



HENRY B. MORRIS.

Improvement in Potters' Lathes.

No. 126,318.

Patented April 30, 1872.

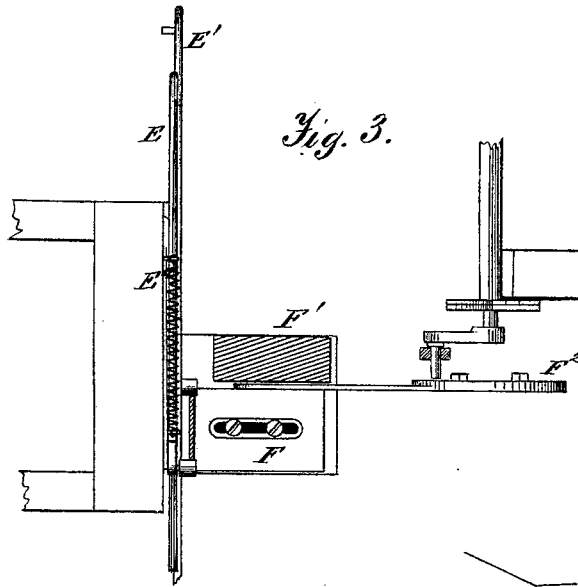


Fig. 3.

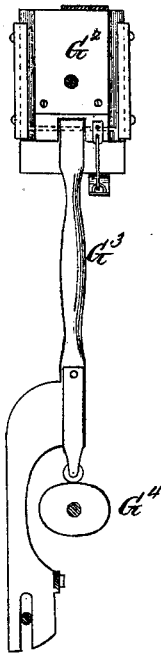


Fig. 4.

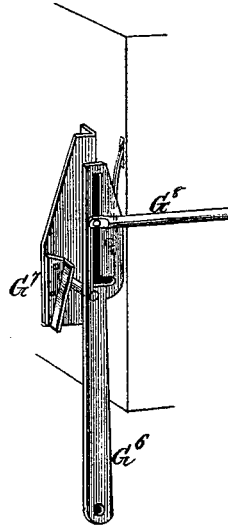


Fig. 5.

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## IMPROVEMENT IN POTTERS' LATHES.

Specification forming part of Letters Patent No. 126,318, dated April 30, 1872.

Specification describing certain Improvements in Potters' Lathes, invented by HENRY B. MORRIS, of Burlington, in the county of Burlington and State of New Jersey.

This invention relates to that class of devices which are denominated potters' lathes; and it consists in certain improvements which will be more particularly described hereinafter.

Figure 1 is a side view of my improved lathe, showing the frame to which the operating parts are attached, the gearing for operating it, the belt for bearing any of the finished articles, the pulleys for giving motion to such articles while being formed, a sliding head which carries the forming-fingers, and a cam which operates said fingers. Fig. 2 is a view partly in section and partly in elevation, the section-line being indicated at *xx*, Fig. 1, there being shown in the figure a portion of the frame, the position of the forming-fingers upon the sliding head, the cam and spring which give the horizontal movement to said fingers, the rotating table which gives motion to the article which is being formed, the stationary table with a former attached to it, and the mechanism for giving motion to such table when it is converted into an oscillating one, or when it has motion imparted to it. Fig. 3 is a plan view of a portion of the shaft which carries a crank for giving motion to the sliding head to which the fingers are attached, and which also move the cam which operates said fingers, the position of the fingers being shown. Fig. 4 is a detached plan view of the table to which the former is attached, the connecting-rod which moves it, and the cam for giving it motion when desired. Fig. 5 is a perspective view of the mechanism for connecting the sliding head to the connecting-rod shown in Fig. 4.

Corresponding letters refer to corresponding parts in the several figures.

In constructing machines of this character, I use any suitable frame-work, A, it being constructed substantially as shown, or in any manner that will cause it to receive and retain in their proper positions the operating or moving parts of the mechanism, A' being an extension of said frame for holding in position a lever or beam soon to be described. In suitable bearings upon the frame A there

is placed a driving-shaft, B, to the outer end of which there may be attached a crank when the machine is to be propelled by hand, or a pulley or gear-wheel when it is to be driven by a motor. Upon the shaft B there is placed a pinion, B<sup>1</sup>, which meshes into a spur-wheel, B<sup>2</sup>, which is placed upon a shaft, C, said shaft being so located that a crank, C<sup>1</sup>, upon its inner end shall operate a connecting-rod, C<sup>2</sup>, and through it a lever or beam, C<sup>3</sup>, and another rod, C<sup>4</sup>, for the purpose of giving a vertical movement to the sliding head D, which is so constructed and arranged as to move upon vertical rods in the frame and between the vertical portions of said frame. Attached to horizontally-moving slides working in grooves formed in the sliding head D are two fingers, E E', which extend in two directions for such a distance as to cause one of the ends of the one, E, to come in contact with the interior or inner side of a former, G', while its opposite end extends in the other direction far enough to cause a downwardly-projecting arm upon its end to enter and form a hole or aperture in any lump of clay that may be placed upon a rotating table provided for that purpose, at the same time that an arm projecting from the one E<sup>1</sup> rests upon the outer surface of the former G', and an arm upon its opposite end bears upon the outer surface of the clay, and thus, in conjunction with the projection on or from finger E, gives form thereto. Upon the rod or finger E there is fixed an anti-friction roller, E<sup>2</sup>, and upon the rod or finger E<sup>1</sup> a similar roller, E<sup>3</sup>, they being so disposed horizontally that, as the cross or sliding head D descends, one of the rollers shall follow down upon one of the surfaces of a cam soon to be described and the other upon its opposite surface. In addition to the rollers the rods or fingers have attached to them springs E<sup>4</sup> and E<sup>5</sup>, which serve to draw the downwardly-projecting parts of the fingers toward each other, and to keep the parts thereof which are over the former in close contact therewith while the sliding head and the fingers are rising, and consequently while the lump of clay upon the rotating table is formed into a vessel.

In order that the fingers above referred to may have the proper horizontal movement imparted to them, and at the proper time, a cam, F, such as shown in Fig. 2, is provided, which

is placed upon a sliding platform,  $F^1$ , the whole being moved in a direction at a right angle to the horizontal line of movement of the fingers by a plate of metal,  $F^2$ , which is attached to the platform  $F^1$ , its opposite end being of the form shown, in order that it may have studs placed in it for the purpose of allowing the crank-pin of crank  $C'$  to come in contact with them, and thus withdrawing the cam  $F$  from its contact with the rollers at the moment when the fingers begin to ascend, and of returning it to contact therewith when they begin to descend, so that when the fingers are ascending they may be in contact with the former and with the clay which they are forming, and that in descending they may be free from such contact. Should it be found necessary, for the purpose of facilitating the formation of the vessel, or for the purpose of leaving a smooth surface thereon, the ends of the fingers which are in contact with such vessel may have attached to them rollers whose surfaces alone shall be in contact with said vessel.

In order that the proper form—which may be any one that is usually given to vessels made of potters' clay—may be given to the vessel, a table or platform,  $G$ , is located directly under the ends of the fingers which are opposite the ones which give form to the vessels; and this table has secured to its upper surface a vessel,  $G'$ , of the form which it is desirable to give to the new one, or it may be a section of such a vessel such as is shown in the drawing, it being apparent that the action of the springs will keep the fingers in close contact with the former when they are rising, and that as a consequence the opposite ends thereof will give the same form to the clay upon the table which rotates it. In order that a rotary motion may be imparted to the clay or earth to be manipulated a large spur-wheel is attached to the driving-shaft  $B$  at its inner end, which wheel meshes into a pinion on a counter-shaft, upon the opposite end of which there is a pulley over which a belt passes, and from which it extends to and around a pulley,  $H$ , upon a vertical shaft, upon the upper end of which there is placed a rotating table,  $H^2$ , which gives motion to the rotating pulleys or platform  $H^4$ , the latter being secured to a belt,  $H^3$ , by means of a strap of metal extending across an aperture formed in said belt, the rotating pulleys or platforms  $H^4$  consisting of two disks of metal, which are united by a shaft or pin, which has its bearing in the strip of metal alluded to, the whole being so arranged that when the belt  $H^3$  is moved so as to bring one of the rotating pulleys or platforms over the center of the rotating table  $H^2$  it will receive from  $H^2$  a rotary motion; and as it is designed that the clay or other material to be formed shall be placed upon the center of  $H^4$  it follows that the clay or earth will have a rotary movement, it being prevented from standing still upon the pulley, or, in other words, made to rotate with it by means of short pins inserted into the upper surface of the pulley, or

by having the said surface roughened for that purpose. When the material has been placed upon the pulley or platform it is intended that its weight and the downward pressure of the fingers, which in descending form a hole in the center of the mass, shall press the lower disk of the platform upon the table  $H^2$  with sufficient force to insure the rotation of the pulley or platform, and with it the material which is placed upon it. It is intended that this machine shall be capable of bearing off or away the articles after they have been formed, and for this purpose an intermittent movement is to be imparted to the belt  $H^3$  and its pulleys  $H^4$  by means of a lever operated by the crank  $C'$ , or by a cam upon the driving-shaft, or in any other suitable manner, it being so arranged that when the lump of clay or material which is upon the rotating pulley or platform is being formed the belt shall be in a state of rest, and the clay may at such time be forced through a hopper terminating in a pipe upon one of the pulleys  $H^4$ , the quantity deposited being regulated by the movements of a knife at the end of said pipe so arranged that when the requisite quantity has been placed thereon it shall be cut off, and upon the next movement of the belt be carried under the fingers to be formed, and at the same time the finished vessel will be borne away to a position where it will be convenient to be carried to the point where it is to be dried. This belt passes over the proper pulleys or rollers for the purpose of keeping it in position, the larger one of which is designated  $H^5$ .

The above-described method of turning or forming vessels having regular or irregular forms, namely, by the use of a perfectly-formed pattern placed upon the table  $G$ , which in this case should be made to rotate by means of a belt extending from the pulley on the under side of table  $H^2$  to a pulley upon its shaft,  $I$  regard as the most convenient and practical one; but the same may be accomplished by making the table  $G$  stationary by means of the devices shown in Fig. 2, or in any other manner, and giving to it a reciprocating movement by means of cams, or a former,  $G$ , placed upon a vertical shaft and driven by a belt from a pulley upon the shaft, which rotates the table  $H^2$ , motion from this former being communicated to the table  $G$  by means of a connecting-rod,  $G^3$ , which has, in that end of it which is in contact with the cams or former, one or more rollers, as shown in Fig. 2, so that the oscillating movement may be given to the rod  $G^3$ , and through it to the bed  $G^2$  and the table  $G$  which rests upon it, in which case as the fingers are made to grasp the former  $G^1$  in ascending the movements of the table and the former upon it—which in this case will be a straight piece of metal of the proper length—will be imparted to the fingers, and as a consequence the desired form will be given to the vessel which is being formed. In order that the rollers in the con-

necting-rod G<sup>3</sup> may be caused to travel over the different parts of the former a rod, G<sup>6</sup>, is fastened to it, the upper end of which is provided with a slot, in which a pin works, which is made fast to an arm which is secured to the sliding head D. At the lower end of this slot another at a right angle to the vertical one is formed, so that when the head D is at its lowest point the pin will enter the last-named slot, and as the head rises the arm upon such head will carry up with it the rod G<sup>6</sup> and the connecting-rod G<sup>3</sup>; and thus the movements consequent upon the shape of the different parts of the frame will be imparted to the fingers. In order that when the head D, and consequently the fingers, have reached the highest point the connecting-rod G<sup>3</sup> may be allowed to fall, a cam, G<sup>7</sup>, is attached to the frame, which, as rod G<sup>6</sup> rises, will come in contact with it and release it from the pin in the arm upon head D and permit it to fall, so that in descending the fingers shall not be in contact with the vessel which is being formed. When the vessel is to be formed by a rotary movement of the table G the arm G<sup>6</sup> is to be disconnected from the rod G<sup>3</sup>.

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

1. The fingers E E<sup>1</sup>, constructed and arranged to operate substantially as and for the purpose set forth, whereby one of their ends is made to grasp the form during a portion of the time in which they are moving vertically, and their opposite ends to grasp the vessel which is being formed during the same time.

2. I claim the combination of the fingers E E<sup>1</sup> and sliding head D, substantially as and for the purpose set forth.

3. I claim the combination of the fingers E E<sup>1</sup>, the cam F, and the springs E<sup>4</sup> and E<sup>5</sup>, they being arranged with reference to each other, substantially as set forth, whereby the downwardly-projecting arm of E can be used to form an aperture in the center of the mass of material out of which the vessel is to be formed.

4. I claim the table G and its former, in combination with the fingers E E<sup>1</sup>, substantially as and for the purpose set forth.

5. The combination of the intermittently-moving belt with the revolving-table of a potter's lathe, substantially as and for the purpose set forth.

6. I claim the rotating-pulleys or platforms placed in the intermittently-moving belt, substantially as and for the purpose set forth.

7. I claim the combination of the cam G<sup>4</sup>, connecting-rod G<sup>3</sup>, table G, form G<sup>1</sup>, arm G<sup>6</sup>, cam G<sup>7</sup>, and sliding head D, the parts being constructed and arranged to operate substantially as and for the purpose set forth.

In testimony whereof I have signed my name to this specification in the presence of two subscribing witnesses.

HENRY B. MORRIS.

Witnesses:

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W. H. CLIVER.