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H. H. HARDINGE

**2,299,622**

## TOOL POST FOR LATHES

Filed July 19, 1940

2 Sheets--Sheet 1

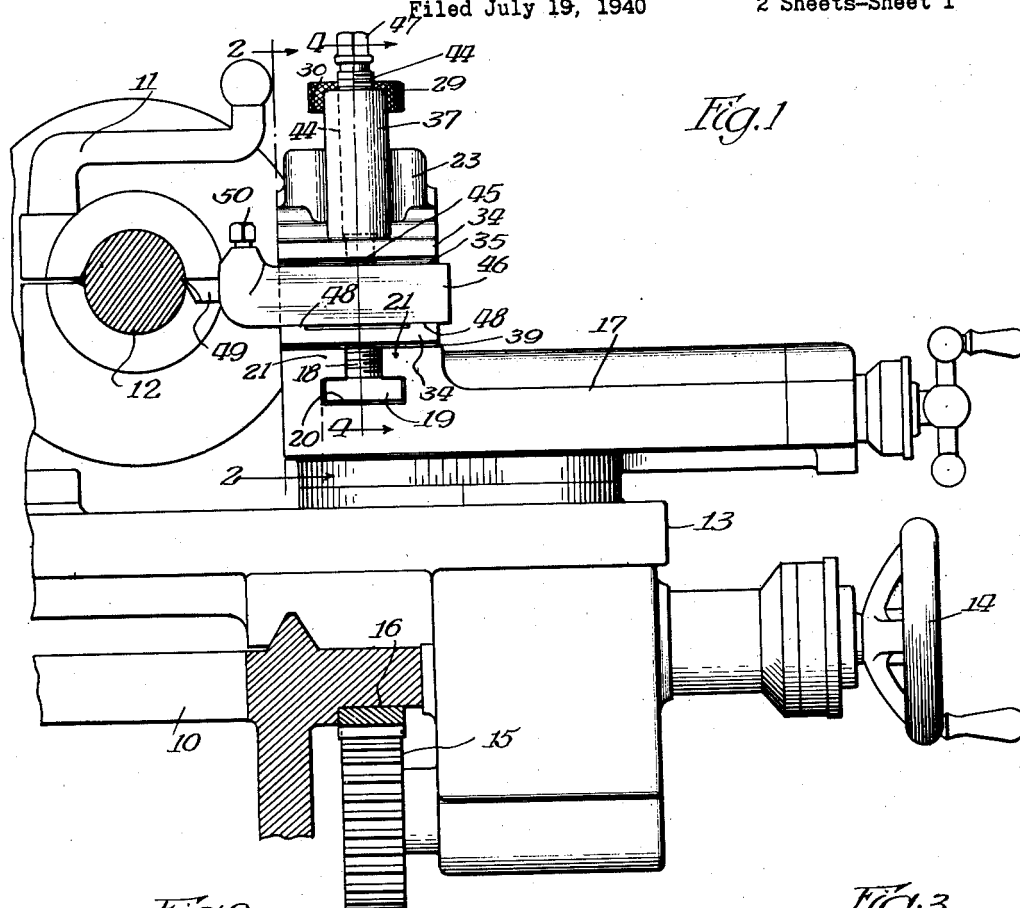


Fig. 2

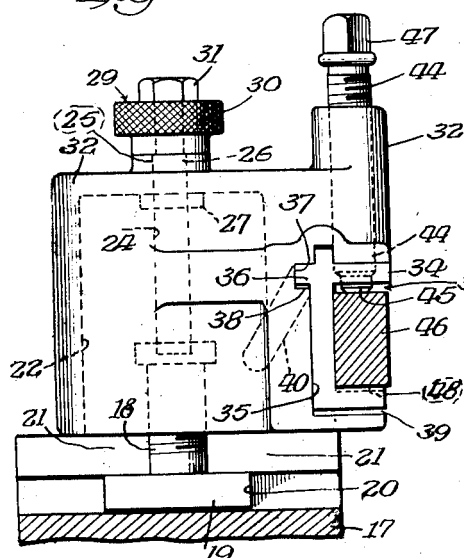
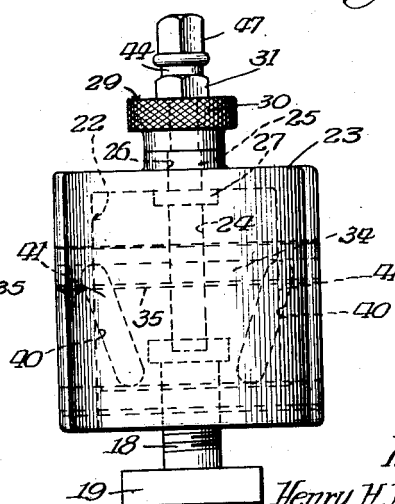


Fig. 3



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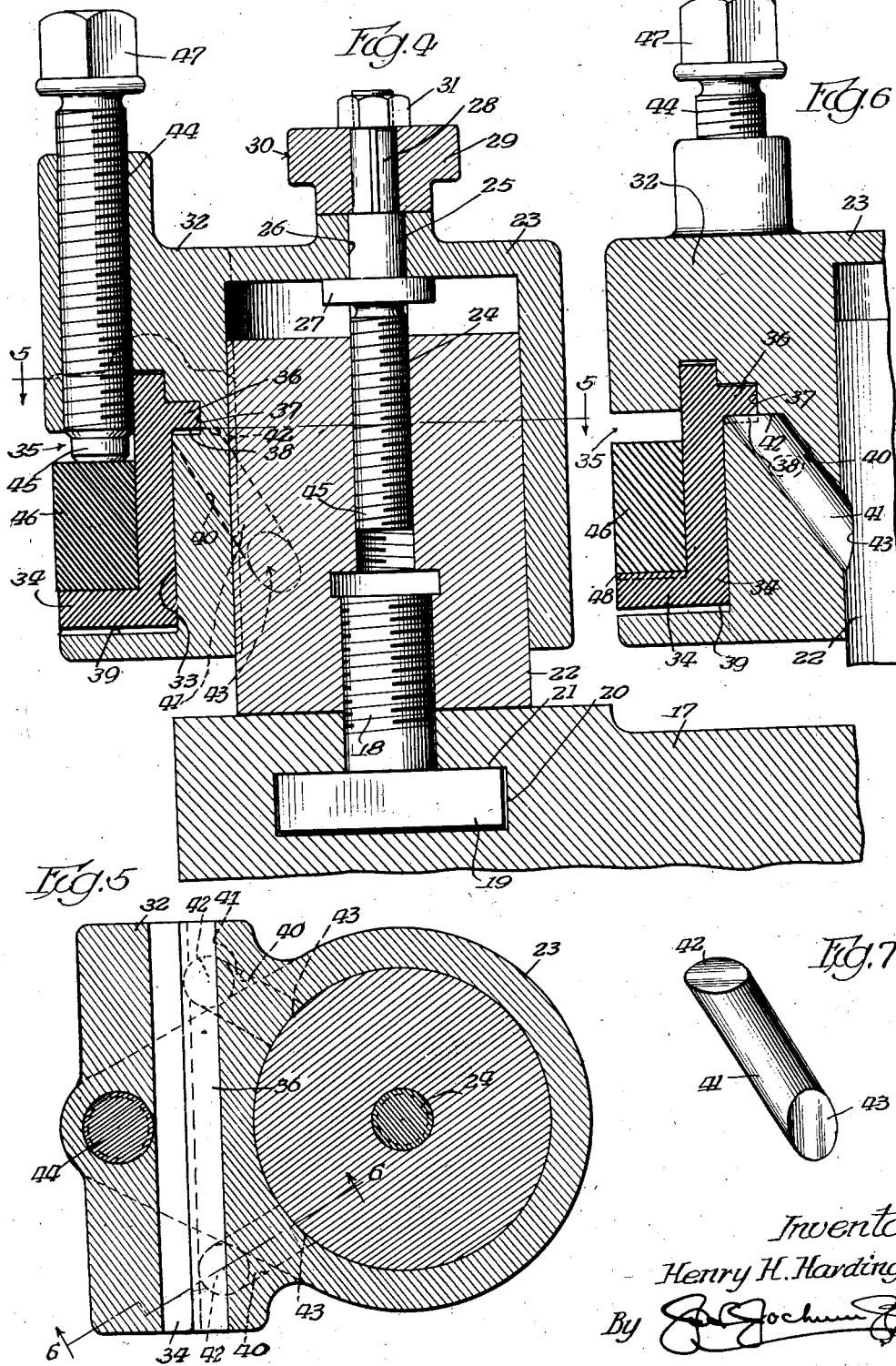
By John Gochman Att.

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2 Sheets-Sheet 2



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## UNITED STATES PATENT OFFICE

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## TOOL POST FOR LATHES

Henry H. Hardinge, Chicago, Ill.

Application July 19, 1940, Serial No. 346,339

26 Claims. (Cl. 82-37)

This invention relates to improvements in tool posts for lathes, and one of the objects of the same is to provide an improved post of this character by means of the use of which there will be an increase in the speed and accuracy in which work is done on lathes.

A further object is to provide an improved post in which the conventional rocker and ring now generally employed will be dispensed with, and at the same time there will be provided an improved post which, when in operative position, will provide the maximum vision of the work being operated upon.

Furthermore, the distance between the cutting part of the tool held by the post and the center around which the tool holder swings will be reduced to a minimum, thereby permitting the use of a straight tool and enabling the operator to assume a position in front of the work instead of off to the side as is the case with the ring and rocker arm now in common use.

A further object is to provide an improved post of this character in which there is provided an open sided seat for the tool, thus enabling the employment of the largest size tool for the work, and at the same time providing great rigidity.

A further object is to provide improved means for vertically adjusting the tool by means of a single screw, an improved means whereby a three-point bearing on the tool holder will be provided.

Heretofore the usual custom has been to clamp the tool in the tool holder and then by the use of another clamp or fastening means secure the tool post in the desired position, thus necessitating the adjustment of several clamping or securing means, with the result that it often happens that no matter what pressure is brought to bear on the binding post of the tool posts, it frequently happens that there will be a relative movement of the parts especially if a heavy cut upon the work is to be made.

It is therefore another object of the present invention to overcome these difficulties and objections and to provide an improved tool post of this character which will be of a simpler construction and operation, and one in which there is provided a single operable means for clamping or binding all of the movable parts and also the tool in the holder.

To the attainment of these ends and the accomplishment of other new and useful objects as will appear, the invention consists in the features of novelty in substantially the construction, combination and arrangement of the several

parts hereinafter more fully described and claimed and shown in the accompanying drawings illustrating this invention, and in which

Figure 1 is a side elevation of a tool post of this character constructed in accordance with the principles of this invention showing the same applied to a tool post carriage mounted upon a lathe, a portion of the lathe being shown in elevation and a portion in section.

Figure 2 is a view taken on line 2-2 Figure 1. Figure 3 is a left hand end elevation of Figure 2 with parts omitted.

Figure 4 is a detail vertical sectional view taken on line 4-4 Figure 1, on an enlarged scale.

Figure 5 is a horizontal sectional view taken on line 5-5 Figure 4.

Figure 6 is a detail sectional view taken on line 6-6 Figure 5.

Figure 7 is a detail perspective view of one of the fastening pins.

Referring more particularly to the drawings, the numeral 10 designates a portion of a lathe; 11 designates clamping means for holding the work 12, and 13 designates a lathe carriage which is operable by the ordinary hand wheel 14 through the medium of the usual gear and rack 15-16.

Mounted upon the lathe carrier is a tool post carriage 17 and these are of the ordinary and usual construction.

The numeral 18 designates a bolt having a head 19 that is adapted to enter the usual groove 20 in the tool post carriage 17 so that the overhanging portions 21 will extend over the head 19 adapting the tool post to be adjusted with respect to the tool post carriage and to also be clamped for adjustment with respect thereto.

The tool post is designated by the reference character 22 and into this post the screw 18 is threaded and by rotating the post 22 with respect to the screw 18 the post may be clamped to the carriage 17, a portion of the carriage between the head 19 of the screw and the end of the post 22 being gripped therebetween. The post may be of any desired size and configuration and of any desired height. A shell or hollow member 23 is telescoped over the tool post 22 and this shell is adapted to be adjusted vertically with respect to the post preferably by means of a screw 24 which is rotatably secured to this shell 23 preferably by means of a reduced portion 25 of the screw passing through an opening 26 in the shell.

A collar 27 is carried by the screw and engages the under surface of the shell 23. The free extremity 28 of the reduced portion 25 of the screw

24 may be of any desired configuration in cross-section but is preferably angular and is adapted to receive a nut or collar 29 having a knurled periphery 30, the collar being secured to the screw in any suitable manner, such as by means of a nut 31 threaded upon the extremity 28. The collar 29 is held upon the screw 24 against rotation with respect thereto and is adapted to be turned to effect a rotation of the screw 24 with respect to the shell 23, with the result that the shell may be raised or lowered with respect to the tool post 22 to any desired extent, according to the direction of rotation of the screw.

A portion of the shell 23 is shaped to form a bracket 32 having an open side 33, the bracket being of any desired length. Arranged within the open side 33 of the bracket 32 is a holder 34 which is also provided with an open side 35. This holder is provided with a laterally projecting flange 36 that projects into an open sided recess 37; the flange 36 is of a thickness less than the vertical dimension of the recess 37 so as to provide a space 38 beneath the flange 36, for a purpose to be set forth.

The holder 34 is also of a height less than the height of the open side 33 so as to provide a space 39 beneath the holder, also for a purpose to be set forth.

The bracket 32 is provided with inclined openings 40 which communicate with the recess 37, and any number of these openings 40 may be provided but preferably two are shown that are spaced from each other in directions lengthwise of the bracket 32, as shown more clearly in Figure 5. Within each of the openings 40 is arranged a pin 41 which is preferably provided with a flat end 42 and a beveled or inclined end 43.

The pins are of a diameter to fit within the respective openings 40 so that they may be moved therein and are of such a length that when in position the beveled end 43 will contact the periphery of the tool post 22 and the straight end 42 will project slightly into the recess 37 so as to be contacted by the lower face of the flange 36 on the holder 34.

The screw 44 is threaded through the bracket 32 and is preferably provided with a reduced end 45 that is adapted to engage the edge of a tool 46 that is seated within the open sided recess 35 to rest upon the bottom of the holder 34. This screw may be adjusted in any desired or suitable manner and to that end there may be provided an angular extremity 47 adapted to receive a tool whereby the screw may be turned.

While there is shown in the present exemplification of this invention only one screw 44, it is obvious that if desired, any number of screws may be provided.

The bottom of the recess 35 of the holder 34 is preferably shaped to form spaced bearing points 48 upon which the tool 46 rests and the screw 44 is preferably so arranged that its extremity 45 will contact the tool 46 at a point intermediate the bearing surfaces 48 thereby providing a three-point contact for the tool 46.

In the present exemplification of the invention the tool is provided with a separate cutting point or extremity 49 held in position by means of a bolt or screw 50, but it is to be understood that the tool or cutting point may be formed as an integral structure.

With this improved construction it will be manifest that the shell 23 together with the tool holder may be vertically adjusted with re-

spect to the post 22 by simply rotating the nut or collar 29. After the desired adjustment has been obtained, the tool 46 may be clamped in position.

During the adjustment of the shell 23 the screw 44 is adjusted so that the extremities 43 of the pins 41 will not bind upon the tool post 22. However, when the shell 23 has been adjusted to the desired position, then the screw 44 is adjusted to force the tool holder or carrier 34 downwardly within the recess 35 and, as the flange 36 rests upon the end 42 of the pins 41 and as the shell 23 is held against adjustment with respect to the post 22 by the screw 24, it will be manifest that the movement of the screw 44 in a direction to clamp the tool 46 will have two results, that is, when the end 45 of the screw 44 engages the tool 46 it will tend to force the same downwardly in the recess 35 against the bottom of the recess and this operation will also force the tool carrier or holder 34 downwardly in the recess 35, the spaces or recesses 38-39 respectively under the flange 36 and the bottom of the holder 34 permitting of such movement of the tool holder 34 with respect to the bracket 32.

As the tool holder 34 is forced downwardly the pins 41 will also be forced downwardly through the openings 40 and with respect to the bracket 32 causing the ends of the pins 43 to be forced against the tool post 22 and thereby not only clamp the tool 46 in the tool holder but also operating to cause the shell 23 to bind against the post 22 thereby securing the shell against movement with respect to the tool post 22.

It will therefore be manifest that with this improved construction there is a single clamping or fastening means for clamping the tool in the tool holder and the tool holder against movement with respect to the tool post. This construction is advantageous in that it not only permits of a quick adjustment of the parts but provides a single clamping or screwing means for the movable parts.

Furthermore, with this construction after the cutting point of the tool has been once adjusted, it is not necessary to adjust the shell or tool holder in the event that the tool is removed for sharpening, as all that is necessary is to release the screw 44 to permit removal of the tool and to adjust the screw 44 to clamp the tool in position when it is re-inserted in the holder 34.

In assembling the parts, the screw 18 is adjusted with respect to the post 22 so that the head 19 of the screw may be inserted into the groove 20, after which the post 22 may be rotated so as to effect a clamping action of the post and head of the bolt to secure the post against movement with respect to the carriage.

The tool 46 may then be placed in position and held against displacement by adjusting the screw 44 only sufficiently to hold the tool. The shell 23 and tool may be then rotated about the post 22 and when the tool is in the proper position, the screw 44 is adjusted to secure the tool in the holder and the shell and holder against rotation about the post 22. Obviously any vertical adjustment of the shell is accomplished by the screw 24 before the shell is clamped to the post 22.

While the preferred form of the invention has been herein shown and described, it is to be understood that various changes may be made in the details of construction and in the combina-

tion and arrangement of the several parts within the scope of the claims without departing from the spirit of this invention.

What is claimed as new is:

1. A lathe tool post embodying a post proper, means mounting said post for slidable movement upon a tool post carriage of a lathe, a tool holder, means mounting said tool holder upon said post for slidable adjustment and for rotatable movement with respect to the post, means carried by the first said means and operable against the side post for binding said holder against movement with respect to said post at any point to which it has been slidably adjusted upon the post, and means other than either of the aforesaid means and embodying a single element for clamping a tool in said holder and for rendering the said binding means active.
2. A lathe tool post embodying a post proper, a member telescoping with said post, said member being rotatable upon the post and adapted for bodily adjustment in directions lengthwise of the post, means for effecting such lengthwise adjustment, a tool holder mounted upon said member for movement therewith and with respect thereto, means other than the last recited means for binding said member against movement with respect to said post in any position to which said member has been adjusted, said binding means being rendered active by the said tool holder when the latter is moved in one direction with respect to said member, and an adjusting element for securing a tool in said tool holder and for effecting a relative movement of the tool holder with respect to said member in a direction to render said binding means active.
3. A lathe tool holder embodying a post, a member mounted upon the post and adjustable lengthwise thereof, said member being also rotatable upon the post, means for effecting such lengthwise adjustment, a tool holder carried by said member for movement therewith and with respect thereto, a binding element for binding said member against movement with respect to said post, and means other than the first recited means and including an operable element for securing a tool in said tool holder and for rendering said binding element active.
4. A lathe tool holder embodying a post, a member mounted upon the post and adjustable lengthwise thereof, means for effecting said adjustment, a tool holder carried by said member for movement therewith and with respect thereto, a binding element for binding said member against movement with respect to said post, and means including a single operable element for securing a tool in said tool holder and for rendering said binding element active, the said binding element comprising a pin carried by the said member, a portion of said tool holder contacting one end of said pin and operating to move the pin lengthwise of its axis into binding position.
5. A lathe tool holder embodying a post, a member mounted upon the post and adjustable lengthwise thereof, means for effecting said adjustment, a tool holder carried by said member for movement therewith and with respect thereto, a binding element for binding said member against movement with respect to said post, and means including a single operable element for securing a tool in said tool holder and for rendering said binding element active, said tool holder embodying a tool receiving member movable

able with and with respect to the first said member.

6. A lathe tool holder embodying two members relatively movable in directions lengthwise of their axes, means for effecting such movement, a tool holder supported by one of said members for movement therewith and with respect thereto, means other than the first said means and adapted to be rendered active by the movement of said tool holder with respect to its supporting member, for binding said members against said relative movement, and a single operable element for binding a tool in the holder and for effecting a relative movement of the tool holder with respect to its supporting member.
7. A lathe tool holder embodying two members relatively movable in directions lengthwise of their axes, means for effecting such movement, a tool holder supported by one of said members for movement therewith and with respect thereto, means other than the first said means and adapted to be rendered active by the movement of said tool holder with respect to its supporting member, for binding said members against said relative movement, and a single operable element for binding a tool in the holder and for effecting a relative movement of the tool holder with respect to its supporting member, said tool holder having an open sided seat for the tool.
8. A tool holder comprising a plurality of relatively movable parts, one of said parts having an open sided recess therein for a tool holder, said tool holder having an open side for the reception of a tool, means including a single operable element to bind the tool in said holder and also effect a relative movement of one of said parts with respect to another of said parts, and means responsive to such relative movement for effecting a binding of certain of the parts one with relation to the other.
9. A tool holder comprising a plurality of relatively movable parts, one of said parts having an open sided recess therein for a tool holder, said tool holder having an open side for the reception of a tool, means including a single operable element to bind the tool in said holder and also effect a relative movement of one of said parts with respect to another of said parts, and means responsive to such relative movement for effecting a binding of certain of the parts one with relation to the other, the last recited means embodying a pin, a portion of one of the movable parts engaging the end of said pin for moving it longitudinally.
10. A lathe tool holder embodying a post, a member mounted thereupon and movable lengthwise thereof, means for effecting such movement, a seat in said member, a tool holder mounted in said seat for movement with said member and for movement in said seat with respect to said member, a single operable element for clamping a tool in said seat and for moving said holder in the seat with respect thereto, and means responsive to the movement of said tool holder in its seat for effecting a binding of said member against movement with respect to said post.
11. A lathe tool holder embodying a post, a member mounted thereupon and movable lengthwise thereof, means for effecting such movement, a seat in said member, a tool holder mounted in said seat for movement with said member and for movement in said seat with respect to said member, a single operable element for clamping a tool in said seat and for moving said holder in the seat with respect thereto, and

means responsive to the movement of said tool holder in its seat for effecting a binding of said member against movement with respect to said post, the last said means embodying a pin carried by said member for longitudinal movement with respect thereto, a portion of said tool holder engaging an end of said pin for moving the pin longitudinally.

12. A lathe tool holder embodying a post, a member mounted thereupon and movable lengthwise thereof, means for effecting such movement, a seat in said member, a tool holder mounted in said seat for movement with said member and for movement in said seat with respect to said member, a single operable element for clamping a tool in said seat and for moving said holder in the seat with respect thereto, and means responsive to the movement of said tool holder in its seat for effecting a binding of said member against movement with respect to said post, the said tool holder having an open side through which the tool is inserted and removed.

13. A lathe tool holder embodying a post, a member mounted thereupon and movable lengthwise thereof, means for effecting such movement, a seat in said member, a tool holder mounted in said seat with respect to said member, a single operable element for clamping a tool in said seat and for moving said holder in the seat with respect thereto, means responsive to the movement of said tool holder in its seat for effecting a binding of said member against movement with respect to said post, the said tool holder having an open side through which the tool is inserted and removed, and spaced bearings in the bottom of said holder upon which the tool rests.

14. A lathe tool holder embodying a post, a member mounted thereupon and movable lengthwise thereof, means for effecting such movement, a seat in said member, a tool holder mounted in said seat for movement with said member and for movement with respect to said member, said tool holder having an open side, spaced bearing points in said seat against which the tool rests, a screw contacting said tool at a point intermediate said bearing points for securing it in said seat, and means responsive to the last said movement of said tool holder for binding the said member against movement with respect to said post.

15. A lathe tool holder embodying a post, a member mounted thereupon and movable lengthwise thereof, means for effecting such movement, a seat in said member, a tool holder mounted in said seat for movement with said member and for movement with respect to said member, said tool holder having an open side, spaced bearing points in said seat against which the tool rests, a screw contacting said tool at a point intermediate said bearing points for securing the tool in said seat, and operating also to effect a movement of the holder in its seat, and means responsive to the last said movement of said tool holder for binding the said member against movement with respect to said post, the said binding means embodying a pin one end of which is engaged and moved longitudinally by said tool holder when the latter is moved in its said seat.

16. A lathe tool post embodying a post proper, said post embodying two members secured together for relative adjustment to clamp a portion of the tool post carriage therebetween for fixedly securing the post in position, a member mounted upon said post for adjustment in directions lengthwise of the post and also for rotative

movement upon the post and about the axis thereof, means for effecting a clamping action between the last said member and said post, the said means embodying an element movable in directions lengthwise of its longitudinal dimension and in a plane inclined to the axis of the post and into engagement with the post, means for effecting such movement of said element, and a tool holder carried by the last said member.

17. A lathe tool post embodying a post proper, a shouldered screw threaded into and cooperating with one end of the post to secure the latter in position upon the tool post carriage, a member telescoped with the post for rotation thereupon and for adjustment lengthwise thereof, means for effecting such lengthwise adjustment, means carried by said member and adapted to be forced into engagement with the post for binding said member against movement with respect to the post, means other than the first said means for forcing said member against the post, and a tool holder carried by said member.

18. A lathe tool post embodying a post proper, a shouldered screw threaded into and cooperating with one end of the post to secure the latter in position upon the tool post carriage, a member telescoped with the post for rotation thereupon and for adjustment lengthwise thereof, means for effecting such lengthwise adjustment, means carried by and movable with respect to said member and adapted to be forced into engagement with the post for binding said member against movement with respect to the post, means other than the first said means for forcing said member against the post, the last said means being operatively related to the tool holder and being rendered active by the clamping of the tool in the tool holder, and a tool holder carried by said member.

19. A lathe tool post embodying a post proper, means for fixedly clamping said post to the tool post carriage, a member supported by said post for adjustment rotatively with respect to the post and also in a direction lengthwise of the longitudinal axis of the post, means for effecting such lengthwise adjustment, means carried by said member, movable with respect thereto and adapted to be forced into engagement with the post for binding said member in its adjusted position with respect to the post, means other than the first said means for rendering the last said means active, and a tool holder carried by said member.

20. A lathe tool post embodying a post proper, means for fixedly clamping said post to the tool post carriage, a member supported by said post for adjustment rotatively with respect to the post and also in a direction lengthwise of the longitudinal axis of the post, means whereby such lengthwise adjustment may be effected, means carried by said member movable with respect thereto, and adapted to be forced into engagement with the post for binding said member in its adjusted position with respect to the post, means other than the first said means for rendering the said binding means active, a tool holder carried by said member, the said binding means embodying a bodily movable element one face of the element adapted to contact said post, and means operable upon another face of said element to render the latter active.

21. A lathe tool post embodying a post proper, means for fixedly clamping said post to the tool post carriage, a member supported by said

post for adjustment rotatively with respect to the post and also in a direction lengthwise of the longitudinal axis of the post, means for effecting such lengthwise adjustment of said member and for maintaining it in its adjusted position, means carried by said member operable in a plane inclined to the axis of said post and adapted to be forced into engagement with the post for binding said member in its adjusted position with respect to the post, means independent of the first said means for rendering the said binding means active, and a tool holder carried by said member.

22. A lathe tool post embodying a post proper, means for fixedly clamping said post to the tool post carriage, a member supported by said post for adjustment rotatively with respect to the post and also in a direction lengthwise of the longitudinal axis of the post, means for effecting such lengthwise adjustment of said member and for maintaining it in its adjusted position, means carried by said member and adapted to be forced into engagement with the post for binding said member in its adjusted position with respect to the post, means separate from the first said means for rendering the said binding means active, and a tool holder carried by said member, the said member being adapted for free rotative adjustment upon the post and in the same plane in any position to which it may be adjusted lengthwise of the post.

23. A lathe tool holder embodying a post, said post embodying relatively movable members, a tool holder carried by one of said members, means between the said members of said post to effect a binding therebetween, means for securing a tool in said tool holder, means responsive to the securing of the tool holder for rendering such binding means effective, and means independent of all of the aforesaid means for securing the other member of said post upon and against movement with respect to a tool post carriage.

24. A lathe tool holder embodying a post, said post embodying relatively movable members, a tool holder carried by one of said members,

means between the said members of said post to effect a binding therebetween, means for securing a tool in said tool holder, means responsive to the securing of the tool in the tool holder for rendering said binding means effective, and means independent of all of the aforesaid means for securing the other member of said post upon and against movement with respect to a tool post carriage, the said binding means embodying an independent element adapted to contact the side face of one of the post members, and operable in a plane inclined to the axis of the post.

25. A lathe tool holder embodying a post, said post embodying relatively movable members, a tool holder carried by one of said members, means between the said members of said post to effect a binding therebetween, means for securing a tool in said tool holder, and means responsive to the securing of the tool in the tool holder for rendering said binding means effective, the said binding means embodying an independent element adapted to contact the side face of one of the post members, and operable in a plane inclined to the axis of the post, the said element being concealed and housed in one of the said post members.

26. A lathe tool holder embodying a post, said post embodying relatively movable members, a tool holder carried by one of said members, means between said members of said post to effect a binding therebetween, said tool holder embodying a member movable with and with respect to one of the first said members, means operable to secure a tool in said tool holder and to move the said tool holder member with respect to its support, the said binding means embodying an element carried by one of the tool post members and adapted to engage the other tool post member, a portion of said tool holder member being adapted to engage and move said element, and means independent of all of the aforesaid means for securing the other member of said post upon and against movement with respect to a tool post carriage.

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