(No Model.) 3 Sheets—Sheet 1.

F. H. RICHARDS.

STOP MECHANISM FOR TURRET LATHES.

No. 496,065. Patented Apr. 25, 1893.

Fig. 1

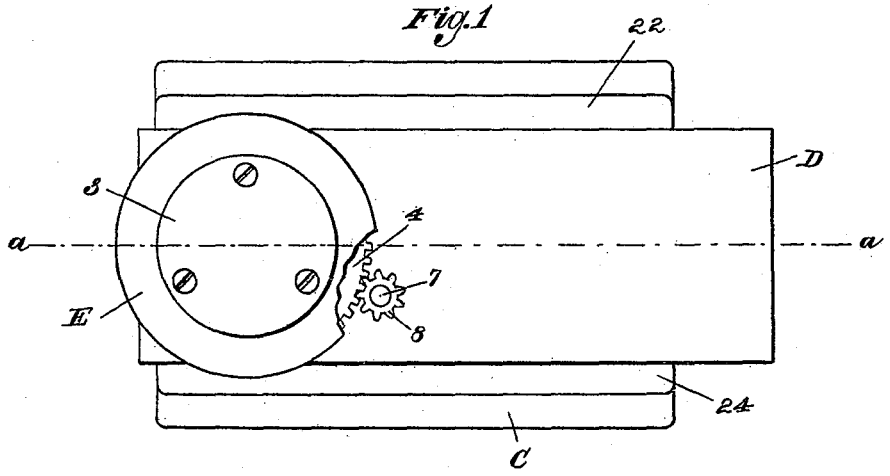

Fig. 2

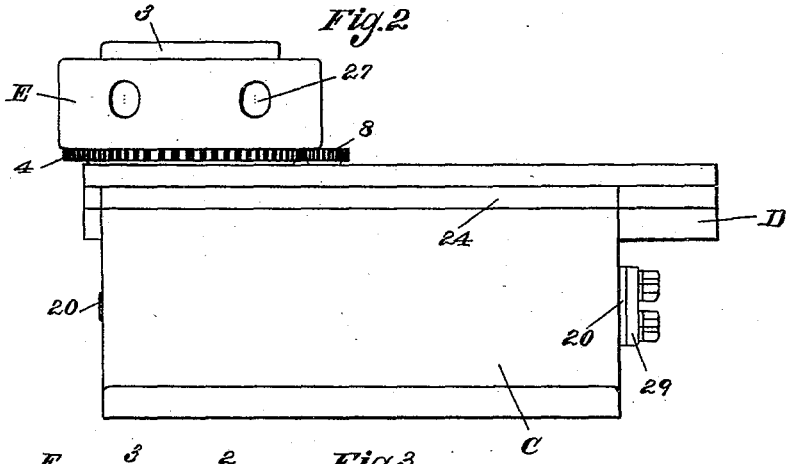

Fig. 3

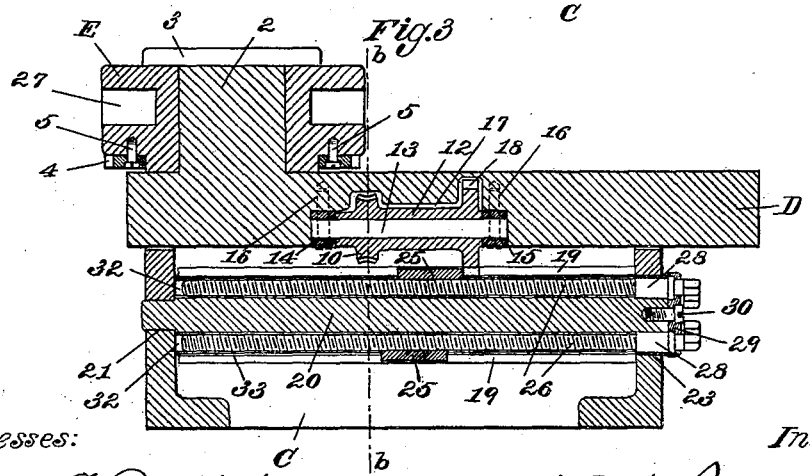

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Fig. 4

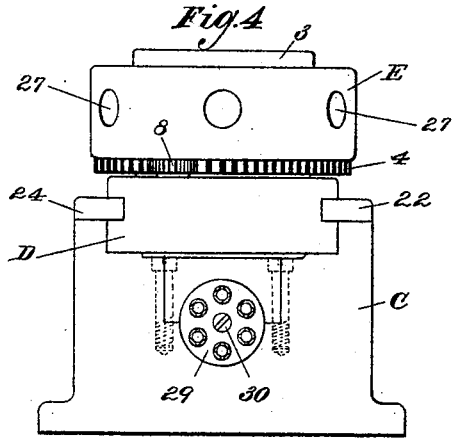
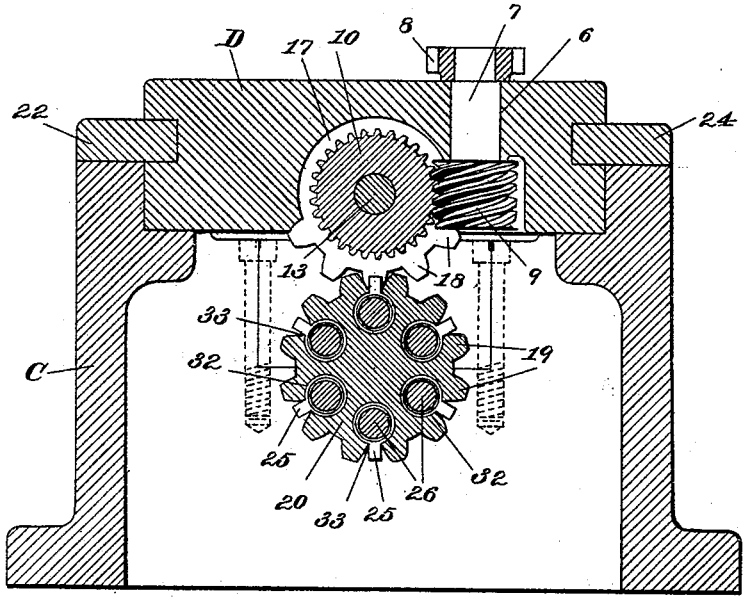


Fig. 5



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(No Model.) 3 Sheets—Sheet 3.

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STOP MECHANISM FOR TURRET LATHES.

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Fig. 6

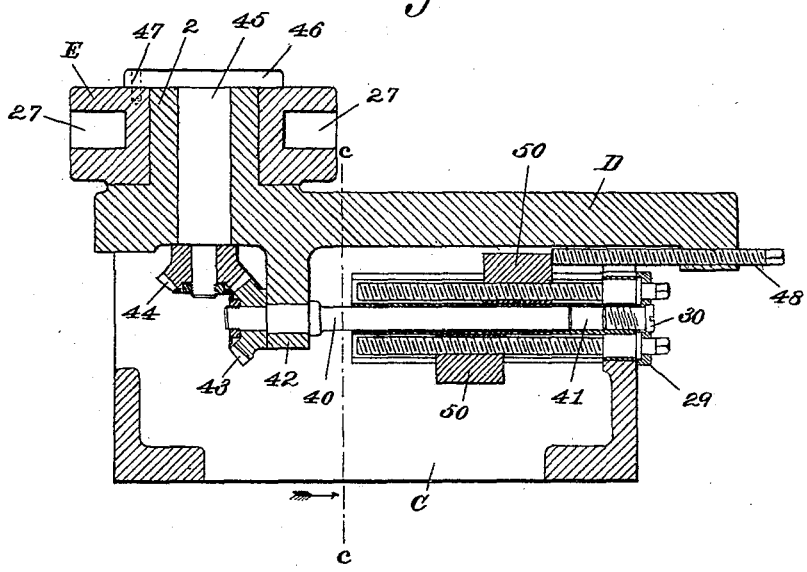


Fig. 7

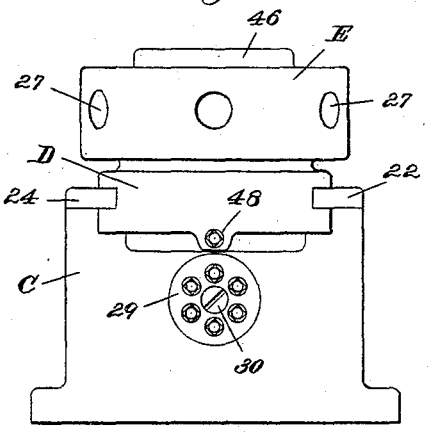
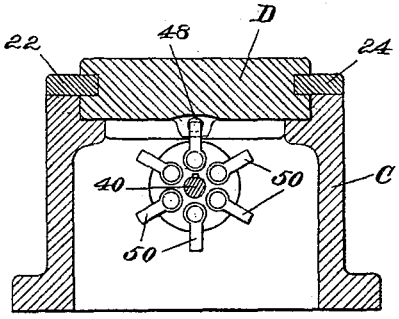


Fig. 8



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STOP MECHANISM FOR TURRET LATHES.

SPECIFICATION forming part of Letters Patent No. 496,065, dated April 25, 1893.

Application filed March 29, 1892. Serial No. 426,951. (No model.)

To all whom it may concern:

Be it known that I, FRANCIS H. RICHARDS, a citizen of the United States, residing at Hartford, in the county of Hartford and State of Connecticut, have invented certain new and useful Improvements in Stop Mechanisms for Turret-Lathes, of which the following is a specification.

This invention relates to stop mechanisms for the slides of turret-lathes; the object being to furnish a stop-mechanism having a multiplicity of adjustable stops, one for each tool carried by the turret, so that the stroke of each tool may be regulated and limited independently of the other tools of the set.

My present invention is in the nature of an improvement on the stop-mechanism described in prior Letters Patent No. 481,192, dated August 23, 1892.

In the drawings accompanying and forming a part of this specification, Figure 1 is a plan view of the slide-block, turret-slide and turret of a turret-lathe furnished with my improvements. Fig. 2 is a front elevation of the same. Fig. 3 is a central vertical section, in line *a a*, Fig. 1. Fig. 4 is an end elevation as seen from the right-hand of Fig. 2. Fig. 5 is an enlarged cross-sectional view, on the line *b b*, Fig. 3, as seen from the left-hand in said figure. Fig. 6 is a view, similar to Fig. 3, of a modified form of the mechanism. Fig. 7 is an end elevation of the same, as seen from the right-hand of Fig. 6. Fig. 8 is a cross-sectional view on the line *c c*, Fig. 6, as seen from the left-hand in said figure.

The slide-block, C, is in a general way substantially the same as the slide-blocks of ordinary turret-lathes, being fitted to receive the turret-slide, and to be fixed to the bed of a lathe in the usual manner. The turret-slide, D, is arranged to slide in ways formed in said block, and is or may be held in place thereon by the usual straps, 22 and 24. The turret E is removably supported on the forward end of said slide by means of a stud, or column, 2, which I have shown formed integral with said slide, after the manner described in Letters Patent No. 480,962, granted to me August 16, 1892. Said turret is bored to fit closely, but to normally turn freely, on said column, and a suitable cap, as 3, is provided for holding the turret in place thereon. The set of slide-stops, corresponding to the divisions of the turret, are carried by a stop-cylinder which is pivotally supported in the slide-block, and is actuated through suitable connecting mechanism (as, for instance, a system of gearing), from the turret to have corresponding movements therewith. Where the proportions and arrangement, in any particular instance, of the principal parts will permit of it, the cylinder-actuating gearing may consist of ordinary bevel-gears, as illustrated in Fig. 6; but I prefer to use the system of spur and worm wheels illustrated in Figs. 1 to 5, inclusive. Referring to said Figs. 1 to 5, the turret E is shown provided with the turret-gear 4, which is fixed to the under side of the turret by means of suitable screws, as 5, or otherwise. The slide D is bored at 6, Fig. 5, to receive the worm-shaft 7, to whose upper end is fixed a pinion, 8, that meshes with said turret-gear 4; to the lower end of said shaft 7 there is fixed or formed thereon a worm, 9, which meshes with a worm-wheel, 10, that is carried by a sleeve, 12, journaled on the shaft 13. As a convenient means for supporting the shaft 13 in the slide, this shaft is shown carried by the bearings, or blocks, 14 and 15, which are fixed to the slide D by means of suitable screws, 16. The shaft 13 and the parts carried thereon lie within a recess, 17, which is formed in the slide for that purpose. The sleeve 12, in addition to the wheel 10, also carries a spur-wheel, 18, acting as a stop-wheel, whose teeth mesh with the ribs, or teeth, 19, that are formed on, and longitudinally of, the stop-cylinder 20. This cylinder is journaled at 21 and 23 in the front and rear end-walls, respectively, of the slide-block C, and is connected to receive a series of stops, 25, together with the stop-actuating screws 26. Said stops should be equal in number to the divisions of the turret, each division having a separate stop corresponding thereto, and which may be set independently of the other stops, to limit the forward movement of the turret-slide.

As a means for properly holding the stops 25 in place, these are fitted into "under-cut" grooves, as 32, formed in the carrier 20, and opening outwardly, through slots, 33, into the

spaces between the aforesaid teeth, 19, of the carrier. The projecting portion of the sliding stop stands within said tooth-space, and strikes the tooth of the gear 18, as will be understood from comparison of Figs. 3 and 5. By means of the construction described, the stops (these projecting through said slots as shown) are prevented from turning on their respective actuating-screws, 26; which screws are journaled at 28 in the rearward end of the carrier 20, being held in place longitudinally by the cap 29 and its binding-screw 30. As shown in Fig. 3, the screws 26 extend (or may extend) substantially the whole length of the stop-carrier, thereby obtaining the greatest range of movement for the several stops. By this means one stop may be set to limit the forward movement of the slide D to the position shown in Figs. 1, 2 and 3; while another stop may be set much farther toward the left-hand in said figures, for a much longer slide-stroke.

It will, of course, be understood that the stops are brought successively into working position at the upper side of the carrier in Figs. 3 and 5, on the turning of the turret to bring the successive tool-sockets, 27, of the turret to the forward end of the turret-slide. For this purpose, the gearing intermediate to the stop-cylinder and the turret is so proportioned that the turret and stop-carrier will have corresponding rotary movements.

In the more simple form of my improvements shown in Figs. 6, 7 and 8, the stop-carrier, together with its stops and the means for adjusting the same longitudinally of the carrier, is substantially the same as described in connection with Figs. 1 to 5, inclusive; but the intermediate gearing for actuating the stop-carrier from the turret consists in this instance of the following details: The splined shaft 40 is fitted to slide within the bore 41 of the stop-carrier, the outer end of said shaft being journaled in the bearing 42 projecting from the under side of the turret-slide D; to this shaft is fixed the gear 43, which meshes with a corresponding gear, 44, that is fixed to the lower end of a shaft, 45, journaled in the turret-slide and connecting at its upper end, through the flange 46 and dowel-pin 47, with the turret E. On the sliding of the turret-slide upon the slide-block C, the splined shaft 40 slides within the bore 41 of the stop-carrier, thereby maintaining the proper operative connection between said turret and stop-carrier. In this form of the mechanism, the slide D is shown furnished with the stop-screw 48 for regulating the position of the turret-slide independently of the adjustment of the stops 50 on the stop-carrier. For said adjustable stop 48 there may be substituted an ordinary fixed stop (not herein shown) for engaging the described adjustable stops on the revoluble stop-carrier. The mode of operation of the modification here described, being substantially the same as that of the preferred construction shown in Figs. 1 to 5, inclusive, will, it is thought, be fully understood without further explanation.

Having thus described my invention, I claim—

1. In a stop-mechanism for turret-lathes, the combination with the turret-slide and its supporting slide-block, of the turret revolubly mounted on said slide, the revoluble stop-carrier provided with a series of stop-ways and supported in the slide-block longitudinally of the slide-movement, a series of sliding stops independently adjustable longitudinally of said ways, and gearing connecting the stop-carrier with the turret on the slide, whereby the series of stops may be successively brought into working position, substantially as described.

2. In a stop-mechanism for turret-lathes, the combination with the turret-slide and its supporting slide-block, of the turret revolubly mounted on said slide, the revoluble stop-carrier provided with a series of stop-ways and supported in the slide-block longitudinally of the slide-movement, a series of stops adjustable longitudinally of said carrier, stop-actuating screws journaled in the stop-carrier for sliding said stops, connecting gearing intermediate to the stop-carrier and turret for imparting corresponding rotary movements thereto, and a single adjustable stop on the turret-slide for engaging successively the series of stops on the stop-carrier, substantially as set forth.

3. In a stop-mechanism for turret-lathes, the combination with the turret-slide and its supporting slide-block, of the turret revolubly mounted on said slide, the revoluble stop-carrier supported in the slide-block longitudinally of the slide-movement and having thereon a series of ribs serving as gear-teeth, a series of stops substantially as described adjustable longitudinally of said carrier, and connecting-gearing substantially as described intermediate to the turret and said carrier, for rotating said carrier by engagement with the said teeth thereof, substantially as described.

4. In a stop-mechanism of the class specified, the combination with the turret-slide having the turret revolubly mounted thereon, and with the revoluble stop-carrier, supported independently of the slide, of the shaft 7 carried by the turret-slide, gearing operatively connecting said shaft with the turret, and gearing operatively connecting said shaft with the stop-carrier, whereby the turret and stop-carrier have corresponding rotary movements, substantially as set forth.

5. In a stop-mechanism of the class specified, the combination with the turret-slide and its adjustable stop, of the revoluble stop-carrier having a series of under-cut grooves longitudinally thereof, a series of stops fitted to slide in said grooves and projecting therefrom to engage the turret-slide stop, and

means for adjusting the carrier-stops independently of each other, substantially as described.

6. In a stop-mechanism of the class specified, the combination with the turret-slide and with the turret revolubly mounted thereon, of the revoluble stop-carrier having independently-adjustable stops, and having ribs longitudinally of the carrier serving as gear-teeth for rotating the same, the stop-wheel carried by the turret-slide and engaging said carrier teeth and stops, and gearing connecting said stop-wheel and turret to have corresponding rotary movements, substantially as described.

7. In a stop-mechanism of the class specified, the combination with the turret-slide having the turret revolubly mounted thereon, and with the revoluble stop-carrier having a series of stops and having gear-teeth longitudinally of the carrier, of the turret-gear 4 fixed on the turret, the stop-wheel having teeth meshing with the stop-carrier, and gearing substantially as described intermediate to and connecting said turret-gear and stop-gear, substantially as set forth.

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