F. K. HENDRICKSON.

FACE PLATE LOOSENING DEVICE FOR LATHES.

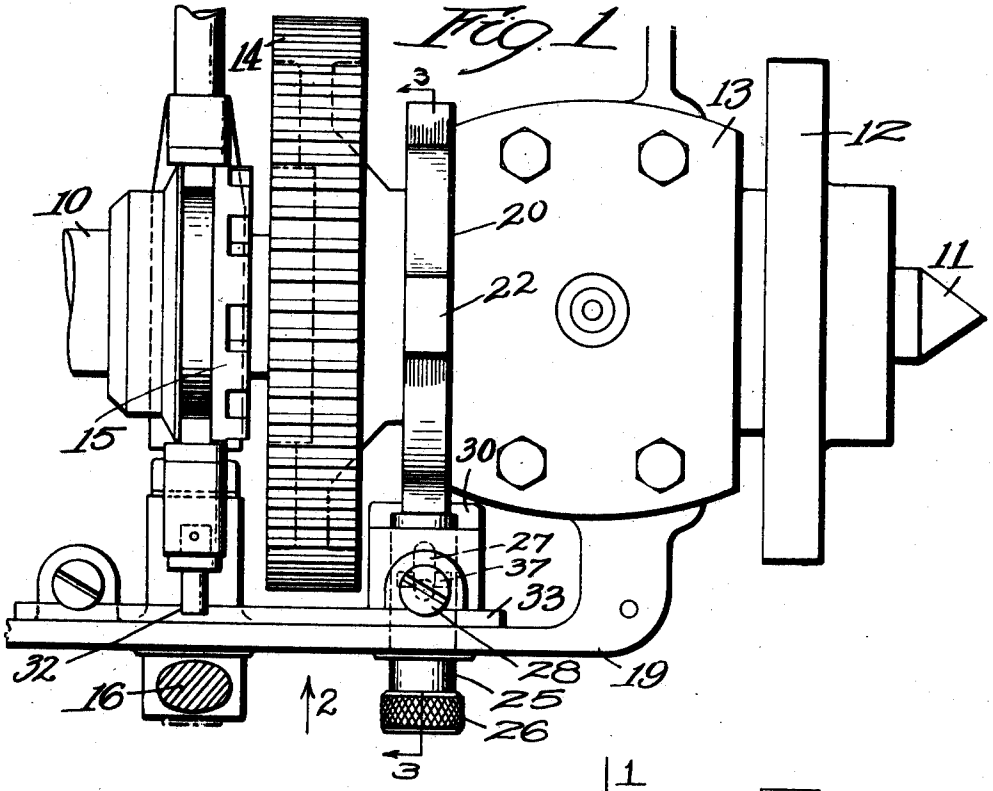
APPLICATION FILED NOV. 7, 1919.

1,365,826.

Patented Jan. 18, 1921.

2 SHEETS—SHEET 1.

Fig. 1



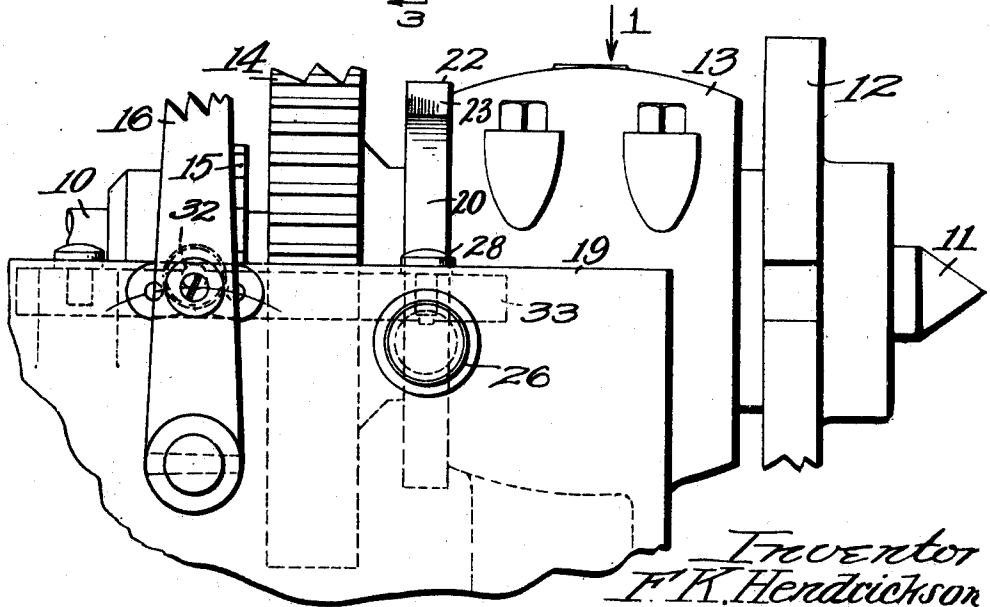


Fig. 2.

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2 SHEETS—SHEET 2.

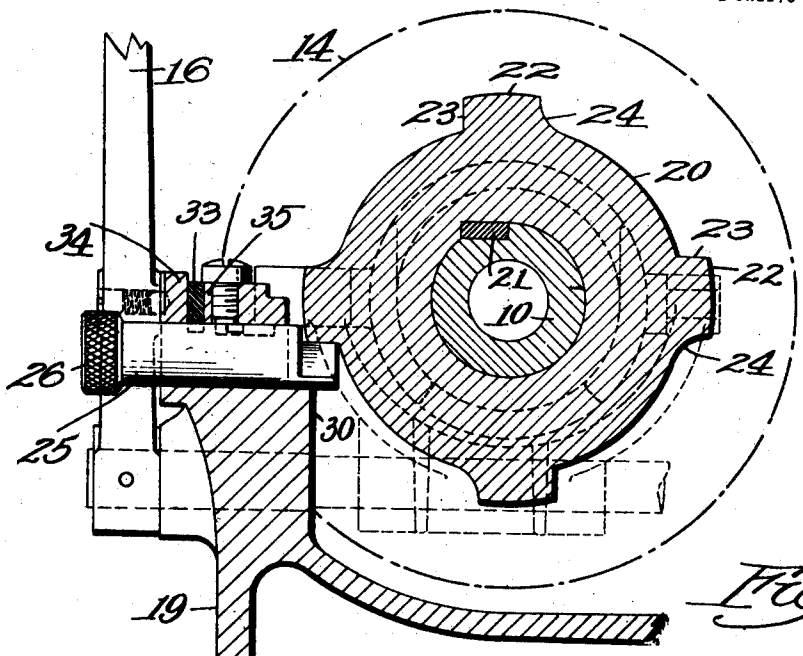


Fig. 3.



Fig. 6.

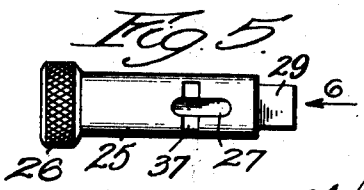


Fig. 5.

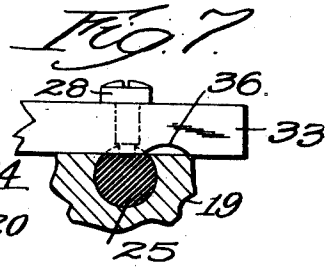


Fig. 7.

Fig. 4.

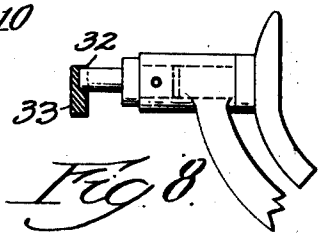


Fig. 8.

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UNITED STATES PATENT OFFICE.

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FACE-PLATE-LOOSENING DEVICE FOR LATHES.

1,365,826. Specification of Letters Patent. Patented Jan. 18, 1921.

Application filed November 7, 1919. Serial No. 336,421.

To all whom it may concern:

Be it known that I, FRED K. HENDRICKSON, a citizen of the United States, residing at Worcester, in the county of Worcester and State of Massachusetts, have invented a new and useful Face-Plate-Loosening Device for Lathes, of which the following is a specification.

This invention relates to a device for application to a geared head or other lathe to afford a solid and positive surface against which blows imparted to a face plate for removing it will be transmitted and also for the purpose of preventing the throwing in of the gears when the locking device is in position for operation.

It is well known that the face plate of a lathe is subjected to hard usage and is screwed up on the spindle in such a tight way that it is very difficult to start it off the screw-threads in many cases. In order to loosen it it is subjected to heavy blows and these are transmitted to the gearing and of course from one gear to another by only two or three teeth. Various shop expedients have been employed to hold the gear on the spindle when the face plate is to be removed, but these all depend upon the blocking of the bearing by means of its teeth so far as I am aware. Therefore they tend to injure one gear at least.

By this invention means is provided which will constitute a positive stop against the turning of the spindle or its gear and prevent the pressure of the blows administered to the head stock from being transmitted to any of the gears, and furthermore, when it is in position for operation it prevents the throwing in of the gears so that no accident can happen from such a combination of actions.

The invention is very simple, it does not take up any appreciable amount of room on the head; and can be applied to many types of lathes and similar machines.

Reference is to be had to the accompanying drawings, in which—

Figure 1 is a plan of a head stock with a preferred embodiment of this invention applied thereto, the cover being removed;

Fig. 2 is a side view thereof;

Fig. 3 is a transverse sectional view on the line 3—3 of Fig. 1;

Fig. 4 is a similar view with the parts in a different position;

Fig. 5 is a plan of the locking bolt;

Fig. 6 is an end view thereof;

Fig. 7 is a sectional view on the line 7—7 of Fig. 4, and

Fig. 8 is a side view of the clutch operating yoke showing the slide in section.

The invention is shown as applied to a well known type of head stock, but it can be employed on others as will be understood readily. The usual spindle 10, head center 11, face plate 12, and spindle bearing 13 as well as the spindle driving gear 14 are shown. This gear is also shown as being adapted to be connected positively with the spindle 10 by means of a clutch 15 operated by handle 16 on the outside of the casing, this handle being capable of oscillating from forward to rear clutching positions through neutral position at the center as is well known in this art.

For the purpose of this invention I positively key to the spindle 10 a hardened steel disk 20, a key 21 being shown for that purpose. This disk is provided with a number of projections 22, four being shown, but any number can be used. Four is a convenient number to permit of applying the mechanism hereinafter described for the purpose intended without necessitating the turning of the spindle more than a quarter of a revolution in order to loosen the face plate.

It will be noted that these projections 22 are each provided with a flat forward face 23 and are strengthened at the rear by the gradual curve indicated at 24 so that they constitute strong and positive abutments.

On the head stock casing 19, and projecting through it, I place a push bolt 25 having a knurled head 26 for operating it and limited to two positions by means of a slot 27 and screw or pin 28. This bolt is either forced in or pulled out and when it is forced in the end, which is flattened off at the top at 29, enters one of the spaces between a surface 24 and the next surface 23. Therefore when the spindle turns less than a quarter of a revolution, in the present case, one of the abutting surfaces 23 will come up against the flat surface 29 at the end of this bolt. This flat surface is backed up from the fact

that the casing 19 is provided with a projection 30 which has a curved surface that fits the rear of the bolt 25 and constitutes a solid and rigid backing for it. This receives the blows imparted to the face plate in loosening it from the screw thread on the spindle.

For the purpose of preventing the bolt 25 from being pushed in when the handle 16 is in anything but neutral position and also for preventing the handle from being moved out of neutral position when the bolt 25 is pushed in, I pivotally connect with the handle 16 at the point 32, a slide 33. This moves between guides 34 and 35, and is provided on its lower surface with an arc-shaped notch 36. This notch registers with the cylindrical surface of the bolt 25 when the handle 16 is in neutral position and unless in exact registration it will not permit the bolt to be pushed in. When the bolt is pulled out the slide 33 rests in a transverse notch 37 through the top of the bolt 25. Then the handle can be moved and either gear clutched to the shaft as usual. But if the bolt is pushed in the handle cannot be moved from neutral position (see Figs. 2 and 3). Furthermore unless the handle 16 is in neutral position the notch 36 is out of registration with the cylindrical surface of the bolt 25 (see Fig. 7), and will prevent the bolt from being moved. In this way the device is made safe against stripping the gears by turning on the power while the bolt is in operative position and against the pushing in of the bolt when the power is or can be turned on to operate the spindle through either of its gears. It is to be understood that the turning of the spindle through the smaller gear at a high speed is prevented in the same way, although that is not here illustrated in detail.

Although I have illustrated and described only a single form of the invention I am aware of the fact that modifications can be made therein by any person skilled in the art without departing from the scope of the invention as expressed in the claims. Therefore I do not wish to be limited to all the details of construction herein shown and described, but what I do claim is:—

1. The combination with a lathe head spindle, of means to hold it against rotation when desired, said means comprising a disk secured on the spindle and having one or more shoulders or projections on its periphery, and a bolt slidable in the lathe head transversely to the spindle and having a flattened end adapted to engage said shoulders or projections, the bearing for the bolt in the head being extended under said flattened portion.

2. The combination with a lathe spindle and gearing including a clutch for driving the same, of a slidable bolt for holding the spindle against rotation when desired, and a member movable with said clutch and engaging said bolt to prevent it from being moved into locking position when the clutch is in engagement.

3. The combination with a lathe spindle and gearing including a clutch for driving the same, of a slidable bolt for holding the spindle against rotation when desired and provided with a transverse notch, and a slidable member movable with said clutch and engaging said notch when the bolt is retracted, said member having a curved notch engaging the surface of said bolt when the clutch is in neutral position, whereby the spindle cannot be locked against rotation when the clutch is in, and the clutch cannot be thrown in when the spindle is so locked.

4. The combination with a lathe spindle having a face plate screwed thereon, of a disk fixed to said spindle and having a projection, and a bolt having a surface adapted to be located on the path of said projection for preventing rotation of the spindle, a casing in which said spindle is journaled, said casing having a projection inside having a surface fitting said bolt at a point behind the surface of the bolt which is engaged by the projection for backing up the bolt.

5. The combination with a spindle having a face plate screwed thereon, of a disk fixed to said spindle and having a projection, a reciprocable bolt adapted to be moved into the path of said projection for preventing rotation of the spindle, gearing for operating said spindle, a clutch for controlling the connection of said gearing with the spindle, a handle for operating the clutch, and means whereby the bolt cannot be moved into operative position unless the clutch and handle are in neutral position.

6. The combination of a spindle, a face plate screwed thereon, a disk fixed to said spindle and having a projection, a bolt adapted to be located in a position for engaging the projection and preventing rotation of the spindle, gearing for operating said spindle, a clutch for controlling the connection of said gearing with the spindle, a handle for operating the clutch, and means whereby the bolt is free to be moved into said position when the clutch and handle are in neutral position and whereby when said handle and clutch are out of neutral position the bolt is prevented from being pushed into said position.

7. The combination with a lathe spindle having a face plate screwed thereon, of a projection extending from the spindle, a bolt adapted to be located in the path of said projection preventing rotation of the spindle, gearing for operating said spindle, means for controlling the connection of said gearing with the spindle, a handle for operating said means, and means whereby said

handle cannot be moved into operative position unless the bolt is drawn back.

8. The combination with a lathe spindle having a face plate thereon, of a projection extending from the spindle, a bolt having a surface adapted to be located in the path of said projection for preventing rotation of the spindle, said bolt being reciprocable, gearing for operating said spindle, means for controlling the connection of said gearing with the spindle, a handle for operating said means, means whereby the bolt cannot be moved into operative position unless the handle is in neutral position, and means whereby said handle cannot be moved into operative position unless the bolt is drawn back.

9. The combination with a lathe spindle and a face plate screwed thereon, of a disk fixed to said spindle and having a projection, a bolt having a transverse notch and adapted to be moved into position for engaging the projection and preventing rotation of the spindle, gearing for operating said spindle, a handle for controlling the connection of the gearing with the spindle, and a member connected with said handle and movable therewith in said notch, said member having a notch positioned with respect to the bolt for allowing the bolt to pass through it when the handle is in neutral position.

10. The combination with a lathe spindle and a face plate screwed thereon, of a disk fixed to said spindle and having a projection, a bolt having a notch and adapted to be moved into the path of said projection preventing rotation of said spindle, gearing for operating said spindle, a clutch for controlling the connection of said gearing with the spindle, a handle for operating the clutch, a slide connected with said handle and movable through said notch for preventing the movement of the bolt to operative position, said slide having a notch for allowing the bolt to be operated when the handle is in neutral position, the notches in the bolt and in the slide registering with the slide and bolt respectively when the handle is neutral and the bolt is withdrawn, this being the only position of the parts from which both the handle and bolt can be moved, without first moving the other.

In testimony whereof I have hereunto affixed my signature.

FRED K. HENDRICKSON.