

H. H. BEMIS.
LATHE FOR TURNING LASTS.

No. 276,129.

Patented Apr. 17, 1883.

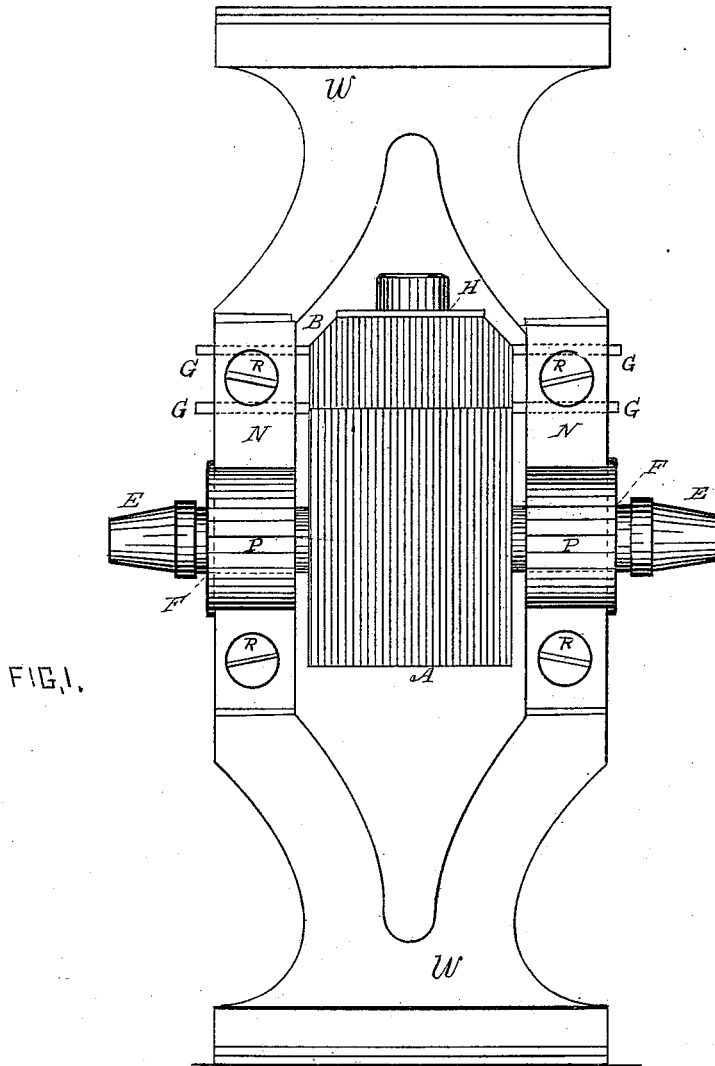


FIG. 1.

WITNESSES
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(Model.)

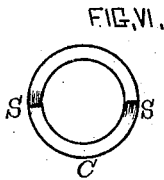
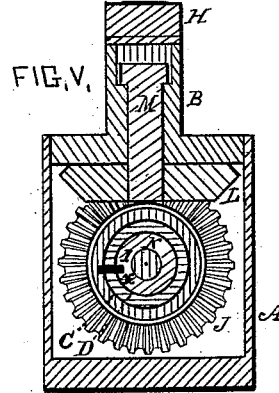
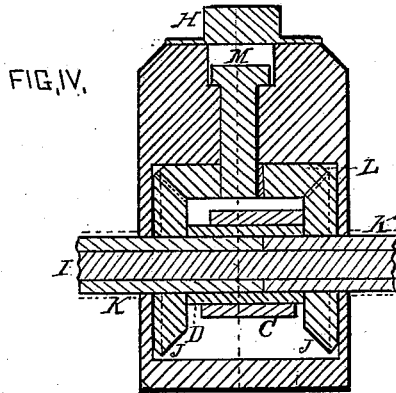
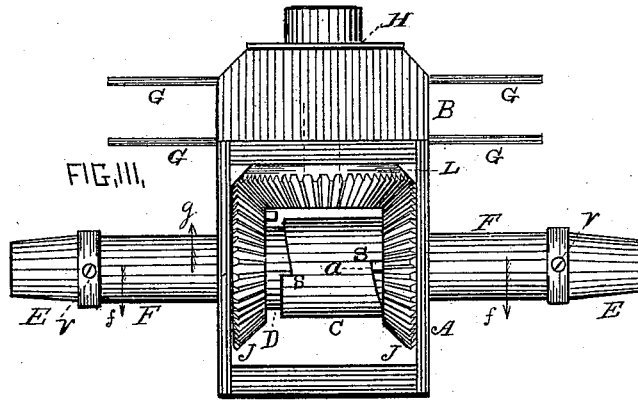
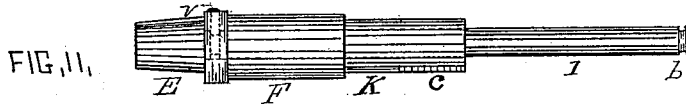
2 Sheets—Sheet 2.

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HARRISON H. BEMIS, OF CHICAGO, ILLINOIS.

LATHE FOR TURNING LASTS.

SPECIFICATION forming part of Letters Patent No. 276,129, dated April 17, 1883.

Application filed August 8, 1882. (Model.)

To all whom it may concern:

Be it known that I, HARRISON H. BEMIS, of Chicago, county of Cook, and State of Illinois, have invented a new and useful Improvement in Lathes for Turning Lasts, of which the following is a specification, reference being had to the accompanying drawings, illustrating the invention, in which—

Figure I, Sheet 1, is an elevation of the central bracket-frame of the well-known lathe for turning lasts from forms or models; Fig. II, Sheet 2, an elevation of one of the arbors and pin-shaft removed from the other parts, more clearly to show the construction; Fig. III, Sheet 2, a face view of the iron box-frame removed from the bracket-frame, and the face-plate of the box removed from the box to show the mechanism inside thereof, by means whereof the arbors may be run in the same direction or the motion of one arbor be reversed; Fig. IV, a vertical central sectional elevation of Fig. III, except that the ends of the arbors are broken away; Fig. V, a vertical section of Fig. III on dotted line *z*; Fig. VI, an elevation of the cam-clutch, by means of which and other mechanism the motion of one arbor is reversed.

The present invention relates to such an improvement in last-turning lathes that not only fac-similes may be turned from a model, but that exact reverse counterparts may be turned.

The nature of the invention consists, in brief, in two central arbors instead of one, and connected by mechanism so that both arbors may be turned in the same direction, and so that one arbor may at all times run in one direction, and the other arbor be reversed to duplicate models and to turn therefrom exact reverse counterparts thereof. It is the custom by well-known mechanism to duplicate models on a last-turning lathe and other lathes which turn from forms, and by a lathe whose arbors are constructed to run in opposite directions only reverse counterparts of models have been produced; but, so far as I am familiar with the state of the art, I am the first one to construct a last-turning lathe or any lathe by means of which both of these functions are attained.

W W represent an elevation of a central bracket-frame of an ordinary well-known last-turning lathe. In such machines this bracket-frame at its ends is attached to the oscillating

frame which carries the model and block to be turned.

E F represent the two arbors, which are journaled to the bracket W W by means of ordinary boxes, N P, and ordinary bearings in the bracket, and their inner ends are bored out to receive a pin-shaft, I, by which the arbors are kept stiff in line and permitted to rotate, both in the same direction, and one in an opposite direction when operated on by the mechanism hereinafter described. Annular grooves *b* are formed on the pin I to receive screws put through the arbors to hold the inner ends of the arbors closely together.

The box-frame for supporting the mechanism is shown at A B; but other forms of frames may be substituted for this one. I however find the one employed the best, inasmuch as it lies wholly between the bars of the bracket, is easily adjusted, simple of construction, excludes dust and chips, and takes up no valuable room. The box may be in part cast-iron with wrought-iron sides secured thereto by screws or otherwise, as most convenient; or it may be cast solid, except the face-plate, which may be secured to the cast part by tongues and grooves. As a matter of good construction, the arbors at K—that is, their inner ends—are turned down smaller than the other parts, that shoulders may be formed to bear against the outer sides of the box-frame, and, by this means and the pin-shaft I and screws turned into the annular grooves *b*, hold the arbors in a fixed position relative to the box-frame. On the inner ends of the arbors is placed an annular collar, D, which is of such a length as to fit closely against the gear-wheels J J, and thereby hold the loose left-hand gear in position. Otherwise than this the left-hand gear would only be held from sliding on its arbor inward by its mesh in the loose gear L, and in this connection it is proper to state that the right-hand gear J is rigidly attached to its arbor, but that the left-hand gear is closely fitted to its arbor, but is not attached thereto. Over the collar D is placed a cam-clutch, C, on each of whose ends is a cam, also a notch, S, that the notch on the right end of the cam-clutch may engage the right-hand pin *a* on the right-hand gear J, where the arbors are to turn in the same direction, and the left-hand notch S engage the pin *a* on the left-hand gear, where the arbors

are to run in opposite directions. The thin portion B of the frame forms a part of one end to the box, and in it is formed a bearing for the support of the journal M to the loose gear L, the exterior opening to the bearing being closed by a cap-plate, H, which excludes the dust. I am not particular as to how the shaft or journal of the gear L is held in place, only so that the gear has a firm support to run true with the gears J J, into which it meshes, and at all times moves with them. There is a key-seat, *c*, formed in the left-hand arbor, and a slot is formed in the collar D, so that a key, *x*, Fig. IV, may connect the arbor and the cam-clutch C by means of a seat in the clutch. From this it will be seen that when both arbors are running in the same direction the left-hand one drives the right-hand one, and the left-hand gear J is then an idler, and that when the left-hand arbor turns in an opposite direction to the right-hand one, the clutch engages the pin *a* on the left-hand gear and locks that gear to its arbor, so that it will drive the loose gear L. Rods G are rigidly attached to the box-frame, and they have bearings in the central bracket, and boxes or caps attached to the brackets, as shown. The purpose of these rods G is to support the box-frame upright with the bracket, and to provide means to guide the box-frame in its lateral movement between the vertical bars of the bracket. It will be seen that the box-frame does not fill the space between said bars, and that it is necessary that the box-frame should have a lateral movement otherwise where blocks to be turned are of different lengths, as is this case, there would not be an equalization of the pressure on the blocks, arbors, dogs, pivots, centers, and arbors, and as a result the box-frame would be driven against the bracket. Therefore the rods G are not clamped so closely to the brackets as to prevent them from having a free longitudinal reciprocating movement.

The operation is as follows: The inner end of the block to be turned is supported by the

right-hand arbor-dog, and the model, at its inner end, is supported in the ordinary manner by the dog on the outer end of the left-hand arbor. Now, to turn a fac-simile of the model, drive the model in the direction of dart *f* and drive it in an opposite direction to turn an exact reverse counterpart of the model, it being understood that the outer end of the model is driven by a dog on the drive-pulley, which is journaled to the oscillating frame, and that the outer end of the block to be turned is supported by a pivot affixed to the opposite end of said frame from the drive-pulley. It is proper to state that the device as shown and described has been applied to use, and that the aforementioned results were attained.

I claim as new and desire to secure by Letters Patent—

1. In lathes for turning lasts from models, the box-frame A B, constructed narrower than the space between the vertical bars of the bracket, in combination with the reversing gear and mechanism, the two arbors E F, and the rods G, whereby the box-frame and its gearing therein and the arbors may have a lateral movement, as specified.

2. The collar D, placed over the inner ends of the arbors, and between the gearing J J, to hold the left-hand gear in position, as specified.

3. The combination of the box-frame A B, gears J J L, arbors E F, collar D, cam-clutch C, pivot-shaft I, and key *x*, connecting the cam-clutch C and the left-hand arbor, and the pins *a a*, as and for the purpose specified and shown.

4. The combination of the cam-clutch, constructed as specified, the gearing J J L, collar D, key *x*, and arbors E F, whereby the arbors may both run in the same direction or they may run in opposite directions, as and for the purpose specified.

HARRISON H. BEMIS.

Witnesses:

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