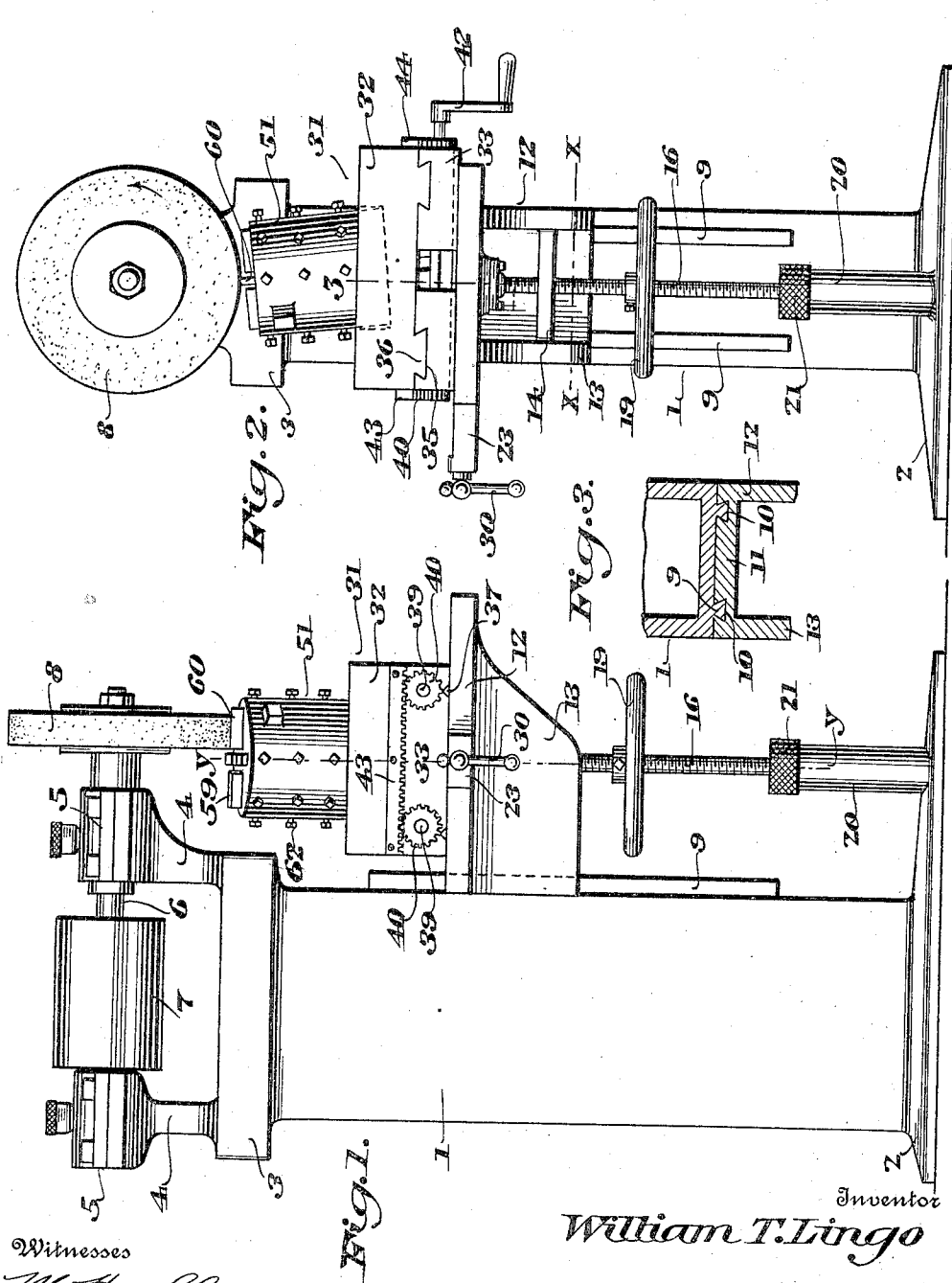


W. T. LINGO.
SURFACE GRINDER.
APPLICATION FILED OCT. 6, 1914.

1,179,850.

Patented Apr. 18, 1916.

2 SHEETS—SHEET 1.



Witnesses
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2 SHEETS—SHEET 2.

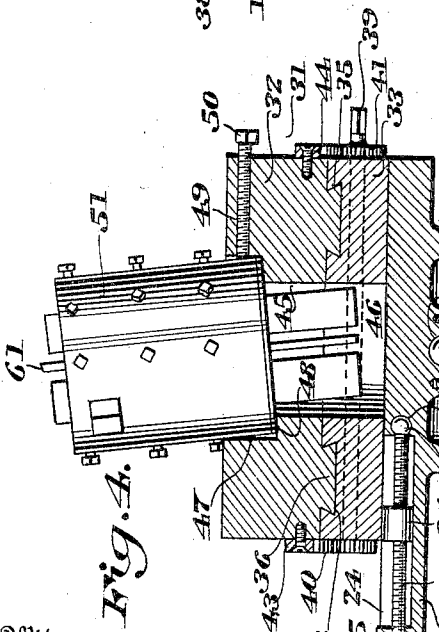
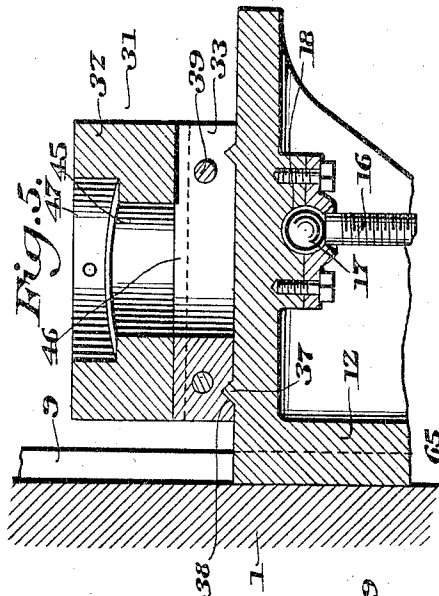


Fig. 7.

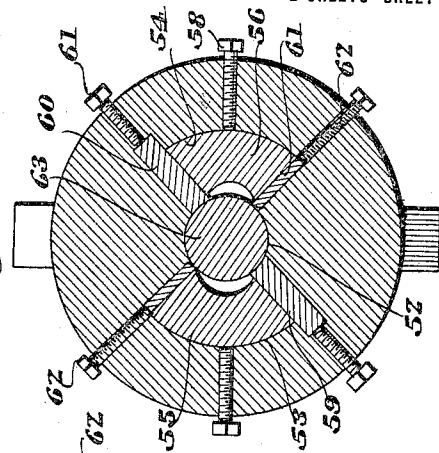
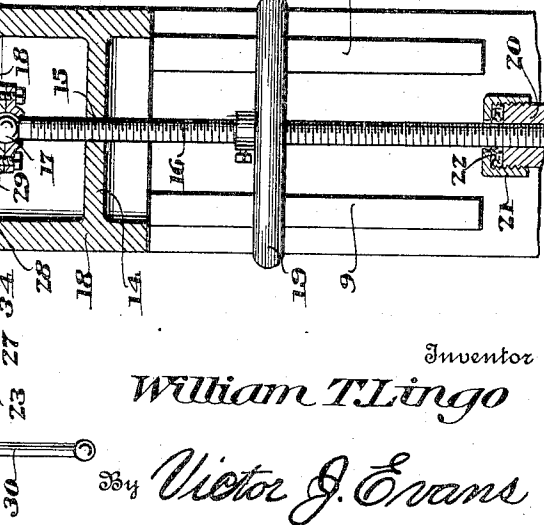
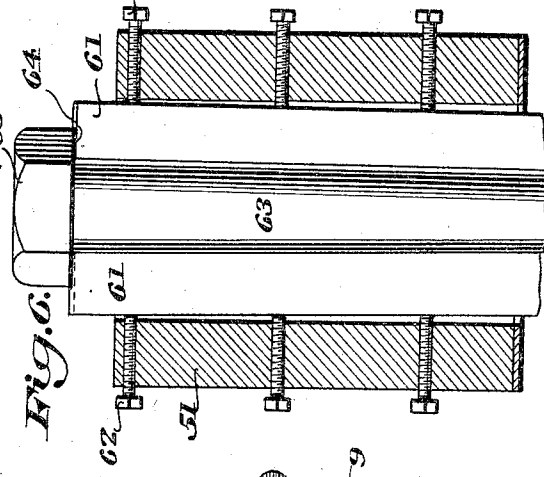


Fig. 6.



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SURFACE-GRINDER.

1,179,850.

Specification of Letters Patent.

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To all whom it may concern:

Be it known that I, WILLIAM T. LINGO, a citizen of the United States, residing at Philadelphia, in the county of Philadelphia and State of Pennsylvania, have invented new and useful Improvements in Surface-Grinders, of which the following is a specification.

The present invention relates to sharpening or grinding machines, primarily adapted for sharpening and finishing cutter heads of bolt cutters without necessitating the removal of the cutters from the holding device or what is commonly termed the "steady rest."

In carrying out my invention it is my purpose to provide a machine with a rotary grinding wheel, to arrange a vertically adjustable table beneath the wheel, and to provide the top of the table with a support commonly known in the art as a "compound," the said support or compound comprising two members, one adjustable upon the other, one of the said members being provided with an annular, angularly disposed pocket to receive the "steady rest" so that the cutting members or knives, which project a suitable distance above the "steady rest," may be brought into proper position to be acted upon by the grinding wheel, and so obviate the necessity of removing the cutters from the "steady rest."

It is also my purpose to produce a machine of this character which shall be of a simple construction, easy to operate, and which may be minutely adjusted to produce the desired bevel upon the head of the cutter.

Other objects and advantages will appear as the nature of the invention is more fully understood, reference being had to the accompanying drawings in which there is illustrated a simple and satisfactory reduction of the improvement to practice, and in which:—

Figure 1 is a side elevation of the improvement showing the "steady rest" arranged within the compound, and the cutter head being operated upon by the grinding wheel. Fig. 2 is a face view of the same. Fig. 3 is a detail transverse section approximately on the line $x-x$ of Fig. 2. Fig. 4 is a detail enlarged sectional view approximately on the line $y-y$ of Fig. 1. Fig. 5 is an enlarged detail sectional view approximately on the line $z-z$ of Fig. 2, the "steady

rest" being removed from the compound. Fig. 6 is a transverse sectional view through the "steady rest" taken in a plane with the knives or cutters. Fig. 7 is a transverse sectional view through the "steady rest."

In the manufacture of bolts, and especially bolts employed in boiler and locomotive construction, it is desirable that the under faces of the heads be ground to present a flat surface, and that the shanks of the bolts be also ground so that the same will be slightly beveled from the heads to the ends of the bolts. The knives or cutter members are arranged in what is known to the trade as a "steady rest," and are adjusted minutely so that the required bevel only will be given to the shanks of the bolts. The cutter members are permitted to project a slight but suitable distance above the "steady rest." The proper adjustment of the cutters within the "steady rest" require quite an amount of time, and therefore, the operation may be considered costly. The projecting portions of the cutters, or what is commonly termed the heads thereof, at times contact with the hardened heads of bolts, and as a result the cutters thereof are caused to break, and besides this the heads of the cutters frequently become dull and require resharpening.

As stated, the proper position of the cutters within the "steady rest" requires quite an amount of time, so it will be noted that the removal of the cutting elements for the sharpening of the heads thereof can be considered a costly operation. This is especially true when the fact is considered that the heads of the cutters must be exactly arranged above the upper face of the cutter rest, and also that each of the said cutters must be provided with the same bevel or inclination, as otherwise one of the cutters would work in advance of the other, and as a consequence destroying the work operated upon.

With my machine I entirely overcome the necessity of removing the cutters from the "steady rest," and also provide means whereby the cutters are sharpened at the same and desired angle.

In practice, I employ a body or standard 1, preferably provided with an elongated substantially rectangular base 2 which is fitted to the floor to prevent wobbling or other movement of the machine. The body or standard 1 is provided, upon its upper

surface, with a preferably rectangular head 3 that has formed therewith oppositely disposed upstanding members 4—4, each of the same having its upper portion or face flanged laterally and centrally formed with a substantially U-shaped channel, thus forming one of the members of suitable bearings 5, and within the said bearing is mounted a shaft 6, the said shaft, between the bearings, being provided with a pulley or operating wheel 7, and the said shaft, projecting a suitable distance beyond one of the bearings, being provided with a grinding wheel 8.

The body 1, upon what I will term the front face of the machine, is provided with spaced vertically projecting tongues 9—9, the said tongues being of a dove-tail shape in cross section and adapted to receive dove-tailed grooves 10—10 provided upon the rear member 11 of a table 12. The table is also preferably formed with spaced side members 13 that integrally connect with the rear face 11, and the said members 13 are, approximately centrally connected by a web 14. The web is provided with a vertically disposed annular opening 15 through which plays a screw 16. The upper end of the screw 16 is provided with a ball head 17, the said head being received in a spherical bearing 18 provided upon the under face of the table 12. The screw has adjustably secured thereon a turning wheel 19, and the lower end of the said screw is arranged within the threaded bore of a hollow post 20, the said post being integrally formed with the portion of the post beyond the face of the body 1, and the said post may have its upper end provided with exterior threads to receive the inner threads of the flange of a cap 21, and a washer 22 may be arranged between the inner face of the cap and the upper face of the post 20. By such an arrangement it will be noted that upon manipulating the wheel 19 the screw 16 will be rotated, the lower threaded end working within the threaded bore of the post 20, while the annular opening 15 in the web 14 sustains the screw against lateral movement so that the table may be nicely adjusted in a vertical direction upon the body 1.

The top 12 of the table is provided with a lateral extension 23, the said extension having its upper face provided with a longitudinally extending groove or depression 24 so that the outer end of the said extension is provided with what may be termed an angular wall 25. The wall 25 is provided with a longitudinally extending threaded opening 26 through which passes the threaded rod 27, the inner end of the said rod having a ball head 28 which is received in a spherical bearing 29 provided upon the portion of the table 12 formed by the inner wall of the channel 24. The outer

end of the rod 27 is also provided with a head having an opening for the reception of a handle 30, the opposite ends of the handle being engaged to prevent the same from slipping through the opening in the outer head of the rod 27.

The numeral 31 designates the support for the cutter blade holder or "steady rest". The support 31 is commonly known in the trade as a "compound", and will be so referred to in this specification. The compound includes an upper member 32 and a lower member 33. The lower member 33 is provided, adjacent one of its ends, with a depending ear 34, the said ear having internal threads, and the rod 27 passes through the bore of the said ear and engages the threads thereof. This arrangement, it will be noted, permits of the lateral movement or adjustment of the section 33 when the threaded rod 27 is rotated. The adjacent or meeting faces of the sections 32 and 33 are flat, one lying snugly against the other, and the upper face of the section 33 is provided, adjacent its ends, with dove-tailed grooves 35, the same being arranged at a right angle to the longitudinally extending rod 27 and, of course, at a right angle to the axial plane of the lug or ear 34. The section 31 is provided upon its under face with dove-tail shaped tongues 36 which are received within the dove-tailed grooves 35 so that the section 32, while free to move in two directions upon the section 33, cannot be removed from the said section in a vertical direction. The table has its upper face provided with substantially V-shaped ribs 37 which are disposed at a right angle to the tongues 36 and the groove 35, and the said ribs are received within substantially inverted V-shaped channels 38 formed upon the under face of the compound section 33.

Passing through suitable annular openings in the section 33 are spaced rods or shafts 39—39, the said shafts being arranged in the same direction as the ribs 37 and the channels 38 and disposed thereabove. Each of the rods is provided adjacent its opposite ends with toothed wheels 40 and 41, respectively, each of the rods 39 extending beyond the toothed wheel 41 and being square or angular in cross section to receive the angular bore of a removable angular handle member 42. Arranged upon opposite sides of the section 32 are rack bars 43 and 44, respectively, the teeth of the wheels 40 engaging the teeth of the rack bar 43, while likewise the teeth of the wheel 41 engage the teeth of the rack bar 44, so it will be noted that by operating one or both of the handles 42 the section 32 will be caused to move over the section 33 of the compound in the direction of the longitudinal plane of the table 12, while, as above stated, the operation of the rod 27 will cause both of the sections of the

compound to move transverse of the table 12, and the purpose of this arrangement will presently be described.

Both of the sections 32 and 33 are centrally provided with annular openings 45 and 46, respectively, which are of a similar size and which register when the plates comprising the sections 32 and 33 are arranged in a normal position, that is, when the ends or faces of the said sections are disposed flush with each other. The section 32 above its opening 45 is provided with a depression forming a pocket 47, the said pocket of course communicating with the opening 45, and the lower wall 48 of the pocket 47 is arranged at an angle with respect to the flat opposite face of the section 32. The section 32 is provided with a longitudinally extending threaded opening 49 adapted to receive a threaded binding element 50, the shank of the said member 50 entering the pocket 47, and this end of the said member is adapted to bear against one of the faces of a knife or cutter holder 51. The member 51 is commonly termed in the art a "steady rest", and ordinarily comprises a tubular member having a central annular bore 52, and longitudinally extending arcuate depressions 53 and 54 which are arranged diametrically opposite each other and which communicate with the bore 52. Arranged within the arcuate depressions 53 and 54 are segmental members 55 and 56, adjusting screws 58 bearing centrally against the outer faces of the segmental members 55 and 56 to force the same against the bore 52.

The numerals 59 and 60 designate what may be termed the wedge or filler members, each of which resting between one of the walls of each of the arcuate depressions and one of the sides of each of the segmental members 55 and 56, and the said members 59 and 60 are adapted to force the opposite sides of the members 55 and 56 toward the opposite walls provided by the arcuate depressions, and so cause the said members to tightly engage one of the faces or sides of knife or cutting members 61 to compress the said members against the unengaged side of the arcuate depressions. Regulating screws 61' are provided for adjusting the members 59 and 60, and likewise similar screws 62—62 bear against the outer edges of the cutter members 61 to force the same to within the bore 52 of the "steady rest" 51 to adjust the same with relation to the bolt 63 upon which they are to operate. The cutter members 61—61 are extended a suitable distance beyond what may be termed the upper end of the "steady rest" 51, the edges of the projecting portions providing what is termed heads and which is designated by the numeral 63, and these heads operate upon the under face of a head 64 of the bolt 65.

When the "steady rest" 51 is arranged

within the pocket 47 and secured thereto by the binding element 50, and so retained against rotation in the pocket, the sections 32 and 33 of the compound are adjusted to bring the head 64 of one of the cutter elements directly beneath the grinding wheel 8, and if a vertical adjustment is required the table 12 is moved. It is to be understood that the cutter members are arranged one diametrically opposite the other, and when one of the cutter elements has been operated upon or is in the position illustrated in Fig. 1 of the drawings the head of the second cutter element may be brought into proper position to be ground by the wheel 8 by manipulating the handles 42, causing the section 32 to move away from the section 33 in an outward direction with respect to the table 12 and the body 1, and it will thus be noted that when the "steady rest" 51 is once positioned within the pocket 47 of the compound it is not necessary to rotate the same to bring the second knife under the grinding wheel 8. It will be further noted that by arranging the pocket 47 at an angle the proper pitch for the cutting edge of the heads of the cutter members is readily determined, and from the above description, taken in connection with the drawings, the simplicity and advantages of the device will, it is thought, be perfectly understood without further detail description.

Having thus described the invention, what is claimed is:—

1. In a machine for the purpose set forth, a body provided with a rotatable grinding wheel, means for operating the wheel, a vertically adjustable table carried by the body and arranged below the wheel, a compound comprising two interchanging members arranged upon the table and adjustable with respect to the table, the sections of the compound being centrally provided with openings, and the upper section having a pocket, the walls of which being angularly arranged with respect to the sections of the compound, a laterally disposed adjustable binding element carried by the upper section and communicating with the pocket.

2. In a machine for the purpose described, a body, a grinding wheel upon the body, means for operating the grinding wheel, a vertically adjustable table arranged upon the body, said table having a lateral extension, the upper face of which having a longitudinal groove, a compound comprising two flat sections arranged one upon the other and upon the table, the lower section being mounted in transverse guides upon the table, said lower section having a depending rib arranged within the groove of the table extension, an adjusting screw carried by the extension and co-acting with the lug for sliding the lower section transverse of the table, said lower section having trans-

versely arranged shafts, a toothed wheel upon the opposite ends of the shafts, a removable handle for the shafts, said lower section having grooves arranged transverse of the shafts, the upper section having its lower face provided with dove-tailed tongues which engage within the grooves, rack bars upon the upper section and engaged by the toothed wheels, both of said sections being centrally provided with a circular opening, and the upper section having a pocket surrounding its opening and having its walls and base arranged at an angle to the walls of the opening, and a longitudinally adjustable binding element upon the said upper section and communicating with the pocket. 15

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

WILLIAM T. LINGO.

Witnesses:

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NORMAN J. SMITH.

Copies of this patent may be obtained for five cents each, by addressing the "Commissioner of Patents, Washington, D. C."