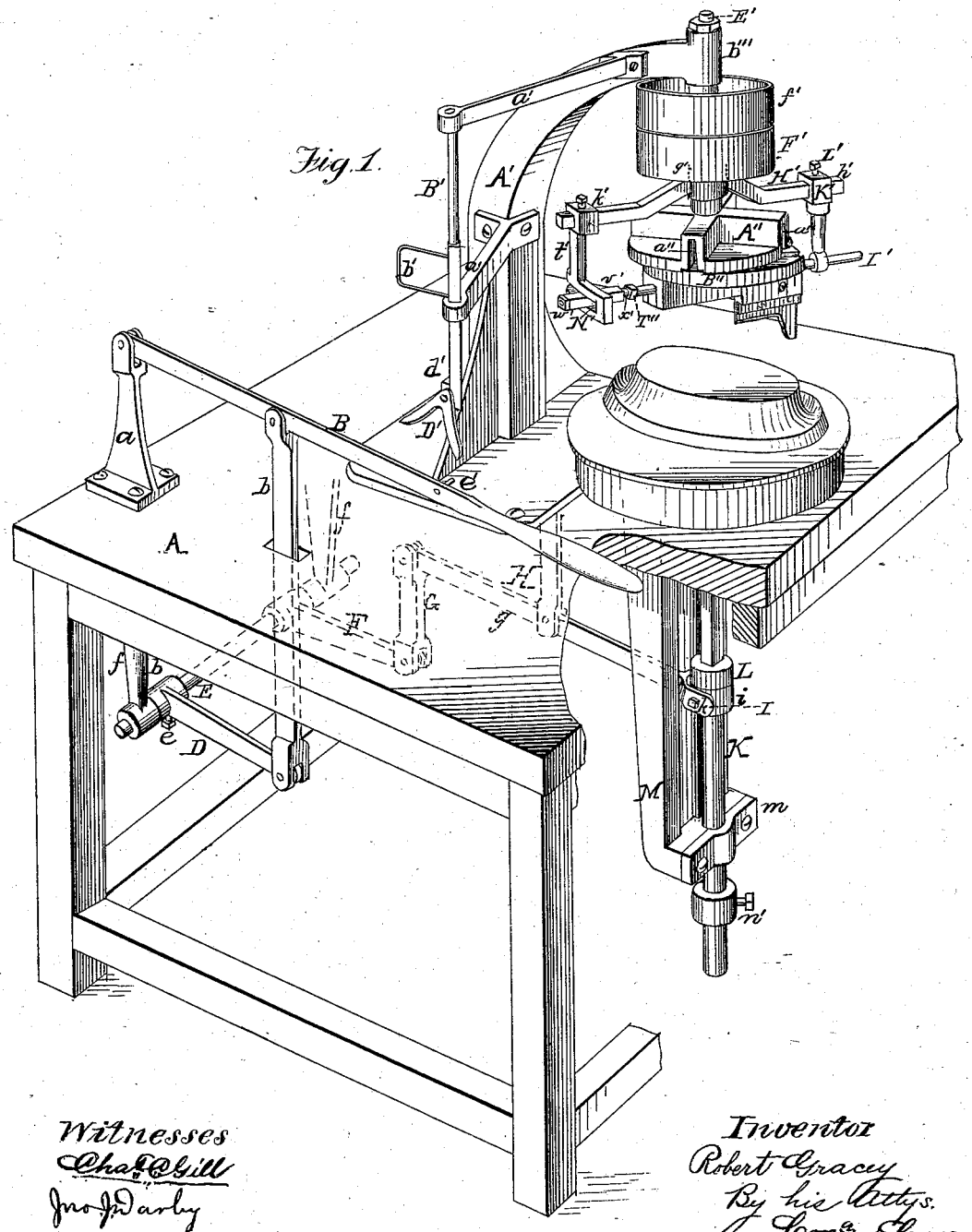
2 Sheets—Sheet 1.

R. GRACEY.

MACHINERY FOR THE MANUFACTURE OF POTTERY.

No. 192,823. Patented July 10, 1877.

Fig. 1.



Witnesses
Chas. C. Gill
Jno. J. Darby

Inventor
Robert Gracey
By his Attys.
Cox and Cox

2 Sheets—Sheet 2.

R. GRACEY.

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Fig. 2.

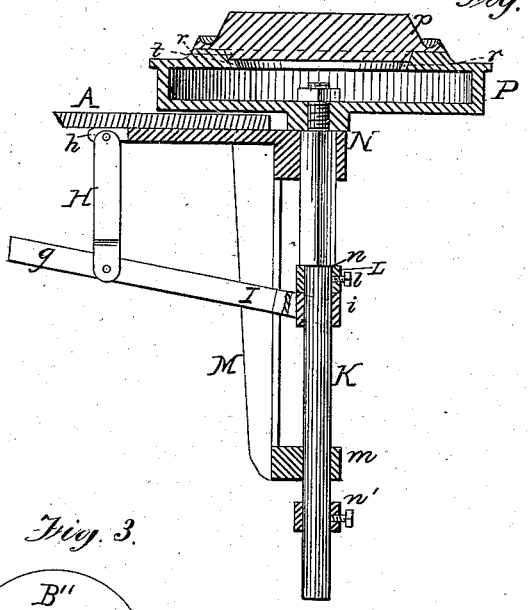


Fig. 6.

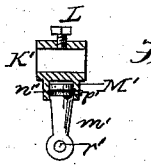


Fig. 3.

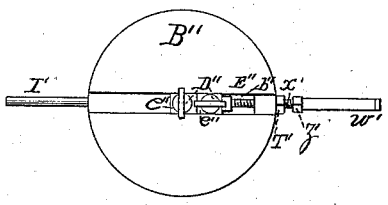


Fig. 5.

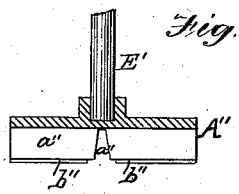
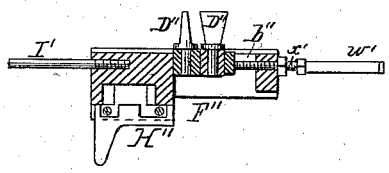


Fig. 4.



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UNITED STATES PATENT OFFICE.

ROBERT GRACEY, OF EAST LIVERPOOL, OHIO, ASSIGNOR TO HIMSELF AND WILLIAM L. GRACEY, OF SAME PLACE, AND CHARLES M. FAIRMAN, OF PITTSBURG, PENNSYLVANIA.

IMPROVEMENT IN MACHINERY FOR THE MANUFACTURE OF POTTERY.

Specification forming part of Letters Patent No. **192,823**, dated July 10, 1877; application filed March 16, 1877.

To all whom it may concern:

Be it known that I, ROBERT GRACEY, of East Liverpool, in the county of Columbiana and State of Ohio, have invented a new and useful Improvement in Machinery for the Manufacture of Pottery, of which the following is a specification, reference being had to the accompanying drawings.

The invention relates to an improved machine for the manufacture of oval ceramic ware or pottery.

It consists in the devices, hereinafter fully described, through which an elliptic or oval movement is given to a tool secured to a movable support, to which motion is imparted, and which is adjustable with relation to the mold or jigger-head.

The object of this invention is to supply a machine whereby oval ware can be formed independently of manual manipulation.

Figure 1 is a perspective view of a device embodying the elements of the invention. Fig. 2 is a central vertical section of the jigger-head, its shaft, and connections. Fig. 3 is a top view of the plate B″. Fig. 4 is a central vertical section of same. Fig. 5 is a like view of the trammel-plate, and Fig. 6 is a similar view of the slide K′.

In the accompanying drawings, A represents a table or platform, suitably sustained by the legs and braces, as shown, a proper distance above the floor or other supporting-surface.

Upon one side of this platform, with its handle in convenient relation to the front of the machine, is provided the lever B, the rear end of which is pivoted in the upper end of the standard *a*, in front of which there is pivoted to the lever B the upper end of the draw-bar *b*, which extends downward through an aperture in the platform, having its lower end pivoted to the front end of the arm D, the rear end of which is provided with a sleeve, *d*, and set-screw *e*, to secure it upon the shaft E, working in bearings in the dependent standards *f*, secured to the under side of the platform.

Opposite the arm D there is similarly secured to the shaft E another arm, F, the front end of which is pivoted to the lower end of a link, G, the upper end whereof is similarly connected with the rear end of the lever *g*, working on an oscillating fulcrum-arm, H, the upper end of which is pivoted between the ears *h* on the rear end of an iron plate secured to the table; or the arm H may be connected in any other manner with the platform, so that it shall be capable of an oscillatory movement from front to rear, the object being to prevent the movement of the lever *g* deflecting any of its attachments.

The front end of the lever *g* is provided with the fork I, which partially encompasses the collar *i* on the jigger-shaft K, the fork being connected, by the pivot-screws *k* on each side, with the collar, which pivots may be worked in, and operated as set-screws, fixing the position of the collar *i*, and operating both as pivots and set-screws, or may be worked out, and then operate as pivots only. Thus the position of the collar *i* on the shaft K is determined. The elevation of the shaft is further regulated by the sliding collar L, having the set-screw *l*. The purpose of these adjusting devices is to regulate the position of the jigger-head, and thus determine the thickness of the ware being formed on the jigger-head.

The shaft K stands vertically, its lower end passing through an aperture in the step *m* at the base of the double hanger M, through which the front part of the lever *g* extends. The upper part of the shaft K, being angularly formed, passes a corresponding aperture in the front of the plate N, which is secured in the platform A, and forms the support of the hanger M. This gives the shaft a fixed vertical position, and still permits it to be elevated or depressed.

The elevation of the collar L is determined by the shoulder *n* of the angular formation on the opposite parts of the shaft K, which, below the step *m*, is provided with a third collar, *n′*, the elevation of which is determined by the step, and which further assists in regulating the elevation of the shaft.

From the above it is plain that the shaft cannot be unduly raised, and, further, that the pivoted connection of the lever *g*, hung on an oscillating fulcrum, avoids any danger of

the shaft being deflected while being elevated.

The plate N is secured in an aperture in the platform, to the front portion of the base of the standard carrying the forming mechanism; but it is obvious that many other expedients of strictly analogous construction may be employed to effect the purpose of the plate N and hanger M, which is simply to secure the shaft K in an upright position, and yet to allow its vertical movement.

The angular portion of the shaft K extends above the platform A, and there is secured at its upper extremity the jigger-head P, provided with an aperture to receive the mold *p*, which is retained in place on each side by lugs *r*, which fit into the notches *t* in the mold.

At about the center of the platform A is secured the base of the standard A′, the upper end of which projects forward a suitable distance. Two arms, *a′*, project upon one side of the standard, the upper having a circular, the lower an angular, aperture, to receive and retain the belt-shifter B′, which is constructed circular in its upper, and angular in its lower, parts, and, midway between the arms *a′* is furnished with the loop or bar *b′*, over which the belt passes. The lower end of the shifter has a projecting arm, *d′*, on the extremity of which is pivoted the crank-lug D′, which receives at its re-entrant angle a pin or stud, *e′*, on the lever B. This shifter is so arranged that, when the lever B is depressed, which throws the jigger-head into the operative position, the loop *b′* shall be directly opposite the belt-wheel F′ that gives motion to the forming mechanism; and also so that when the lever B is elevated, which throws the jigger-head out of operative position, the loop *b′* shall be opposite the loose relief belt-wheel *f′*, thus checking the motion of the forming mechanism.

Thus the movement of the lever both elevates the jigger to operative position and places the belt, or depresses the jigger-head and removes the belt.

The front of the standard A′ projects over the jigger-head, and is furnished with the sleeve *b‴*, which receives the upper end of hanger E′, all so arranged that the axial centers of the jigger-shaft K and the hanger E′ are coincident. Upon the hanger E′ and below the sleeve *b‴* is mounted the loose belt-wheel *f′*, and below this on the hanger is mounted the belt-wheel F′, to the lower central parts of which is rigidly secured the upper end of the dependent sleeve-axle *g′*, which rotates with the wheel F′ on the hanger E′. The sleeve *g′* is above the crown H′, from which, on opposite sides, extend the angular arms *h′ k′*, the arm *h′* being furnished at its outer portions with the angular loop or slide K′, movable upon the arm *h′*, and adjustable thereon by means of the set-screw L′. To the lower side of this slide is secured the hollow stud M′, which receives the end of the hanger *m′*, which is reduced to enter the stud, and is furnished with the annular slot *n″*, the sides of which are inclined to the base of the slot as an apex, this slot separating as a guide on the parts of the pin *p′* which cross the stud diagonally, and are conformed to suit the superficies of the slot. Thus the hanger *m′* can have a certain circular movement, and at the same time a slight lateral play, but all other motion is prevented. The end of the hanger is provided with an aperture, *r′*, which receives and supports the end of the arm I′, the arm being of such size as to move readily in the aperture *r′*, and having its inner end secured to the plate B″.

The arm *k′* is also provided with an adjustable angular slide, K′, to which is connected the hanger *t′*, which terminates in the curved bar *v′*, having in it the extended slot N′, which receives the sleeve *w′*, secured so as to rotate on the axle *x′*, and projecting beyond the slot. The axle *x′* has a square shoulder, *z′*, at the end of the sleeve *w′*, beyond which the axle is threaded, passing through a nut, T′, and thence into the cavity *b″* of the trammel-plate B″ through a block at its end, the inner end of the axle serving to clamp the bases of the shuttles D″.

The purpose of this construction may be thus stated: The slot N′ serves to permit the oscillation of the arm or axle *x′* as the plate carrying the forming-tool moves, and the sleeve *w′*, while sustaining, allows the axle *x′* to rotate, and permits its being screwed toward or from the shuttles. The shoulder *z′* prevents the sleeve being moved toward the plate, and thus the axle may be operated as a clamp for the shuttles, while nut T′ assists in securing the axle in its clamping position.

To the lower end of the hanger E′ is secured the trammel-plate A″, which is traversed by two grooves or slots, *a″*, crossing each other at right angles at the center of the plate. These grooves have their sides correspondingly inclined upward and inward. At their bases on each side are formed the small recesses *b″*.

Below the plate A″ is placed the plate or platform B″, sustained in proper position by the support of the arm I′, and the axle *x′* encompassed by the sleeve *w′* on opposite sides of the plate. The platform B″ is provided with the recess or cavity *b″*, in which is placed the angular bases *e″* of the shuttles D″, which are attached to the upper parts of the bases *e″*, so as to rotate thereon. The upper parts of the shuttles D″ are wedge-shaped to conform to the sides of the grooves *a″*, wherein they move freely, one shuttle in each groove.

A chock, E″, is provided, which may be used to separate the bases *e″*, thus enlarging the distance between them, or the distance between either or both from the edge or center of the plate B″, thus regulating the orbit of the tool.

Upon the under side of the plate B″ is provided the ridge F″, on which is secured the

base of the forming-tool H″, which may be of any desired outline. The centers of the jigger-shaft and of the plates A″ and B″ are coincident.

Now, it is obvious that motion being imparted to the belt-wheel F′, the arms *h′* and *k′* will be rotated, causing the plate B″ to move, and the shuttles D″ being in the grooves *a″* in the fixed trammel-plate A″, and being capable of rotary movement on their bases *e″*, an elliptical movement will be imparted to the plate B″, and accordingly to the tool H″ on its under side.

The clay being now placed upon the mold *p*, and it placed upon the jigger-head P, it is only necessary to depress the lever B, which elevates the jigger-shaft K, and with it the jigger-head and mold to a proper position, whereat the now rotating tool H″ operates upon the exterior of the clay on the mold, giving it an oval or elliptical form.

It is obvious that the same process can be applied with equally good results to forming the interior of the ware, the mold being of suitable shape to give the exterior form.

It will be remarked that in the above operation the jigger-head is stationary, while the trammel-plate and tool revolve, but it is obvious that an elliptical movement could be imparted to the jigger-head, and the tool remain stationary, though the present form of mechanism is believed to be the more practicable.

What I claim as my invention, and desire to secure by Letters Patent, is—

1. In a machine for forming pottery, a jigger-shaft operated by a pivoted lever hung on an oscillating fulcrum, substantially as set forth.

2. In a pottery-machine, a lever hung on an oscillating fulcrum, and pivotally connected with a jigger-shaft provided with movable collars for determining its position, as set forth.

3. The lever *g*, provided with the fork I, and hung on the oscillating fulcrum H, in combination with the collar *i*, substantially as and for the purpose specified.

4. In a pottery-machine, a jigger-shaft having a fixed vertical movement, and provided with collars and set-screws to secure its vertical adjustment, substantially as shown and described.

5. A pottery-machine in which the movement of a lever simultaneously removes the jigger-head from operative position, and displaces the motor actuating the forming mechanism, as set forth.

6. A pottery-machine, in which the device driving the forming mechanism is removed, and the jigger-head lowered out of operative position by the movement of a lever, as set forth.

7. The adjustable slide K′, provided with a hanger having a pendulous movement, in combination with arm I′, substantially as expressed.

8. The stud M′, provided with the pin *p′*, in combination with the hanger *m′* and arm I′, as set forth.

9. The hanger *t′*, provided with the bar *v′*, having the slot N′, in combination with a bar for supporting the plate B″, as set forth.

10. The sleeve *w′*, for the purpose specified.

11. The sleeve *w′*, in combination with the threaded axle *x′*, for the purpose set forth.

12. In a machine for making pottery, a tool having an oval movement, substantially as set forth.

13. In a machine for making pottery, a tool having an oval or elliptical movement, in combination with an adjustable jigger-head, substantially as set forth.

In testimony that I claim the foregoing improvement in machinery for the manufacture of pottery, as above described, I have hereunto set my hand this 20th day of December, 1876.

ROBERT GRACEY.

Witnesses:
W. A. HERRON,
W. W. CAMP.