

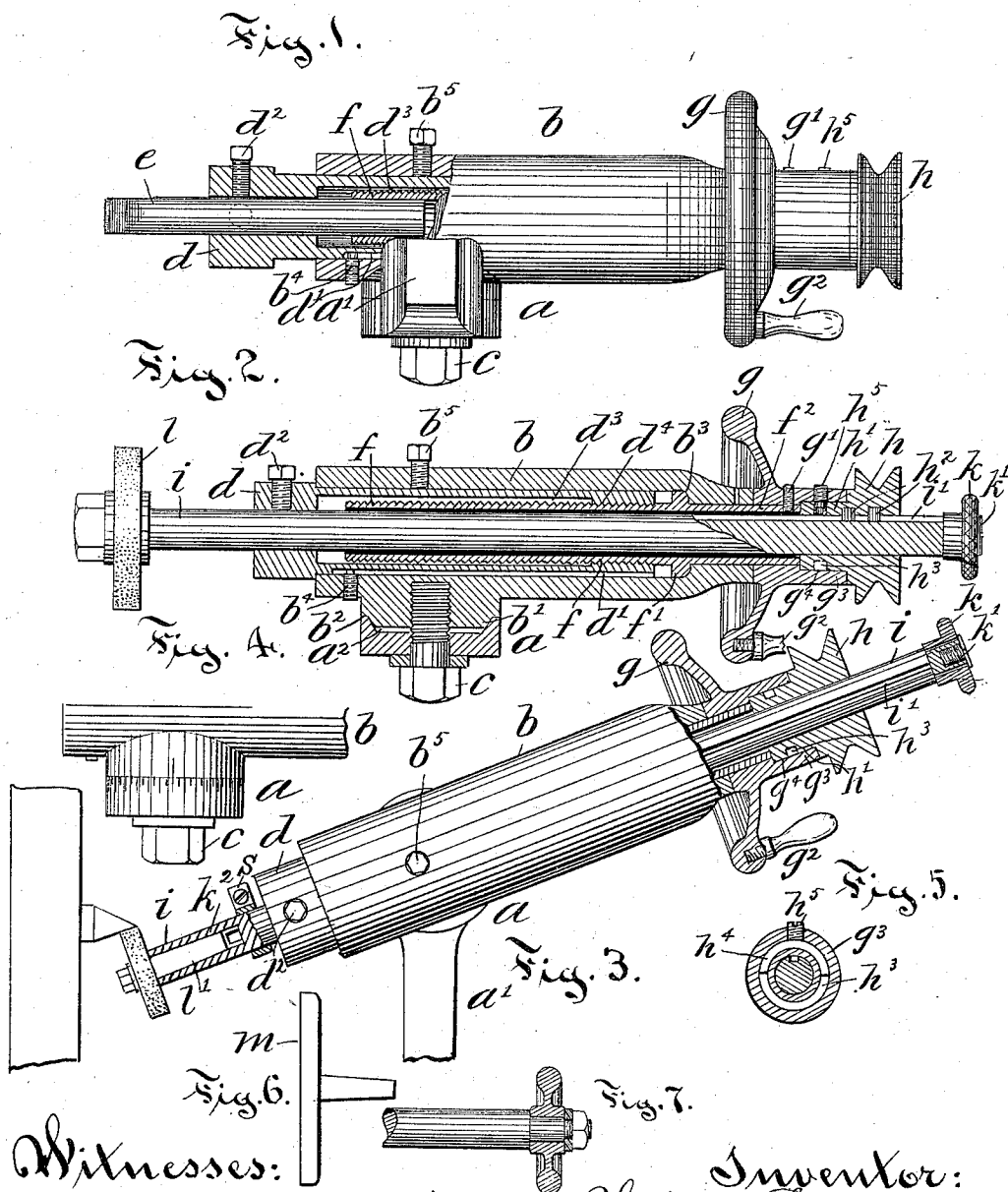
(No Model.)

W. LAWSON.

TAPER BORING OR GRINDING ATTACHMENT FOR LATHES.

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TAPER-BORING OR GRINDING ATTACHMENT FOR LATHES.

SPECIFICATION forming part of Letters Patent No. 533,302, dated January 29, 1895.

Application filed October 17, 1893. Serial No. 488,366. (No model.)

To all whom it may concern:

Be it known that I, WILLIAM LAWSON, of Brooklyn, in the county of Kings and State of New York, have invented certain new and useful Improvements in Taper-Boring or Grinding Attachments for Lathes, of which the following is a full, clear, and exact description, whereby any one skilled in the art can make and use the same.

- 10 The object of my invention is to provide an attachment for lathes or other machine tools by the use of which various operations incident to such tools may be performed in an expeditious and effective manner and with
15 the exercise of a small amount of labor; and a further object is to provide a light portable tool of this class that can be readily attached to any lathe or machine tool in common use thereby increasing its efficiency.
- 20 To this end my invention consists in the details of the several parts making up the tool as a whole and in their combination with each other and with a machine tool, as more particularly hereinafter described and pointed
25 ed out in the claims.

- Referring to the drawings: Figure 1 is a side view, partly in longitudinal section, of my improved device, showing a cutting tool secured therein. Fig. 2 is a view in longitudinal section through the device showing a grinding attachment secured therein. Fig. 3 is a top view, partly in longitudinal section, of the device, showing its manner of use in grinding centers. Fig. 4 is a detail view of the connection between the shank and head stock showing the graduations. Fig. 5 is a detail view in crosswise section through the hub of the hand wheel and grooved pulley showing the shoe. Fig. 6 is a detail view of the face plate. Fig. 7 is a detail view showing a modified form of attachment of the button to the spindle.
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- In the accompanying drawings the letter *a* denotes a pivotal support of the attachment, the shank *a'* of which extends transversely of the attachment and is of any suitable form in cross section, preferably angular to adapt it to be secured in the tool post of the lathe. Near one end of the support is provided a
50 socket *a²* within which is located the pivot

b' located on a projecting part from the body part *b*. The walls of the socket *a²* are inclined outward, the pivot *b'* conforming in shape to said socket. A shoulder *b³* resting upon the upper surface of the support *a* is preferably formed on the pivot *b'* and the pivot may or may not rest in the bottom of the socket *a²*. A retaining screw *c* extends through a hole in the central part of the support *a*, its inner screw threaded end fitting a threaded socket in the pivot *b'* and bearing against the bottom of the socket, a shoulder being formed on the head of the retaining screw that is free to rotate within the support *a* in such manner as to prevent the binding of the pivot or hub *b'* against the support in its movement thereon.

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The body part *b* is tubular and preferably cylindrical as to form in cross section and has located on its interior surface a shoulder *b³*. Extending through the wall of the body part, preferably near the inner end is a screw *b⁴* adapted to engage a longitudinal slot *d'* in the tool holder *d*. A set screw *b⁵* also extends through the wall of the body part *b* and is adapted to bear against the surface of the tool holder *d*.

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The tool holder *d* is located within the body part *b* in such manner as to have a longitudinal movement therein and this tool holder is preferably round in cross section, but it may be of other shapes as rectangular, polygonal, &c. The longitudinal slot *d'* is formed in the outside surface of the tool holder into which the screw *b⁴* extends, serving to hold the tool holder against rotation when desired, but it is obvious that this slot and screw may be dispensed with when the tool holder is of other shape than circular in cross section. In the outer end of the tool holder is located the set screw *d²* for the purpose of clamping therein a cutting tool *e*. A chamber *d³* is formed on the inside of the tool holder and extending rearward from this chamber is a screw threaded opening *d⁴*.

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Within the chamber *d³* is located a tubular feed screw *f* having formed thereon a flange *f'* adapted to fit snugly against the rounded shoulder *b³* in the body part of the device. The feed screw *f* is threaded on its outer sur-
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face, this thread extending preferably from the shoulder to the inner end thereof, this thread fitting the thread on the inner surface of the tool holder. The shank f^2 of the feed screw extends through and beyond the rear end of the body part b and upon this shank is mounted the hand wheel g . A clamp screw g' is adapted to pass through the hub of the hand wheel and through the shank of the feed screw through screw threaded openings therein. The hand wheel may be provided with the handle g^2 for rotating the same.

In the outer end of the hub g^3 of the hand wheel is an enlarged socket g^4 within which is borne the hub h' of the pulley h . This pulley is adapted to receive a belt by means of which it may be turned and in the walls of the central opening extending through the pulley are located recesses into which project the pins h^2 . In the hub h' of the pulley is formed an annular groove h^3 and within this groove is placed a shoe h^4 the outer surface of which is on a plane with the surface of the hub of the grooved pulley. Extending through the hub g^3 of the hand wheel is a screw h^5 which engages a socket in the shoe and prevents the rotation of the latter, the object of this shoe being to take up the wear between the hub of the groove pulley and the socket in the hand wheel.

To adapt this device for use as a grinding tool a spindle i is placed in the tool holder, this spindle extending through the feed screw and through the grooved pulley h and on the outer end of this spindle is borne a button k . This button fits upon the reduced end of the spindle and has a bearing against a shoulder thereon, the spindle being free to rotate within the button. A screw k' is inserted in a threaded socket in the end of the spindle with its head overlying the outer surface of the button in such manner as to hold the latter in place. The spindle bears on its surface a longitudinal groove i' into which project the pins h^2 from the interior of the grooved pulley h , this construction of pins and grooves allowing the spindle a free lengthwise movement through the pulley while turning therewith.

A grinding wheel l may be secured to the end of the grinding spindle as by means of a nut as shown in Fig. 2 of the drawings, or it may be borne on a separate spindle l' tapered to fit within the tapered socket k^2 in the end of the grinder spindle where it is held by means and in a manner common to drill holders.

The support a and the hub or pivot b' may be supplied with proper graduations, as shown in Fig. 4 of the drawings, by means of which any angle at which it is desired to place the tool with regard to the work operated upon may be quickly ascertained.

For squaring up a piece of work or for the purpose of drilling a hole at right angles to any surface on a piece of work placed in the lathe the face plate m is used. This is inserted in the socket in the spindle into which

the cutting tool is to be inserted and by moving the device to the proper position so that the face plate rests squarely on the surface into which a hole is to be drilled the attachment is clamped in this position and the face plate and spindle i removed and a drill inserted in the holder in place of said spindle.

In Fig. 1 the device is shown as holding a cutting tool, this being clamped in place by means of the set screw d^2 and the cutter may be moved toward or from a piece of work by means of the rotation of the hand wheel that is in engagement with the feed screw engaging the threaded socket in the holder.

When the device is intended to be used as a grinder the cutting tool is removed leaving an unobstructed opening through the device from end to end and in this the spindle i is inserted. The spindle may be given a quick motion by means of a grasp on the button if desired, or a steadier motion by means of the feed screw which is accomplished by turning down the screw h^5 to place and causing the screw g' to engage the feed screw, the screw b^4 being in place as shown in Fig. 2 of the drawings, and reverse movement may be had by clamping the holder to the spindle by means of the screw d^2 and holding the feed screw against rotation by means of the hand wheel g .

In Fig. 7 is shown a modified form of attachment of the button to the spindle in which the button is rotatably mounted upon the reduced outer end of the spindle and is held from a movement inward on the spindle by a shoulder formed on the latter against which the button rests. A nut or washer is secured upon the threaded end of the spindle and taking against a shoulder on the latter in such manner as not to bind upon the button while holding it securely in place and allowing its free rotation upon the spindle.

In Fig. 1 of the drawings is shown in dotted lines a transverse tool holding socket extending through the side of the spindle d for the purpose of holding a tool at a different angle from that at which it is held in the opening extending lengthwise in the spindle d .

In Fig. 3 a stop S is shown, and this consists of a spring clamp or collar adjustably located on the spindle i for the purpose of limiting its longitudinal movement.

I claim as my invention—

1. In a tool holder for a lathe or like machine tool, a support adapted to be secured in a tool post of a lathe, the body part of the holder pivotally supported upon the support, the graduations borne on the body part and on the support respectively, the tool holder held against rotation within the body part but free to move lengthwise therein, the feed screw held against lengthwise movement within the body part, and a hand wheel borne on the body part and adapted to engage the feed screw whereby a lengthwise movement of the tool holder is obtained, all substantially as described.

2. In combination in an attachment for a lathe or like machine tool, a support secured to the lathe, the body part pivoted on the support, a pulley borne in the body part so as to rotate therein, a spindle having means of attachment thereto and extending lengthwise through the body part and through the pulley and having lengthwise movement therein but secured to the pulley to rotate therewith; and a button rotatably mounted on the end of the spindle, all substantially as described.

3. In combination in an attachment for a lathe or like machine tool, a body part having means of attachment to a lathe, a tool holder located in the body part, a feed screw engaging the tool holder, a spindle extending through the holder and through the feed screw and adapted to be secured to each and also having free lengthwise movement therein, a hand wheel mounted on the feed screw and adapted to be secured to the feed screw, and a pulley borne in the hand wheel and free to revolve independently thereof and secured to the spindle to compel its rotation but allowing it a lengthwise movement therein, all substantially as described.

4. In combination in an attachment for a lathe or like machine tool, a support, a body part pivoted to the support, a tool holder borne in the body part, a feed screw borne in

the holder and in the body part, a hand wheel borne on the feed screw, a pulley borne in the hand wheel, a shoe supported in an annular groove in the hub of the pulley, an adjusting screw passing through the hub of the hand wheel and engaging the shoe, and a spindle extending through the pulley to rotate therewith but having lengthwise movement therein, all substantially as described.

5. In combination with a lathe or like machine tool, a support attached thereto, a body part pivoted to the support, graduations on the support and body part, the tool holder borne in the body part and having a lengthwise groove, a screw from the body part engaging said groove, a set screw in the tool holder, a feed screw engaging the holder and held against lengthwise movement in the body part, a hand wheel supported on the feed screw and adapted to be secured thereto, a pulley borne in the hand wheel, pins engaging the pulley and groove in the spindle and a spindle with the lengthwise groove and adapted to be secured to the hand wheel and to the tool holder, all substantially as described.

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