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Patented Dec. 6, 1898.

C. A. & O. W. HULT.  
APPARATUS FOR GRINDING ROUND OBJECTS.

(Application filed Nov. 19, 1897.)

(No Model.)

Fig. 1.

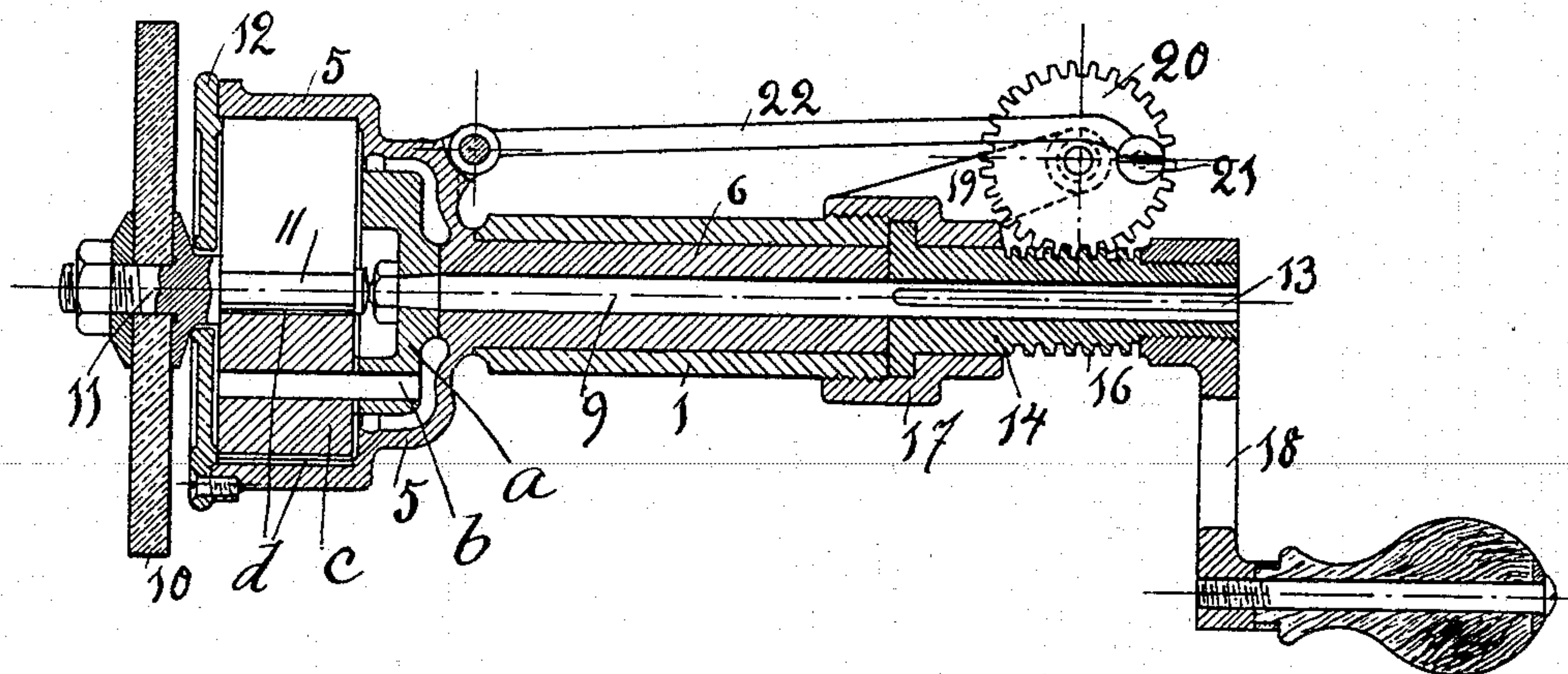


Fig. 2.

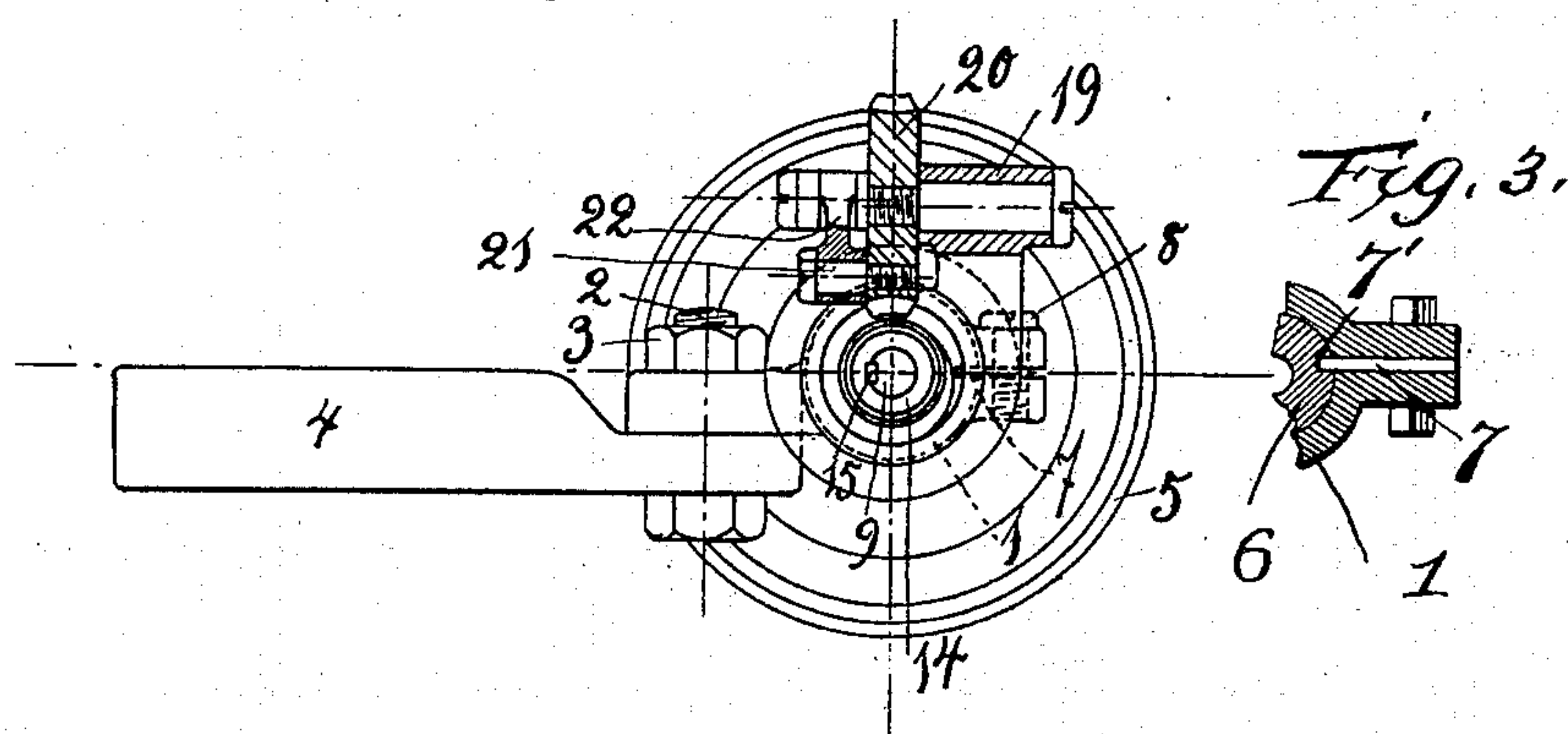
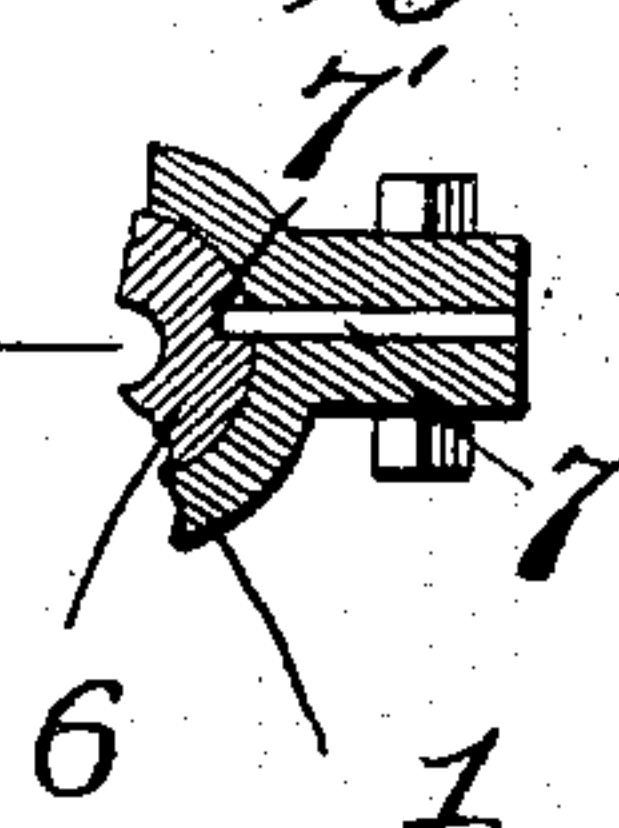


Fig. 3.



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# UNITED STATES PATENT OFFICE.

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## APPARATUS FOR GRINDING ROUND OBJECTS.

SPECIFICATION forming part of Letters Patent No. 615,390, dated December 6, 1898.

Application filed November 19, 1897. Serial No. 659,070. (No model.)

*To all whom it may concern:*

Be it known that we, CARL ALRIK HULT and OSCAR WALFRID HULT, engineers, subjects of the King of Sweden and Norway, and residents of Stockholm, in the Kingdom of Sweden, have invented certain new and useful Improvements in Apparatus for Grinding Round Objects, of which the following is a specification, reference being had therein to the accompanying drawings.

Our invention consists in the devices and constructions hereinafter fully described and claimed.

Figure 1 is a longitudinal section of a grinding-machine arranged according to this invention. Fig. 2 shows an end view of the machine, some parts being shown in section. Fig. 3 is a detail sectional view.

In a sleeve 1, which is cut up in its longitudinal direction and adjustably connected by means of a bolt 2 and a nut 3 to a stem 4 for mounting the machine on another machine, a part of which is to be ground—for instance, a lathe—is a hollow stem 6, extending from a suitable casing or box 5. The stem 6, which can slide in the sleeve 1, is prevented from turning by a key 7 entering into a groove 7', Fig. 3, in the stem and clamped between the edges of the sleeve 1. This sleeve 1 is tightened around the stem 6 by means of screws 8. In the hollow stem 6 is journaled a shaft 9, the end of which extends into the casing or box 5. The grinding-disk 10 is in a suitable manner mounted on a shaft 11, extending into the casing 5 through a cover 12, fixed to said casing by means of screws or the like and forming the one wall of the same. The other end of the shaft 9 extends somewhat past the stem 6 and is provided with a groove 13. On this end of the shaft 9 there is a sleeve 14, provided with external screw-threads 16 and with a key 15, corresponding to the groove 13. As shown, this sleeve 14, which is provided with a crank 18, is journaled in a ring 17 or the like, into which the sleeve 1 is screwed. By rotating the sleeve 14 the shaft 9 is consequently rotated. On account of the key 7 and the corresponding groove in the hollow stem 6 and of the key 15 and the groove 13 the stem 6 and the shaft 9 can slide in the sleeves 1 and

14, respectively, while the shaft 9 is rotated by the aid of the crank 18. Consequently the casing or box 5, the gear contained therein, and the disk 10 can move to and fro during the rotation of said disk. For obtaining this reciprocating movement of the casing or box 5 a worm-wheel 20, engaging into the threads 16 on the sleeve 14, is journaled on an arm 19, extending from the ring 17. This worm-wheel has a crank-pin 21 connected to a pin or the like on the casing 5 by a rod or link 22. When the crank 18 is rotated, the worm-wheel 20 is brought to rotate, the rod or link 22 thereby carrying the casing or box 5 and thus the disk 10 to and fro. Thus the rotation as well as the reciprocating motion of the disk 10 is imparted to the same by means of the crank 18. The sleeve 1 and the stem 6 are of such a length that the latter does not lose its guidance in the former at the reciprocating motion of the casing.

Other suitable gears between the shaft 9 and the worm-wheel 20 may be employed instead of that shown on the drawings.

If the machine is to be driven by machine-power, the crank is substituted by a pulley.

A disk *a* is fixed on the shaft 9, bearing a number of pins *b*, upon each of which is journaled a roller *c*. A yielding ring *d* is freely mounted upon each of the rollers, which ring bears partly upon the inside of the casing 5 and partly upon the shaft 11. When the shaft 9 and disk *a* are rotated, the rings *d* obtain a rotating motion around the respective pins *b* through their friction against the casing 5, which motion is transmitted to the shaft 11, which evidently thereby rotates more rapidly than the shaft 9.

Having now described our invention, what we claim as new, and desire to secure by Letters Patent, is—

1. In combination, the shaft 9, the grinding-wheel, means of connection between the grinding-wheel and shaft 9, the worm-sleeve 14 with means for turning the same and through which the shaft 9 may slide, the worm-wheel engaging the worm-sleeve and means of connection between the worm-wheel and the shaft 9.

2. In combination, the sliding shaft 9 with means of connection with the grinding-wheel,

the sleeve 1, the worm-sleeve 14, through which the shaft 9 may slide, the non-rotary sleeve 6 about the shaft 9 and adapted to move in the sleeve 1 with said shaft, and the worm 5 and pitman connection, said pitman being in connection with the sleeve 6, substantially as described.

In witness whereof we have hereunto signed

our names in the presence of two subscribing witnesses.

CARL ALRIK HULT.  
OSCAR WALFRID HULT.

Witnesses:

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