

M. P. HODGE.
TAPER ATTACHMENT FOR LATHES.

No. 502,401

Patented Aug. 1, 1893.

Fig. 3,

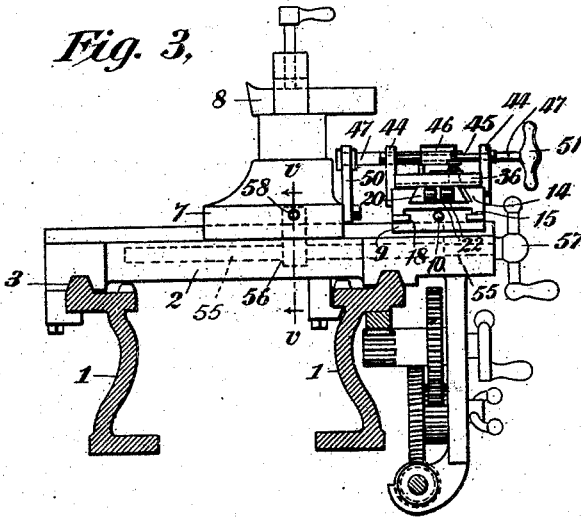


Fig. 7,

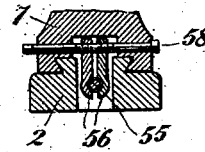


Fig. 4,

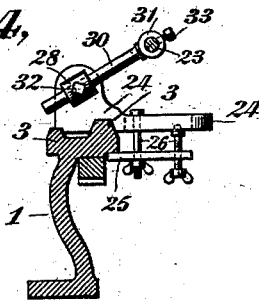


Fig. 6,

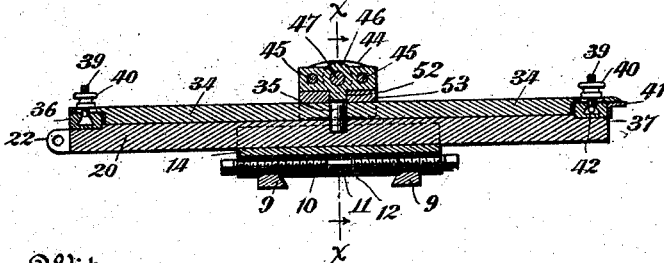
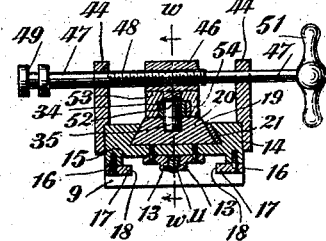


Fig. 5,



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UNITED STATES PATENT OFFICE.

MARTIN P. HODGE, OF JERSEY CITY, NEW JERSEY, ASSIGNOR OF ONE-HALF TO LUTHER LAWRENCE FRAZIER, OF BROOKLYN, NEW YORK.

TAPER ATTACHMENT FOR LATHES.

SPECIFICATION forming part of Letters Patent No. 502,401, dated August 1, 1893.

Application filed December 30, 1892. Serial No. 456,760. (No model.)

To all whom it may concern:

Be it known that I, MARTIN PERRY HODGE, a citizen of the United States, and a resident of Jersey City, in the county of Hudson and State of New Jersey, have invented certain new and useful Improvements in Taper Attachments for Lathes, of which the following is a specification.

My invention relates to that class of attachments for lathes by which the cutting-tool is, by means of an angularly-arranged guide-bar, automatically fed crosswise or transversely of the lathe during the longitudinal travel of the carriage or slide-rest, whereby the object being acted upon by the tool is cut or formed on a taper, and my invention has for its main purpose to provide a firm, durable and effective contrivance of this description, and one which is adapted for attachment to practically all kinds or makes of lathes.

To these main ends my invention consists in the various features of construction and combinations of devices hereinafter more fully described and particularly pointed out in the appended claims.

In the accompanying drawings, Figure 1 is a front elevation of a lathe having my invention embodied therein. Fig. 2 is a plan view of the same. Fig. 3 is a vertical section taken at the line *z, z* of Fig. 2. Fig. 4 is a vertical section taken at the line *y, y* of Fig. 1. Fig. 5 is a vertical section taken at the line *x, x* of Figs. 1 and 6. Fig. 6 is a vertical longitudinal section taken at the line *w, w* of Fig. 5; and Fig. 7 is a detail sectional view taken at the line *v, v* of Fig. 3.

In the various views the same parts will be found designated by the same numerals of reference.

1 designates the bed of a lathe which may be of any desired design or detail construction.

2 is the lathe-carriage or slide-rest, adapted to travel on ways 3 arranged longitudinally of the bed, and 4 and 5 are respectively the head and tail stocks of the lathe. Transversely of the slide rest and upon the top side thereof is formed a way 6, whose sides are beveled downwardly and inwardly, and said way extends preferably the full width of the slide-rest.

7 is a slide or block adapted to travel along said way and provided at its upper portion with means for holding the usual cutting-tool 8.

9 9 are two jaws beveled on their interior sides to match the sides of the way 6, and said jaws are clamped upon said way by means of a right and left hand screw 10, whose threads pass through corresponding female threads formed in said jaws above their beveled sides. On either end of the screw 10 is a squared portion for the application of a wrench or key, whereby the jaws may be caused to simultaneously either approach or recede from each other, and thus either clamp or release the said way. Centrally of the screw is a plain portion 11 with a shoulder 12 on either side, and said shoulders abut against stops 13, which prevent any endwise movements of said screw. The said stops 13 are attached by screws to a slide 14, which is provided with a groove 15 on its under side. Attached by screws to the under side of the slide 14 and extending longitudinally thereof are two bars 16 which project inwardly to form flanges or tongues 17, which fit in grooves 18 in each jaw-piece 9, the grooves 18 being cut above and transversely of the face of the beveled jaw-portion. By this construction and arrangement the jaw-pieces are supported by the slide 14, and when clamped upon the way 6 they serve to hold the said slide 14 and its attachments firmly to or upon said way, and hence upon the carriage or slide-rest.

The upper side of the slide 14 is formed with an inwardly and upwardly beveled recess 19, which receives a correspondingly shaped way or guide 20, and preferably in said recess is arranged a gib 21 which, by means of screws may be adjusted against the way or guide 20 to obtain the requisite fit and provide for wear. The way 20 for the slide 14 is arranged longitudinally of the lathe and at each end is provided with eyes 22 for the attachment thereto of a tie-rod 23, which extends in the direction of the way 20 and is connected to the bed or to some other stationary part of the lathe.

The rod 23 is preferably connected to the bed, through adjustable brackets or supports, in the following manner:—24 is a bracket

grooved out on its under side to match the ways 3 of the lathe, and 25 is a plate which bears against a ledge on the under side of one of the ways, and by means of bolts and nuts 26 connecting said bracket to said plate, the former is securely clamped upon the bed of the lathe, and in a manner such that it may be adjusted to any desired point lengthwise of the lathe. In the upper portion of the bracket 24 is an aperture, through which passes a bolt 27 provided with an eye 28, and said bolt is secured to said bracket by a nut 29. Through the eye 28 is slipped the shank 30 of a bracket 31, and said shank may be secured by a set screw 32. The rod 23 at its free end passes through an eye in the bracket 31 and is secured thereto by a set screw 33. By this construction and arrangement of brackets or supports for the rod 23, said rod may be set in any desired position, according to the size or character of the lathe upon which the attachment is used, and in accordance with the position of the way 20, of which it forms an extension. Upon the way 20 is pivoted a guide-bar 34, the pivot 35 thereof being arranged centrally of the bar. At the ends of the way 20 are secured blocks 36 and 37 having dove-tailed grooves 38, in which slide suitable bolts 39, which pass up through holes in the ends of the guide-bar 34, and are provided with set nuts 49. The right hand block is preferably provided with a scale or index 41, and the right hand end of the guide-bar is preferably fashioned into a pointer, as shown at Fig. 2. The said guide-bar by means of the scale may, after loosening the nuts 40, be adjusted to and set at any desired angle or in accordance with the taper to be given the article being turned.

To facilitate the adjustments of the guide-bar 34 I provide a screw 42 and form a nut in the head of the right hand bolt 39, so that by the turning of said screw the bolt may be fed along the same in one direction or the other, according to the direction the screw is turned, and the guide-bar 34 adjusted accordingly. After adjustment the said nuts 40 are screwed down to hold the bar firmly in place. The slots 38 may be arc-shaped, struck from the pivot 35 as a center, or they may be straight, as shown, and the guide-bar 34 provided with longitudinal slots 43.

On the longitudinal sides of the slide 14 are secured uprights or supports 44, between and fastened to which are two round guide-rods 45, which pass through holes in a sliding block 46. Between said guide-rods and supported in said uprights is a shaft or spindle 47, which, between said uprights, is provided with a screw 48, which engages threads formed transversely in the block 46. The inner end of the shaft 47 is shouldered, as at 49, to receive the upper bifurcated end of an arm 50, rigidly secured to the slide 7, which carries the cutting-tool, and the outer end of said shaft is provided with a handle 51, by which the said shaft may be turned and moved lengthwise

to carry the slide 7 and the tool 8 to or from the work.

On the under side of the block 46 is a pivot 52, which enters a recess or bearing in the upper side of a sliding shoe-piece 53, which is slotted or forked to embrace the guide-bar 34, a gib 54 being provided to obtain the desired closeness of fit and to take up any wear which may occur.

When the taper attachment is removed from the lathe the slide 7 and the tool 8 are moved transversely of the lathe by means of a screw 55 engaging a nut 56 depending from the slide 7 and provided at its outer end with a handle 57. In order that this means for moving the tool transversely may be readily thrown into an inoperative condition, so that the tool may be automatically moved back and forth, during its longitudinal movement along the work, I make the nut 56 in two parts or halves, and hang the same upon a right and left hand screw 58 arranged longitudinally of the lathe, supported in the slide 7, and provided at each end with an angular portion to receive a wrench or other tool, by which it may be turned. By this construction it will be seen that when the tool holder is to be automatically moved back and forth it is only necessary to turn the screw 58 in a direction to separate the jaws of the two-part nut 56, and when thus separated said jaws will move readily over or past the screw shaft 56 during the reciprocations of the slide 7.

I shall now proceed to describe the operation of a machine having my taper attachment applied thereto, it being of course understood that the screw 58 has been turned to effect a disengagement of the screw shaft 55 and nut 56. As the carriage travels toward the right, or in the direction of the arrow at Fig. 2, the tool 8 is caused to automatically travel toward the center of the object being turned and thus to cut the same to a taper in a direction from the head to the tail stock. This automatic transverse movement of the tool is effected in the following manner:— During the movement of the carriage or rest 2, the slide 14, being clamped upon the way 6, which is a part of the rest, is caused to move with the rest and to slide along the longitudinally-arranged stationary way 20, which is supported in said slide, and is prevented from moving longitudinally while the slide is moving by means of the tie-rod 23, which is connected to the bed or frame-work of the lathe. As the block 46 is connected to the slide 14 and carries the nut or shoe 53, and as the slide 7 and the tool 8 are connected also to the slide 14, all of these parts travel longitudinally of the lathe with the carriage or rest. The guide bar 34 being connected rigidly (but adjustably) to the stationary way 20 is prevented from moving lengthwise during the movement of the rest and its appurtenances, and being set at an angle and clamped securely, acts upon the nut or shoe 53 during its movement longitudinally of the machine

and causes said shoe piece to approach the work. Inasmuch as the nut or shoe is connected to the block 46, it operates to slide said block transversely along the guide-rods 45, and also to cause the said block to slide the screw-shaft 47 inwardly and, through its connection with the slide 7, force the tool inwardly or rearwardly toward the center of the object being turned. As the movement of the tool toward the center of the work occurs gradually and during the movement of the tool lengthwise of the work, due to the movement of the rest, the object being acted upon by the tool is thus progressively cut or turned to a tapering form and at an angle predetermined by the set or angular position of the guide-bar. When the tool shall have traveled the desired length, the carriage or rest is returned, and by means of the handle 51 the operator may feed the tool forward by hand a slight distance for the beginning of a new cut, and so on until the object in the lathe is turned to the desired extent and taper. If the nuts 40 be unloosened and the guide-bar set parallel with the way 20 the taper attachment or contrivance as a whole may be thrown into disuse without removing it from the lathe, but when this is effected the screw 58 should be turned to cause the two-part nut to again engage the threads of the shaft 55, in order that the tool holder may be moved back and forth by hand in the performance of ordinary or cylindrical turning, but of course if desired, the taper attachment may be entirely removed from the lathe. If found more convenient the rod 23 may be connected to the way 20 at the left hand side of the lathe, and since the way 6 extends entirely across the top of the rest or carriage, the taper attachment or contrivance may, if desired or necessary, be connected at the rear side of the lathe. I have found in actual practice that by the construction shown and described, the contrivance may be adjusted to practically all lathes and at either end as well as at the front or rear side thereof.

The slide 14 serves to connect the attachment to the carriage or slide-rest of the lathe, and being made as a fixture on the bed, operates as a carrier for the nut or shoe piece, the block, the shaft, &c., during the movements of the slide-rest. Being comparatively long, the slide 14, moving always in a right line and parallel with the axis of the lathe centers, has an extended bearing on the guide or way 20, along which it slides, and maintains the latter always in parallelism, without liability to flexure, and hence the guide-bar 34 on said way is supported always firmly in absolutely true position at all stages of the movement of the carriage or slide-rest, although the guide or way 20 may be connected to the bed or frame-work at one end only.

Various changes may be made without departing from the gist of my improvements.

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

1. In a taper attachment for lathes, the combination of a slide adapted to be secured to the carriage or slide-rest, a guide or way passing through the said slide and adapted to be secured to a stationary part of the lathe, a guide-bar connected to the said way and adapted to be adjusted to various angles, a shoe-piece adapted to traverse the said guide-bar, a guided block 46 connected to said nut and said slide and adapted to slide transversely of the guide or way and provided with means to enable its attachment to the tool-holder or slide of the lathe.

2. In a taper attachment for lathes, the combination of a slide adapted to be secured to the carriage or slide-rest, a guide or way adapted to be secured to a stationary part of the lathe, a guide bar connected to said way and adapted to be adjusted to various angles, a shoe-piece adapted to traverse the said guide-bar, a block connected to said shoe-piece, transverse guide-rods for said block supported by said slide, and means for connecting the said block to the tool-holder or slide of the lathe.

3. In a taper attachment for lathes, the combination of a slide adapted to be secured to the carriage or slide-rest, a guide or way adapted to be secured to a stationary part of the lathe, a guide-bar connected to said way and adapted to be adjusted to various angles, a shoe-piece adapted to traverse the said guide-bar, a block having a threaded hole and connected to said shoe-piece, means for guiding said block transversely, and a shaft or spindle provided with a threaded portion engaging the threaded hole in said block, whereby it may be independently turned to feed the cutting tool by hand, and also arranged to slide in supports bodily with said block during its automatic movements.

4. In a taper attachment for lathes, the combination of the slide 14, the guide or way 20, the guide-bar 34 pivoted on said way, the shoe-piece 53, the block 46 connected to said shoe-piece, and having a threaded aperture, the shaft or spindle 47, having a screw thread, and supports therefor connected to said slide.

5. In a taper attachment for lathes, the combination of a slide provided with transverse jaw-pieces adapted to clamp the way on the carriage or slide-rest of a lathe, the way 20, the guide-bar, the shoe-piece, the transversely-sliding block, and the shaft or spindle adapted for connection to the tool-holder of the lathe.

6. In a taper attachment for lathes, the combination of a slide, the transversely arranged jaw-pieces adapted to slide in grooves longitudinally of said slide to clamp the way 6 on the carriage or slide-rest of a lathe, the way 20, the guide-bar, the shoe-piece, the transversely-movable block, and the shaft or spindle.

7. In a taper attachment for lathes, the combination of a slide, the transversely-arranged jaw-pieces adapted to slide in grooves longi-

tudinally of said slide, a right and left hand screw for moving said jaw-pieces, the way 20, the guide-bar, the shoe-piece, the transversely-sliding block, and the shaft or spindle.

5 8. In a taper attachment for lathes, the combination with a fixed guide-bar, a shoe-piece for traversing the same, a block connected to said shoe-piece and adapted to travel cross-wise of said guide-bar, a shaft or spindle
10 adapted to travel with said block, and having also a threaded connection with said block, whereby it may be moved back and forth independently of said block, and thereby set the tool for any depth of cut.

15 9. In a taper attachment for lathes, the combination of a slide, adapted to be secured to the carriage of a lathe, the way 20, upon or over which the said slide travels, constructed at each end for connection to the bed or frame
20 work of a lathe, a guide-bar, a shoe-piece for traversing said guide-bar, means for connecting the said shoe-piece to the tool-holder, and adjustable clamping means for connecting the said way 20 either at the front or the rear
25 of the lathe or on the right or on the left hand side thereof, according to the desire of the user or the style or construction of lathe.

30 10. In a taper attachment for lathes, the combination of the way 20, the slide 14, the guide-bar, a shoe piece for traversing the same and adapted for connection to the cutting tool of a lathe, the adjustable rod 23 connected to the said way 20, and the adjustable and movable brackets or supports for
35 said rod.

40 11. In a taper attachment for lathes, the combination with a guide-bar, of a sliding and guided block connected thereto to be moved transversely thereof, a shaft or spindle arranged to be carried with said block and to be connected to the tool-holder, and also arranged for movement independently of said block to adjust the tool for obtaining the desired depth of cut.

45 12. The combination, in a lathe, of the carriage, the way 6 thereon, the slide 7, a slide, as 14, secured to said way 6, a guide or way 20, arranged in the direction of travel of the carriage and held stationary by suitable connections to the bed or frame-work of the lathe, the guide-bar mounted upon said
50 way 20, the shoe-piece, the block 46 adapted to slide transversely of the way 20, and connections between the said block and the slide
55 7, whereby during the movements of the carriage longitudinally the slide may be moved transversely.

13. The combination, in a lathe, of the car-

riage, the way 6 thereon, the slide 7 on said way, the slide 14 attached to said way at 60 right angles thereto, the way 20 connected to the bed or frame-work of the lathe, the guide-bar, the shoe piece, the block 46 adapted to travel transversely of the way 20, and the screw shaft or spindle 47 connected to said
65 block and to the said slide 7.

14. The combination, in a lathe, of the carriage, the way 6, the slide 7, the way 20 constructed at each end for attachment at either end of the lathe-frame or bed, the slide 14
70 constructed for attachment to the way 6 at either side of the lathe, the guide-bar 34, the shoe-piece, and connections between the same and the slide 7.

15. The combination, in a lathe, with the
75 slide 14 clamped to the way 6 of the bed of the slide-rest and having a transversely-movable block connected to the tool-holder and also a shoe-piece, of a relatively-fixed but adjustable guide-bar.
80

16. The combination, in a lathe, with the slide 14, having beveled clamps and attached to the dovetailed way 6 on the slide-rest, and having a transversely movable block connected to the tool-holder and also a shoe-
85 piece, of a relatively-fixed but adjustable guide-bar, and a fixed support for said guide-bar arranged parallel with the line of movement of the carrier 14.

17. The combination in a lathe, of the carriage, the dove-tailed way 6 thereon, the slide 14 carrying adjustable beveled jaws 9, 9, arranged transversely of the slide, a right and left hand screw for moving said jaws, a dove-tailed way 20 in a corresponding recess in
95 the slide 14, a guide-bar 34 pivoted on said way 20, a shoe piece for traversing said guide-bar, a block 34 pivoted to said shoe-piece, guides for said block connected to said slide 14, and a shaft or spindle connected to the
100 tool-holder and the said block and supported by said slide 14.

18. The combination, in a lathe, of the carriage, the slide 14 connected thereto, the way 20, the guide-bar 34, the shoe-piece for traversing the same connected to the tool holder, the tie-rod 23, the bracket 24, the plate 25, the bracket 31 having shank 30, and retaining bolts and nuts.
105

Signed at New York city, in the county of
New York and State of New York, this 28th
day of December, A. D. 1892.

MARTIN P. HODGE.

Witnesses:

JACOB FELBEL,
IDA MACDONALD.