J. S. Brown.

Turning Lathe.

No. 9,092. Patented Jul. 6, 1852.

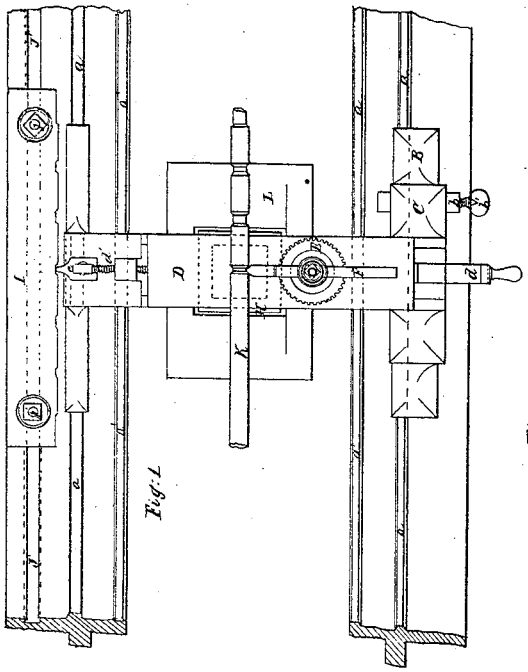

Fig. 1.

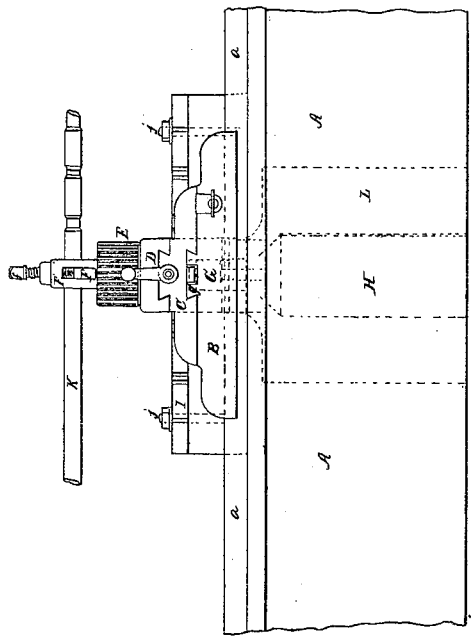

Fig. 2.

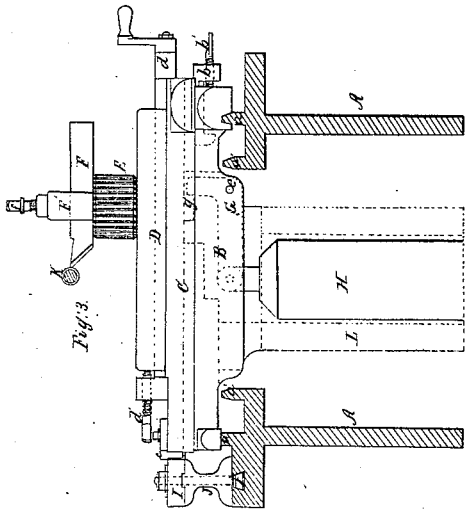

Fig. 3.

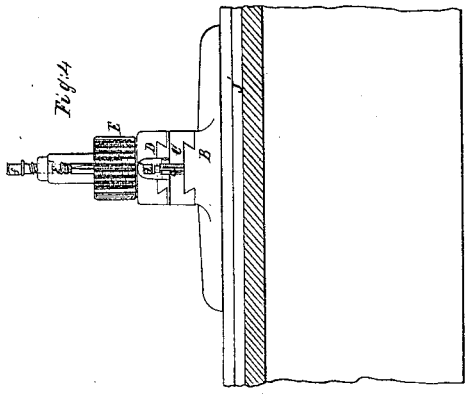

Fig. 4.

THE GRAPHIC CO. PHOTO-LITH. 39 & 41 PARK PLACE, N.Y.

UNITED STATES PATENT OFFICE.

JAMES S. BROWN, OF PAWTUCKET, MASSACHUSETTS.

TURNING-ENGINE.

Specification of Letters Patent No. 9,092, dated July 6, 1852.

To all whom it may concern:

Be it known that I, JAMES S. BROWN, of Pawtucket, in the county of Bristol and State of Massachusetts, have invented certain new and useful Improvements in the Construction of Engine-Lathes; and I do hereby declare that the following is a full, clear, and exact description of the construction and operation of the same, taken in connection with the accompanying drawings, making part of this specification, in which—

Figure 1 is a plan of the slide rest and its appendages, with a part of the bed of the lathe; Fig. 2 is a front elevation of the same; Fig. 3 is a side elevation of the same with the bed in section; and Fig. 4, is an elevation of the back end of the rest; which represent those parts of the engine lathe to which my improvements pertain.

The first part of my invention relates to certain modifications of the slide rest ordinarily used with the engine lathe; by which, in connection with other devices it is adapted to the turning of bodies, longitudinally in a great variety of forms, with straight or curved surfaces or straight and curved surfaces combined; and consists, in introducing into the slide rest, an additional sliding piece or other equivalent device by which the cutting tool has a motion transversely to the lathe, independent of the transverse motion by which it is worked and adjusted by hand; which transverse motion is given to it by a pattern bar, against the guiding surface of which the additional sliding piece bears. This additional sliding piece is further provided with a contrivance by which the combined action of the pattern bar and slide can be arrested when required; so that the machine will operate like the ordinary slide rest, and turn a straight surface without changing any other part of the mechanism.

The second part of my invention relates to an improved method of adjusting the height of the cutting tool to its work; and consists in the application to the standard of the slide rest which holds the tool, of a cylindrical nut, which screws up and down upon the standard, and upon which the tool rests for its support; being held down upon it by a set screw in the usual way.

The letters of reference in the drawings refer to like parts in all the figures.

A, A, is the bed of the lathe, *a*, *a*, being the slides or ways upon which the rest moves, and *a'*, *a'*, the ways upon which the head stock slides; which is not represented as it is not modified by my improvements.

B is the lower piece or saddle of the rest which slides upon the ways in the usual manner.

C is a slide which is attached to the saddle B by a dovetail as shown, which permits the slide to traverse longitudinally upon it and transversely to the lathe. Upon the back end of the slide C is a cog or projection *c* which is made to bear against the edge of the pattern bar I, and is kept firmly in contact with it by the action of the weight H acting upon the slide C through the bent lever G as shown in dotted lines in Figs. 2, and 3. The lever G hangs in the saddle B upon the pin *e* as a fulcrum.

From the long arm of the lever the weight H is suspended, and the short arm of the same bears against the projection *g* upon the under side of the slide C, (as shown in dotted lines in Figs. 2 and 3.) and forces the slide C and its appendages toward the pattern bar with a force proportionate to the weight and leverage employed. To the other end of the slide C is attached the clamp *b* which embraces a part of the saddle B as shown, and is provided with a set screw *b'* by means of which the slide may be drawn back so that the cog *c* shall not come in contact with the pattern bar I, but will be fixed to the saddle B and move with it; in which case the rest may be used to turn straight surfaces, when it will operate like the ordinary slide rest.

D is the slide which carries the tool and is fitted by a dovetail to the slide C as shown and is made to traverse thereon by the screw *d* in the usual manner. *d'* is a stop which is sometimes used to gage the size of the piece to be turned. E is a cylindrical nut which screws upon a boss or standard upon the slide D, (as shown by the dotted lines), upon which the tool F rests, and by turning which the tool may be adjusted to the proper height. The tool is held firmly upon the nut E by the holder F' and set screw *f* in the usual manner. The circumference of the nut E is fluted or otherwise roughened for the purpose of turning it by the hand. The pattern bar I is made with the edge thereof against which the cog C bears, of the exact longitudinal form required to be given to the surface of the piece to be turned; and

the edge of the finishing tool is made with the same horizontal outline as the extremity of the cog *c;* so that as the slide rest is moved along past the pattern bar, the edge of the tool describes a line exactly corresponding to the form thereof, and therefore reproduces, upon the piece to be turned, the same longitudinal configuration of surface. The pattern bar I is mounted upon a bearer or pedestal J and is secured to the bed of the lathe by the bolts *j*, which have dovetail heads which are made to fit the groove J′ which extends the entire length of the ways; so that by loosening the nuts of the bolts, the pattern bar and its pedestal may be slid along to any required position and again fixed; or by removing the nut, another bar of any required form may be substituted with facility. The weight H which presses the slide C toward the pattern bar, is not made sufficiently heavy to hold the rest firm upon its ways and therefore an additional weight L is attached to the saddle (as shown by the blue lines in Fig. 3 and in plan in Fig. 1) which is made to surround the weight H, but independent of it. When the rest is held down to the ways by a dovetail, as is sometimes done, the weight L would not be required. *k* represents a piece in the process of turning which in this instance is a section of drawing rollers for a cotton spinning frame; which serves to show the relation between the pattern bar and the tool, and their application to the piece to be turned.

The operation of the machine is as follows: The piece to be turned is put into the lathe in the usual manner and a pattern bar of the required form is placed upon the pedestal J. The bar is then slid along until any given point thereof is exactly opposite a corresponding point upon the piece. The bar is then fixed firmly by screwing up the bolts *j*. The tool F is then set by screwing the nut E up or down upon its standard so that its cutting edge shall be exactly level with the center of the piece so that any transverse movement of the tool shall be exactly radial thereto; otherwise the surface turned by the tool would be distorted and not like the pattern. For the same reason it is also necessary that the cutting edge of the tool should always be presented to the piece at precisely the same angle; both of which objects are attained by the use of the nut E as described. The lathe is then put in motion and by means of the hand screw *d* the tool is set to cut the piece to the required diameter in the usual manner. The feeding apparatus is then put in gear and the tool as it is moved along to cut off the redundant material, receives a transverse motion from the pattern bar as already described, corresponding to the form required to be wrought. This method is adapted to turning all cylindrical forms when the angle formed by the surface longitudinally with the axis is not so great as that the cog *c* cannot be made to slide over it as the rest is moved along. It is applicable to the turning of drawing rollers for spinning frames, connecting rods, handles, and a variety of similar objects which would readily suggest themselves to the mechanic.

What I claim and desire to secure by Letters Patent is—

The clasp *b* in combination with the slide C and saddle B for the purpose of arresting the combined operation of the slide C and pattern I when required. And I also claim the cylindrical nut E in combination with the standard and toolholder F′ of the slide rest, as described, by which the edge of the tool is brought to the proper position to coöperate with the pattern bar and slide rest substantially as is herein set forth.

April 17, 1852.

JAMES S. BROWN.

Witnesses:
BENJA. GRIDLEY,
THOMAS R. KING.