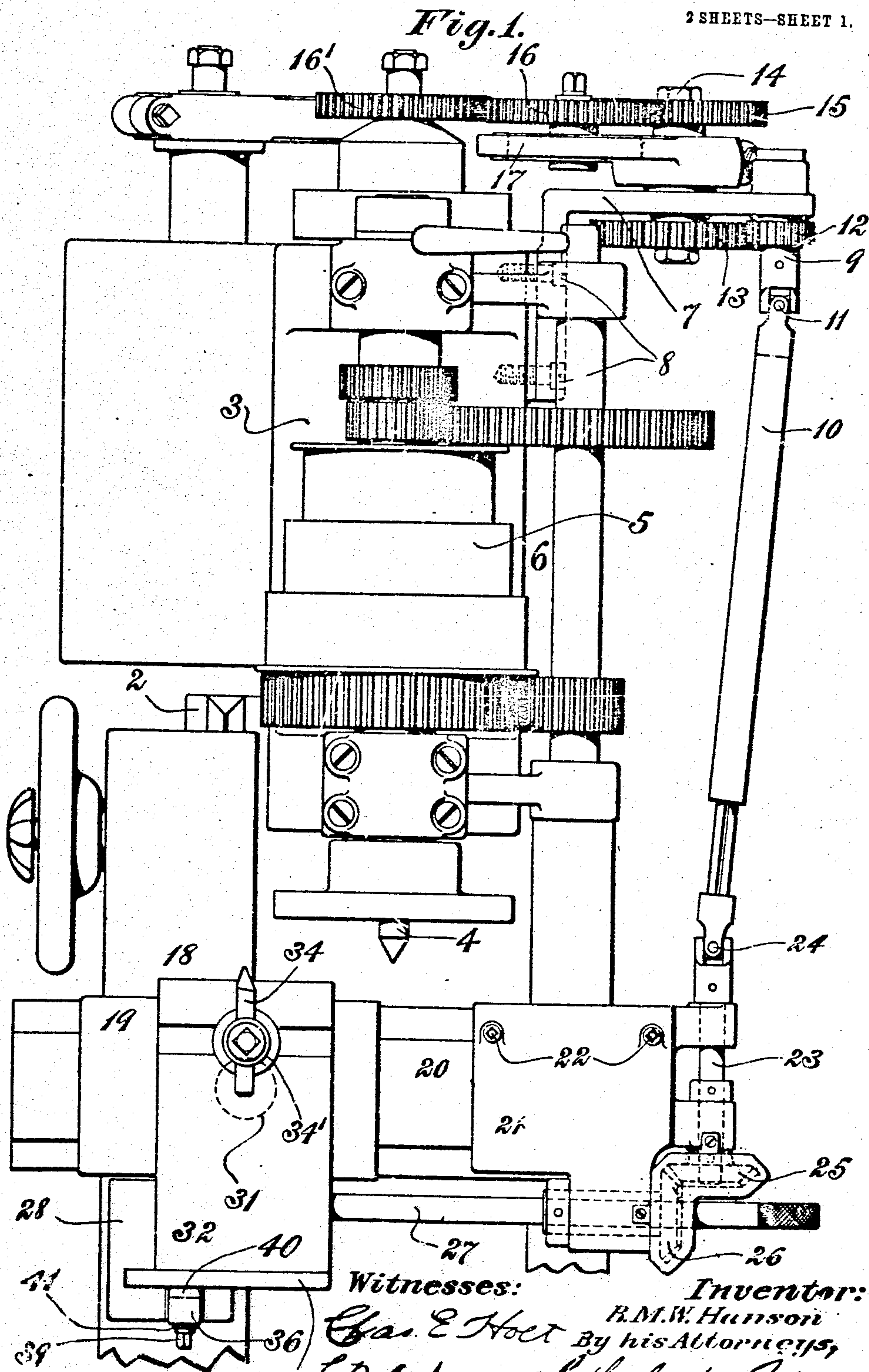


B. M. W. HANSON.
RELIEVING ATTACHMENT FOR LATHES.
APPLICATION FILED SEPT. 2, 1909.

955,643.

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2 SHEETS—SHEET 1.



UNITED STATES PATENT OFFICE.

BENGT M. W. HANSON, OF HARTFORD CONNECTICUT, ASSIGNOR TO PRATT & WHITNEY COMPANY, OF HARTFORD, CONNECTICUT, A CORPORATION OF NEW JERSEY.

RELIEVING ATTACHMENT FOR LATHES.

955,643.

Specification of Letters Patent. Patented Apr. 19, 1910.

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To all whom it may concern:

Be it known that I, BENGT M. W. HANSON, 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 Relieving Attachments for Lathes, of which the following is a specification.

This invention relates to relieving attachments for lathes, the object of the invention being to provide a simple and effective device of this character which can be readily and quickly applied to lathes of existing types without any material or practical modification or change thereof.

A lathe equipped with the attachment can be utilized with facility for relieving various kinds of tools but more especially what are known as counterbores.

In the drawings accompanying and forming part of the present specification I represent in detail one convenient form of embodiment of the invention which I will fully set forth in the following description this definite disclosure being made so that those skilled in the art can practice the invention but as will be obvious I do not restrict myself to the showing thus made for certain variations may be adopted within the scope of my invention as expressed in the claims succeeding said description.

Referring to said drawings, Figure 1 is a top plan view of the head end of a lathe provided with an attachment including my invention. Fig. 2 is a side elevation of a portion of the carriage, certain slides of the lathe, and some of the members of the attachment, partially in section, and, Fig. 3 is a top plan view partially in section of a swivel member and certain adjunctive parts hereinafter fully described.

Like characters refer to like parts throughout the several figures.

In Fig. 1 of the drawings I have illustrated somewhat fully the head portion of a lathe of known construction for which reason those parts which are old will be but briefly described. The numeral 2 denotes the bed of the lathe and 3 the head-stock provided with the work-spindle 4 the driving means for which consist of the usual

cone-pulley 5 and back-gearing denoted in a general way by 6.

I have represented as a part of the attachment a bracket which is detachably connected in some suitable manner with the bed 2 and a bracket as 7 answers my purpose and while the same may be of any desirable form it is shown as being angular one branch or the body thereof being connected by screws as 8 or otherwise with one side of the bed 2 near the head end of the bed 2. The outwardly extending branch of said bracket 7 serves as a convenient means for supporting a stud-shaft as 9 to which one end of a telescopic shaft as 10 is connected by a universal joint as 11 said stud shaft having preferably fixed thereto a pinion 12 shown as in mesh with a spur-gear 13 on one end of a stud-shaft as 14 the opposite end of said stud-shaft 14 having fixed thereto a pinion 15 constituting part of the change gearing. The pinion 15 is shown as being in mesh with the spur-gear 16 rotatively supported by the yoke or bar 17 which swings as is usual about and is supported by the stud-shaft 14. The spur-gear 16 is shown as being in mesh with the pinion 17 driven from the work-spindle 4 in the customary manner. By dismounting the gears 15 and 16 and putting others in their stead the ratios of movement of the spindle 4 and telescopic or extensible shaft 10 may be varied, the relative velocities of said spindle and shaft depending upon the flutes or analogous devices upon a counterboring or other tool being relieved.

The carriage or main-slide of the lathe is designated in a general way by 18 the bed 2 being equipped with ways to permit the movement of said carriage longitudinally of said bed. The carriage 18 supports for movement a cross-slide as 19 through the intervention of a transversely-disposed way as 20 the latter being shown as consisting of a plate dovetailed upon its upper and lower sides to fit correspondingly shaped channels in the carriage and cross-slide respectively, and fastened adjustably in some suitable manner to the carriage. The way or plate 20 constitutes a suitable support for a plate 21 the latter being detachably held in position

by screws as 22. The plate 21 is shown as having upon the outer side thereof bearings for a shaft 23 connected by a universal joint as 24 with the telescopic shaft 10. It will therefore be apparent that when the carriage 18 is moved back and forth the plate 21 will move in the same direction as in effect it is rigidly connected with said carriage, the consequence being that the telescopic shaft 10 will elongate or shorten the particular action depending upon the direction of movement of said carriage. The short shaft 23 is shown as having fastened thereto a bevel gear 25 in mesh with a bevel gear 26 fastened to one end of the transversely-disposed shaft 27 which is supported jointly by bearings on or in the plate 21 and block 28 detachably connected by screws as 29 or otherwise, with the carriage 18.

The cross slide 19 is shown as supporting for swinging movement a swivel member as 30 which moves about a vertical axis, a pivot 31 being shown to permit this action. Said swivel member 30 constitutes a suitable support for an auxiliary or tool-slide 32 which moves in a direction corresponding substantially with the length of the bed 2. When the relieving attachment is not in place this auxiliary or tool slide is fed back and forth on the swivel member by means of a screw and nut, the screw being omitted although the nut is shown being denoted by 33. I have not shown the means for holding the swivel member in an angularly adjusted position or in the position it occupies when the attachment is not being used as the same is well known. By virtue of the swinging or swivel member 30 the angular disposition of the tool 34 relative to the work may be varied and said tool may be carried by the customary post 34' adjustably supported in the usual manner upon the tool-slide 32. It should be stated that the shaft 27 has a splined connection with the bevel gear 26 so that as said shaft moves endwise on the motion of the cross slide there will always be a proper driving relation between said shaft and the telescopic shaft 10. In the present case I provide cam and spring mechanisms for giving to the auxiliary slide 32 a reciprocatory movement, the cam means being preferably employed to impart to said auxiliary slide a working stroke during which the tool thereon is making a relieving cut while the spring means retracts said auxiliary slide, both means acting through suitable agents, as will hereinafter more particularly appear.

The auxiliary or tool-slide 32 is furnished at its rear with a pendent flange or plate 35 to which a thrust in one direction is applied by a cam-operated lever as 36 in opposition to spring means. Said lever 36 is shown as being of angle or elbow form and

as pivoted at its elbow as at 37 in a slot formed in the detachably-mounted block 28. The upper and substantially vertically-disposed arm of said lever 36 is shown as having an elongated slot 38 to receive a screw 39 tapped into a shoe as 40 which bears in the present case against the outer face of the flange or plate 35 and which is partially fitted in said slot 38. The working end of said shoe 40 is somewhat rounded or approximately spherical to get the best possible effect therefrom. Between the head of the screw 39 and the lever 36 I interpose a washer 41 serving its usual function. It will be evident that when the upper arm of said lever 36 is rocked forward or toward the left in Fig. 2 it will move the auxiliary slide inward. By adjusting the shoe 40 toward or from the axis of motion of said lever 37 I can adjust the amount of working or advance stroke of the auxiliary slide. As will be evident by slightly backing out the screw 39 the shoe 40 can be adjusted and when the adjustment is secured the screw will be tightened up. The length of the flange or plate 35 exceeds the width of the auxiliary or tool slide 32 by reason of which I get a wide range of adjustment to permit me to relieve tools which vary considerably in diameter and owing to the fact that the head of the shoe 40 is rounded or spherical there will be no undue friction between said shoe and plate or flange 35 as the latter is moved with respect to the former cross-wise of the lathe.

Fastened to the shaft 27 is a cam as 42 and said cam is shown as having two effective portions 43 opposite to each other and two releasing portions 43', the effective portions of said cam being adapted to successively engage the lower or practically horizontal arm of the lever 36 so as to swing the upper arm of said lever inward to advance the auxiliary slide 32 and thereby cause the tool 33 to make a relief cut on the tool or blank being operated upon this operation being familiar in the art so that a further detailed description of the same is not necessary. The lower arm of the lever 37 may be equipped with a wear plate 44 against which the wipe of the two portions 43 of the cam 42 are directed. When a releasing portion 43' of said cam comes opposite the lower arm of said lever 36 the auxiliary slide 32 is free to be retracted by the power of the spring means to which I have alluded. I will now set forth the spring means shown for this purpose.

I have shown as separably attached to the inner face of the flange 35 a block 45 screws being shown for the purpose and said block has open-ended bores 46 to receive spring-plungers as 47 the push springs of which are denoted by 47' and which springs serve

to retract through the plungers the auxiliary or tool-slide 32. The spring-plungers are virtually carried by the slide 32 and apply their effect to the swivel member 5 which during the relieving operation is fixed relatively to said slide 32 against movement in all directions, it being well-known that when relieving said swivel member is solidly clamped with its longitudinal axis in parallelism with that of the bed 2. It therefore follows that on the advance of the slide 32 by the cam 42 acting through the intermediate parts in the manner previously described the spring-plungers 47 are forced 15 into their bores or seats 46 the consequence being that the springs 47' are compressed or put under tension so that when a releasing portion 43' of the cam 42 comes opposite the lower or horizontal arm of the lever 36 20 the said spring-plungers, the springs of which are then under maximum tension, can forcibly and rapidly draw, through the intermediate parts, the slide 32 backward and carry the tool thereon away from the 25 work.

When the lathe is used for ordinary purposes the bracket 7, plate 21, plate 35, and block 28 will be removed together with the parts which they support and when these 30 parts are taken away the lathe will be practically like the well-known type.

The attachment as an entirety or unit can be applied to ordinary lathes the only change necessary being to tap properly positioned holes therein to receive the appropriate binding screws assuming that this is 35 the means used for holding the removable parts in place. Then also the attachment might if desired be made a permanent part of the lathe. I desire also to state that in 40 the present case the relieving feed movement is applied to the auxiliary or tool-slide and not to the cross-slide the latter being as is well-known a heavy and cumbersome part 45 these conditions being augmented by reason of the members supported by said cross-slide. The consequence of all this is that I can get more efficient results and certainly less power is required to operate the auxiliary slide than would be necessary were the 50 general practice to which I have referred, followed.

It will be remembered that the plate or way 20 has been described as adjustably 55 mounted and it will be understood that the movement thereof is transversely of the bed 2. In practice a screw and nut or equivalent means will be provided for adjusting said plate or way 20 although no means (for 60 sake of clearness) is shown for this purpose. By reason of this feature I secure a double adjustment of the tool, a rough or initial adjustment being secured by the movement of the cross slide 19 while a

finished, final or fine adjustment can be obtained by the action of the plate or way 20. 65

What I claim is:

1. The combination of a tool-slide, a lever for operating said slide, means active against the lever to cause a stroke of the slide, and 70 means for changing the length of stroke of the slide without changing the amount of movement of the lever.

2. The combination of a tool-slide, a swinging lever having an elongated slot, a 75 shoe adjustable in said slot, for engaging said slide, a screw tapped into said shoe and adapted to engage said lever to hold the shoe in an adjusted position, and means for operating said lever to cause a stroke of the 80 slide.

3. The combination of a tool-slide, a lever for operating said slide, a rotary cam active against said lever to cause a stroke of said 25 slide, and means for changing the amount of stroke of the slide by said lever without changing the amount of stroke of the lever.

4. The combination of a bed, a head-stock on said bed, provided with a work-spindle, a cross-slide on the bed, a tool-slide mounted 90 on the cross slide for movement longitudinally of the bed, and automatic-mechanism for moving said tool-slide backward and forward independently of the motion of said 95 cross slide.

5. The combination of a slide, a swinging lever provided with a device adjustable thereon toward and from the axis of motion of said lever and adapted to engage said 100 slide, and mechanism for operating said lever to impart a stroke to said slide.

6. The combination of a bracket, a stud shaft supported by said bracket, a telescopic shaft having a universal connection with said stud-shaft, a plate, also having a stud 105 shaft connected by a universal joint with said telescopic shaft, a third shaft transverse to said second stud shaft, having a splined connection with said plate and geared to said second stud shaft, and a cam 110 fixed to said third shaft, said bracket and plate being adapted for attachment to the bed of a lathe.

7. The combination of a bracket, a stud shaft supported by said bracket, a telescopic 115 shaft having a universal connection with said stud shaft, a plate also having a stud shaft connected by a universal connection with said telescopic shaft, a third shaft transverse to said stud shaft, having a 120 splined connection with said plate and geared to said second stud shaft, a cam fixed to said third shaft, and a block provided with a swinging lever operable by said cam, the block being chambered to receive said 125 cam.

8. The combination of a bed, a carriage movable longitudinally of said bed, a plate

constituting a way, slidably supported by
said carriage, for movement transversely of
said bed, a cross-slide supported by said
plate, for movement transversely of the bed,
5 a swivel member on said cross slide, an aux-
iliary slide supported by said swivel mem-
ber for movement approximately longitudi-
nally of said bed, and automatic means for

moving said auxiliary slide back and forth
without operating said cross slide.

In testimony whereof I affix my signature
in presence of two witnesses.

BENGT M. W. HANSON.

Witnesses:

F. E. ANDERSON,
CHAS. E. HOLT.