

F. HAYDEN.
GRINDING AND POLISHING MACHINE.
APPLICATION FILED JULY 8, 1910.

976,875.

Patented Nov. 29, 1910.

2 SHEETS—SHEET 1.

Fig. 1.

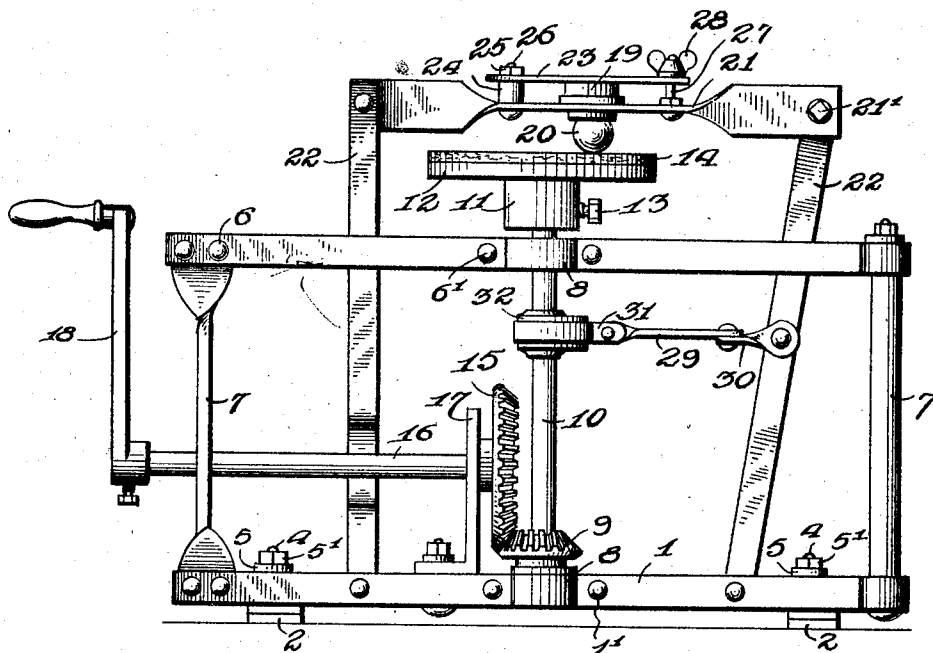


Fig. 2.

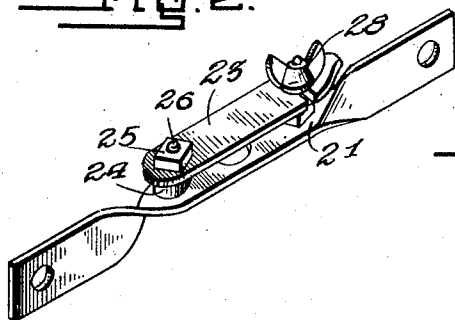
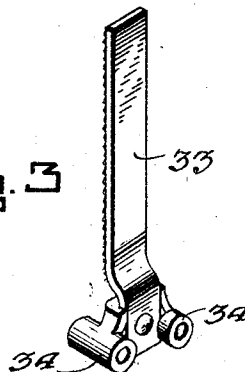


Fig. 3.



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2 SHEETS—SHEET 2.

Fig. 4.

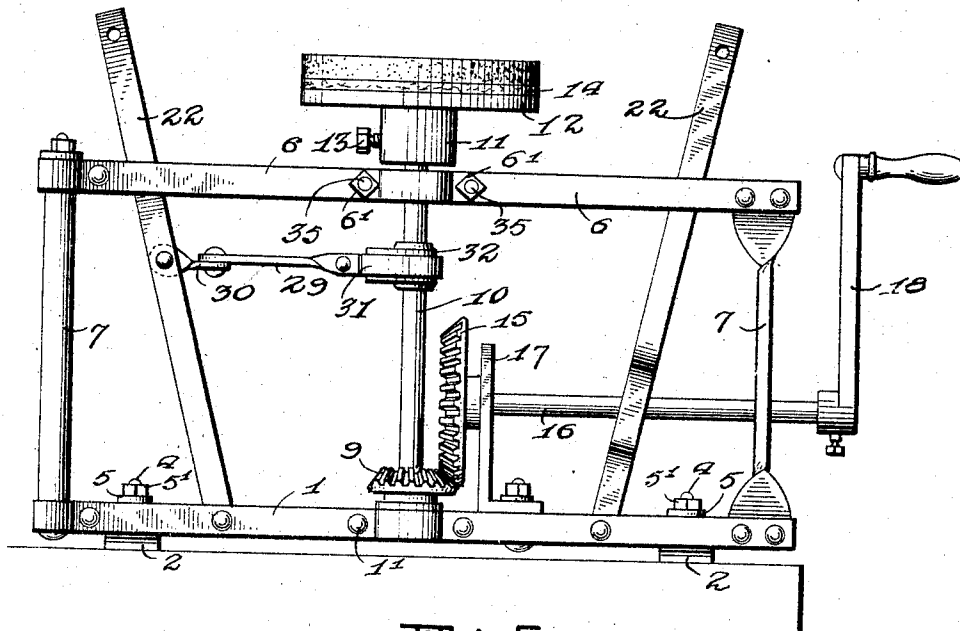
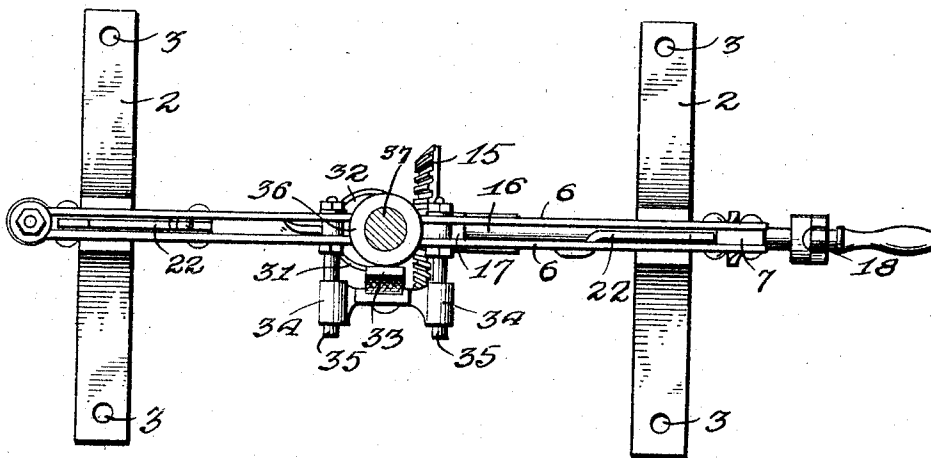


Fig. 5.



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UNITED STATES PATENT OFFICE.

FRANK HAYDEN, OF OTSEGO, OHIO.

GRINDING AND POLISHING MACHINE.

976,875.

Specification of Letters Patent. Patented Nov. 29, 1910.

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To all whom it may concern:

Be it known that I, FRANK HAYDEN, a citizen of the United States, residing at Otsego, in the county of Muskingum and State of Ohio, have invented certain new and useful Improvements in Grinding and Polishing Machines, of which the following is a specification, reference being had therein to the accompanying drawing.

10 This invention relates to metal grinding machines and has a special reference to a machine for grinding the seats and balls used in the valves of oil wells or deep water wells.

15 The invention also has for its object to provide a grinding machine which in addition to being used for grinding the seats and balls of valves used in oil and water wells is also adapted to be used for rasping the rings on the standing valves in such wells.

20 The invention has for its object to provide an improved grinding machine of this character, by means of which balls and seats of the valves for oil wells may be effectively ground and the rings of the valves of an oil well thoroughly rasped.

25 The invention consists in a grinding machine of this character and in details of construction thereof as hereinafter set forth and claimed.

30 In the drawing, Figure 1 is a side view in elevation of a grinding machine constructed in accordance with this invention. Fig. 2 is an enlarged detail view in perspective of the clamping member of the machine. Fig. 3 is a detail view in perspective of a rasp, used with said machine. Fig. 4 is a side view in elevation of the machine with certain parts thereof removed. Fig. 5 is a plan view of the machine showing a rasp and standing valve mounted thereon.

35 A grinding machine constructed in accordance with this invention comprises a frame formed with a suitable base portion and as here shown consisting of two longitudinal strips 1 set up on edge and spaced apart from each other and connected together by suitable bolts or rivets 1, the base portion 1 is supported by transverse flat strips 2 each of which have a hole 3 at its ends for the reception of bolts to secure said plates 2 to a floor, said plates or strips 2 being secured to the base 1 by means of a vertical bolt 4 connected with said strip 40 midway between its ends and clamped to

the strips 1 by means of a washer 5, and nut 5' on the bolt 4. Parallel with and spaced at some distance above the base 1 are two transverse metallic strips 6, similar to the strip 1 and secured together by bolts 6', and spaced apart from each other. The pairs of strips 1 and 6 are connected together by uprights 7, of any suitable shape. Each of the pairs of strips 1 are formed midway between their ends with enlarged curved portions 8, the portions 8 in the strips 1 forming a seat for a horizontal beveled gear wheel 9 mounted on the lower end of the vertical shaft 10, which has its bearing adjacent to its upper end in the enlarged circular portion 8 of the strips 6 and projects beyond the same, and terminates in an enlarged circular head 11 in which is seated the stem of a circular head 12 clamped to the head 11 by means of a set screw 13. The circular head 12 is preferably formed of metal, and secured thereto is a disk 14 formed of canvas belting, canvas felt or cork. Upon the disk 14 is mounted an emery grinding disk 14' as shown in Fig. 4. Meshing with the horizontal gear wheel 9 is a vertical beveled gear wheel 15 mounted on the end of a horizontal shaft 16 having its bearings in an upright 17 of the frame and in one of the uprights 7 thereof, and having at its outer end a crank shaft 18.

19 indicates a valve seat of an oil well and 20 a ball used with said valve seat, said ball being positioned on the disk 14 which is covered with metal powder. The seat 19 rests in a socket in the transverse plate 21 which is pivotally connected at its ends with the upper ends of a pair of reciprocating shaker bars 22 pivoted at their lower ends to the strips 1 forming the base. The seat is held in place and presses against the ball 20 to hold it in position on the disk 14 by means of a plate 23, hinged at one end to a short post 24 and projecting up from the strip 21 and retained in place by a nut 25 on the end of an attenuated portion of the post 24. The other end of the strip 23 has a hole through which projects a pin 27 projecting up from the strip 21 on which pin 27 is mounted a wing nut 28 by means of which the plate 23 may be clamped down against the seat 19. In order to reciprocate the shaker bars 22, one of said bars is connected by a link 29 pivoted at one end to a projection 30 on said shaker bar and at its other end to the ends of a strap 31 encircling an eccentric 32

mounted on the shaft 10. It will be seen that by means of this connection upon operating the crank arm 18 the shaft 10 will be rotated thereby rotating the disk 14, and at the same time reciprocating the bars 22, thereby moving the ball 20 with a rolling movement over the surface of the disk 14. By this means the ball will be prevented from being ground flat or oblong. When it is desired to grind the valve seat the strip 21 which is detachably connected at one end to one of the shaker bars 22, by means of a detachable bolt 21' is released from the bar 22 and swung out of the way of the other bar 22 or entirely removed therefrom if desired. The seat 19 is then placed on the emery wheel 14' and held by any suitable supporting device and ground by the emery wheel 14'. The emery wheel 14' is detachably secured to the disk 12 in any suitable manner and is only used as shown in Fig. 4 for grinding the valve seat 19.

In Fig. 3 is shown a rasp which is used to file the leather rings employed in connection with the standing valves of an oil well.

In Fig. 5 is shown a plan view, in horizontal section, of the upper end of the valve with the usual arrangement of leather rings thereon. The rasp 33 is provided with a couple of horizontal sleeves 34 at its lower end, which are mounted on projections 35 secured to the strip 6.

The rasp as shown in Fig. 5 is held up against the leather rings of the standing valve. The standing valve which is suitably clamped at its lower end to the upper end of the shaft 10 rotates by the rotation of the shaft 10, and thereby causes the leather rings to be revolved against the rasp 33. Of course, it is understood that when the standing valve is to be placed on the shaft 10 the grinding wheel and its head may be removed from the top of the shaft 10.

It will readily be seen that by means of this machine valve seats and balls may be effectively ground and the leather rings of the standing valve thoroughly rasped.

Having described the invention, I claim:

1. In a machine of the character described, a frame, a horizontal grinding wheel mounted in said frame, mechanism for rotating said grinding wheel, a reciprocating frame for holding a valve seat, and ball therein, said ball resting on the grinding wheel, and means for reciprocating said frame.

2. In a machine of the character described, a frame, a horizontal grinding wheel mounted in said frame, mechanism for operating said grinding wheel, vibratable arms operated by said mechanism, and a clamping frame for supporting a valve seat and holding the valve and ball against said grinding wheel.

3. In a machine of the character described, a frame, a vertical rotary shaft in said frame, a horizontal grinding wheel on the upper end of said shaft, a mechanism for rotating said shaft a pair of vibratable arms pivotally connected to said frame, means connecting said arms with said rotary shaft for operating the same, a transverse clamping frame pivotally connected with the upper ends of said vibrating arms, and means carried by said transverse frame for holding a valve seat and its ball against said grinding wheel.

4. In a machine of the character described, a frame, a vertical rotary shaft in said frame, a horizontal detachable disk-shaped head in the upper end of said shaft, a mechanism for rotating said shaft a pair of vibratable arms pivotally connected to said frame, means connecting said arms to said rotary shaft for operating the same, and a clamping frame pivotally connected with and detachable from the upper ends of said vibratable arms.

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

FRANK HAYDEN.

Witnesses:

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