W. F. TRIPP.

VALVE GRINDING MACHINE.

APPLICATION FILED OCT. 4, 1916.

1,256,185.

Patented Feb. 12, 1918.

2 SHEETS—SHEET 1.

Fig. 1.

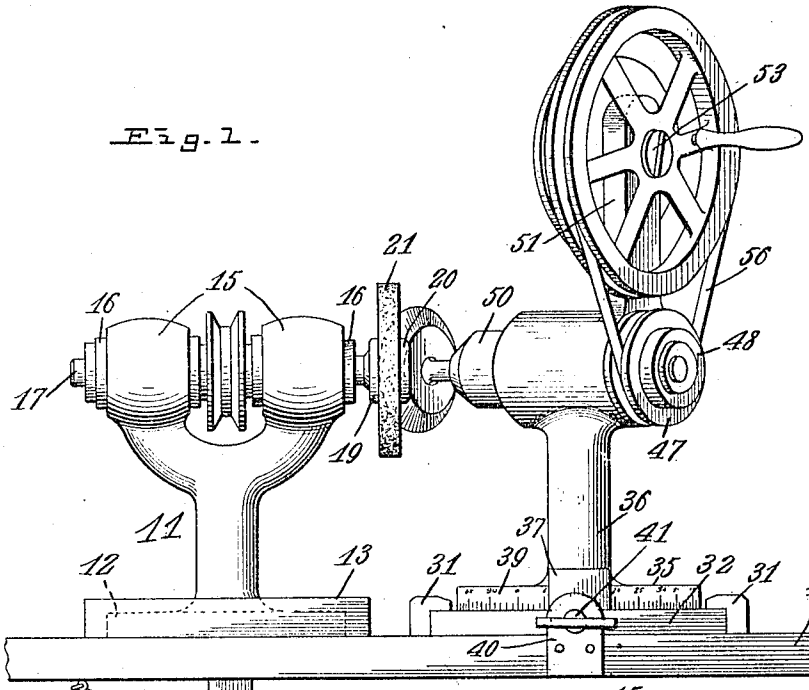


Fig. 3.

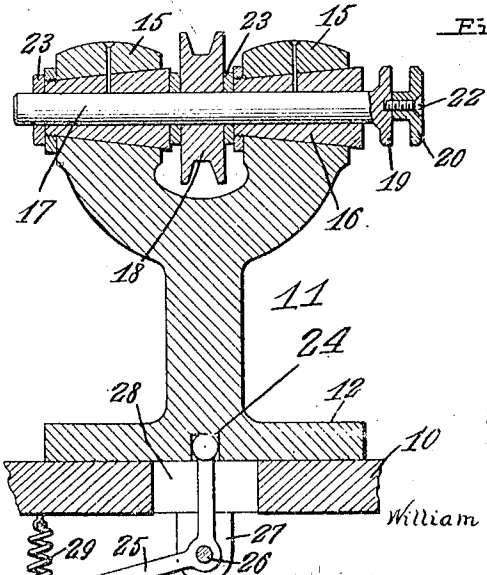
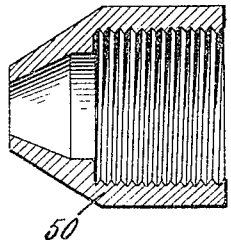


Fig. 5.



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WITNESSES

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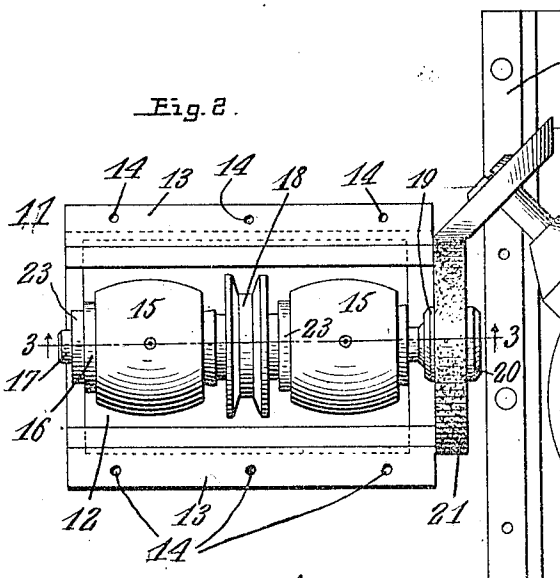
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2 SHEETS—SHEET 2.

Fig. 2.



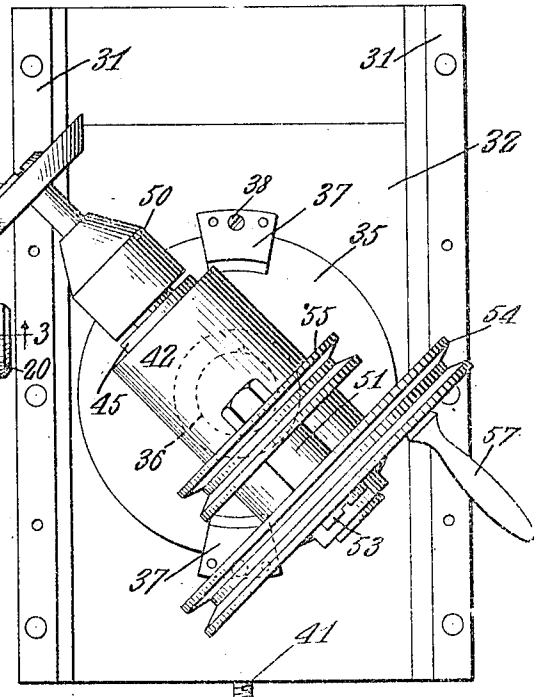
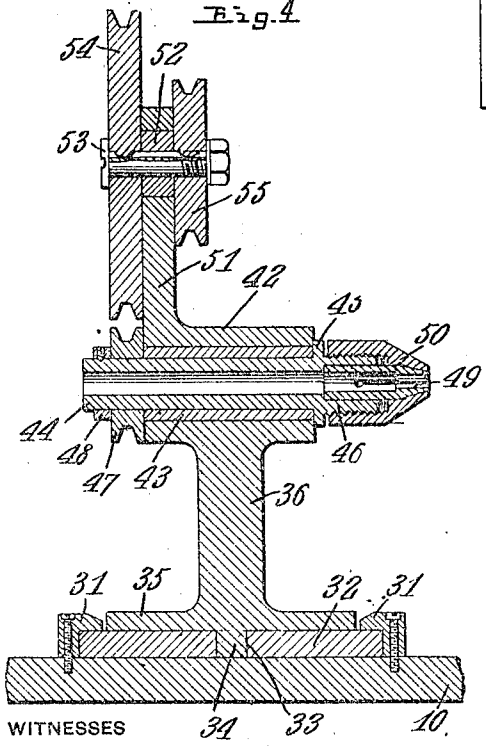


Fig. 6.

Fig. 4.



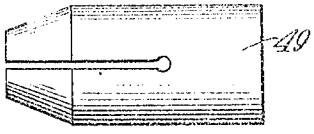
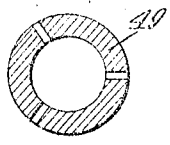


Fig. 7.



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UNITED STATES PATENT OFFICE.

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VALVE-GRINDING MACHINE.

1,256,185 Specification of Letters Patent. **Patented Feb. 12, 1918.**

Application filed October 4, 1916. Serial No. 123,768.

To all whom it may concern:

Be it known that I, WILLIAM F. TRIPP, a citizen of the United States, residing at Greenfield, in the county of Franklin and State of Massachusetts, have invented certain new and useful Improvements in Valve-Grinding Machines, of which the following is a specification.

This invention relates generally to grinding machines, and particularly to machines for grinding valves.

Primarily, the invention aims to provide a grinding mechanism which shall be of simple and improved construction, and by the use of which valves may be quickly, easily, and accurately ground or resurfaced. The invention has for a further object to provide a device of this character which embodies improved adjusting means, so as to enable the device to operate upon valves of various sizes, shapes, and constructions, and to properly bevel the valve heads during the grinding operation. A still further object is to provide in a grinding device including a pair of relatively movable stocks, improved means for adjusting the stocks so that their frictional contacting elements will be properly disposed, as well as improved means for moving one of the stocks to engage or disengage its rotating member with the corresponding member of the adjacent stock. Still further objects reside in the arrangement of a device of the character described, which may be constructed of comparatively few, simple and readily assembled parts, all so constructed and arranged as to prevent wear, breakage or derangement of the same; which is equipped with means for operating the same either manually or by a motor or engine; which includes improved means for readily accommodating valves of various sizes, shapes and configurations; and which will prove thoroughly practical and efficient in use.

With these objects in view, together with others which will appear as the description proceeds, the invention consists in the arrangement of a pair of relatively movable stocks, one equipped with a rotating grinding element and the other having a spindle for the attachment of a valve to be ground, means upon the second stock for rotating the spindle, means for adjusting the second stock so as to dispose the valve held upon the spindle thereof with its seat engaging surface properly disposed against the grinding element, means for moving the grinding element into and out of engagement with the valve carried by the second stock, and means for yieldably holding said grinding element engaged with the valve.

The invention consists further in the novel formation, combination and arrangement of parts, all as will be described more fully hereinafter, illustrated in the drawings, and particularly pointed out in the claims.

In the drawings:—

Figure 1 is an elevational view of a grinding mechanism constructed in accordance with the invention, and illustrating the same ready for use;

Fig. 2 is a plan view of the device shown in Fig. 1;

Fig. 3 is a sectional view taken substantially upon line 3—3 of Fig. 2, and with the grinding member removed;

Fig. 4 is a sectional view taken through the head stock, and showing the device with the valve removed;

Fig. 5 is a sectional view taken through the screw cap for holding the valve attached to the head stock;

Fig. 6 is a side elevation of the chuck used for retaining the valve stem to the head stock; and

Fig. 7 is a transverse sectional view taken through the device illustrated in Fig. 6.

Referring now more particularly to the drawings, 10 indicates a suitable table or base upon which the grinding mechanism is supported.

Arranged upon the table 10 is a wheel stand indicated generally at 11, the latter comprising a suitable standard, having a relatively wide base 12 rectangular in shape, and which is held upon the said table between two spaced parallel guide rails 13. These rails are secured to the table 10 by means of bolts or screws 14, and provide inturned flanges for engaging over the upper surface of the base 12 adjacent the longitudinal edges of the latter. The standard comprising the wheel stand is forked at its upper end as shown, and provides a pair of spaced alined barrels 15, each equipped with a suitable bushing 16 supporting a rotatable spindle or shaft 17. This shaft has secured thereto, intermediate its ends, a belt pulley 18, through the medium of which rotary movement is imparted to the spindle from a suitable source of motive power. One end of the shaft or spindle 17 is provided with a

flange 19, and a removable head 20 is associated with said end to secure a grinding wheel 21 thereto. The head 20 may be detachably secured to the flanged end of the shaft or spindle by means of a screw 22. The shaft 17 may be held against longitudinal movement within the bushings 16 in any suitable manner, collars 23 being employed in the present instance.

The under face of the base 12 is notched or cut away at its central portion as at 24 to receive one end of a bell crank lever 25 pivoted as at 26 within suitable bearings or brackets 27 secured to the under face of the table 10. This bell crank has its base engaging arm extended through an elongated slot 28 formed in the table immediately beneath the said base, and the lever is so arranged that movement of the said lever will slide the wheel stand within the guide rails 13 according to the direction of movement of the lever. A contractile spring 29 connects the outer end of the bell crank lever with the table 10, and tends normally to move the said outer arm of the lever upwardly, whereby the wheel stand is held yieldably near the limit of its movement in one direction in the guide rails 13. A link or rod 30 is connected to the outer end of the bell crank lever, and may be associated with a treadle or other operating lever for controlling the movements of the wheel stand. It is preferred that this rod 30 be connected with a pedal so that the wheel stand may be moved by operation of the foot.

Arranged upon the table 10 in spaced parallel relation beyond the flanged end of the spindle 19 and disposed at right angles to the guide rails 13 is a pair of guide rails or trackways 31, secured to the table in substantially the same manner as the rails 13 for guiding the wheel stand. Disposed within the guides 31 so as to move longitudinally therein is a platform or base 32, which is provided with a central aperture 33 for the reception of a stud or stem 34 depending from the central portion of a base 35 carrying a standard 36. This arrangement permits of rotary movement of the base 35 upon the platform 32, and guide clips 37 may be secured as by screws 38 upon the platform 32 and engage over the annular edges of the base 35 at diametrically opposite points. Tightening of the screws 38 binds the clips 37 downwardly upon the base edges and the said base will be prevented from rotating, while loosening of the screws will release the said base and the same may be moved about a vertical axis. The annular edge of the base may be graduated as indicated at 39, so that the degree of rotary adjustment of the standard and its base may be readily and accurately regulated.

Projecting upwardly from the table 10 beyond the ends of the guide rails 31 and preferably midway between the latter is a post 40, in which is rotatably mounted an adjusting screw 41, the threads of the latter extending into an internally threaded bore in the forward edge of the platform 32. This construction obviously enables the platform to be moved within the guide rails 31, and the said platform is at all times held against accidental movement between its trackways.

The standard 36 is formed at its upper end with an elongated horizontally disposed barrel 42, which carries a bushing 43, within which is rotatably mounted a hollow spindle 44. This spindle is flanged at one end as at 45, and is also equipped with an outwardly extending slightly enlarged exteriorly threaded nipple 46. To the opposite end of the spindle is detachably secured a grooved pulley 47, a collar 48 being employed to hold the said pulley upon the spindle and to prevent the spindle moving inwardly of the said barrel. The barrels 15 and 42 of the wheel stand and standard respectively, are arranged so that the spindles carried thereby lie in the same horizontal plane, and are capable of being axially alined.

The hollow spindle 44 is adapted to receive the stem of a valve to be ground, and a split chuck 49 is adapted for insertion within the end of the exteriorly threaded nipple 46. A screw cap 50 is adapted to be screwed over the threads upon the nipple 46, and the said screw cap is provided with a tapered or conical inner surface at one end to engage the outer extremity of the split chuck to force the latter rearwardly within the nipple 46, and to bind the said chuck securely upon the stem of a valve extending through the same.

Extending upwardly from the barrel 42 at the groove wheel end thereof, is a post 51, the latter being apertured at its upper end to receive a bushing 52, and through the latter extends a shaft 53 carrying at its protruding ends large and small groove pulleys 54 and 55 respectively. The large pulley 54 is in vertical alinement with the groove pulley 47 on the spindle 44, and a belt 56 may be passed over the said pulleys to transmit rotary movement from the shaft 53 to the spindle 44. The pulleys 54—55 may be keyed upon the shaft 53, and a handle 57 is detachably secured to the large pulley, whereby the latter may be manually rotated. When is desired to operate the spindle 44 by motive power, such as by motor or engine, the pulley 55 is belted with the engine or motor, and the handle 57 removed from the pulley 54. A relatively low rotation of the engine pulley will, by reason of the pulley arrangement 55—54, develop a high degree of rotation in the spindle 44.

To prevent confusion in the description

and operation, I shall refer to the wheel stand 11 as the tail stock, and to the valve carrying mechanism as the head stock. When it is desired to grind a valve, the stem of the same is inserted in the hollow spindle 44 of the head stock, and the screw cap 50 tightened upon the nipple 46. This operation firmly holds the valve stem upon the spindle. The head stock is then adjusted upon the platform so that the beveled face of the valve head lies flush with the surface of the grinding wheel 21. Owing to the various degrees of inclination of the valve heads, it will be necessary to minutely adjust the head stop so as to dispose the valve head at the proper inclination. In this respect the graduations 39 upon the annular edge of the base 35 may be used to properly dispose the valve. The adjusting screw 41 is then operated to draw the platform 32 inwardly until the valve engages the peripheral edge of the grinding wheel 21. After proper adjustments have thus been made, the spindles upon the head and tail stocks are set into operation, and proper grinding of the valve will take place. Operation of the treadle or lever to which the bell crank 25 is connected will move the tail stock so as to disengage the grinding wheel carried thereby from the valve held by the head stock.

From the foregoing, it is apparent that valves of various types, sizes and shapes may be secured in the head stock and adjusted in such manner as to present its seating surface properly to the grinding element. It will be understood that valve holding spindles of various sizes and shapes may be employed in the barrel 42 of the head stock so as to adapt the device to all types of valve stems. The mechanism may be operated either by hand or from a motor, engine or counter-shaft, it being understood that operation of the pulley 54 through the handle 57 creates rotation in the spindle 44.

While the present illustration is that of the preferred embodiment of the invention, it is obvious that various changes in the minor details of construction and arrangement of parts may be resorted to, if desired, without departing from the spirit of the invention, or exceeding the scope of the claims, and the right to make such variation in construction is hereby reserved.

What is claimed is:—

1. In a grinding machine, the combination with a grinding element, of a platform mounted to slide laterally of said grinding element and adjacent one end thereof, a post, a stem rotatably mounted in said post and threaded into said platform for moving the latter, a stock carried by said platform and capable of moving upon a vertical axis, a spindle on said stock for supporting work to be engaged by said grinding element, and means for rotating said spindle.

2. In a grinding machine, the combination with a grinding element, a platform arranged adjacent said grinding element and capable of moving laterally thereof, means for moving said platform, a standard, a base for said standard resting upon said platform, clips adjustably secured upon said platform and engaging over the edges of said base, a spindle carried by said standard, means for securing work to a spindle to be engaged by said grinding element, and means for rotating said spindle.

3. In a grinding machine, a table, a tail stock having a base, guide rails secured to said table and engaging over the edges of said base to permit of the latter moving therein, a grinding element upon said stock, the said base being provided with a notch, a bell crank pivoted upon said table and engaging at one end in said notch, means for operating said bell crank, a spring connecting said bell crank and said table for normally holding said tail stock moved in one direction, and means for holding work in engagement with said grinding element.

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

WILLIAM F. TRIPP.

Witnesses:

GEORGE A. RICHARDSON,

WALTER M. ATCHERSON.