R. H. GRANT.

GRINDING MACHINE.

APPLICATION FILED SEPT. 21, 1912.

1,106,803.

Patented Aug. 11, 1914.

2 SHEETS—SHEET 1.

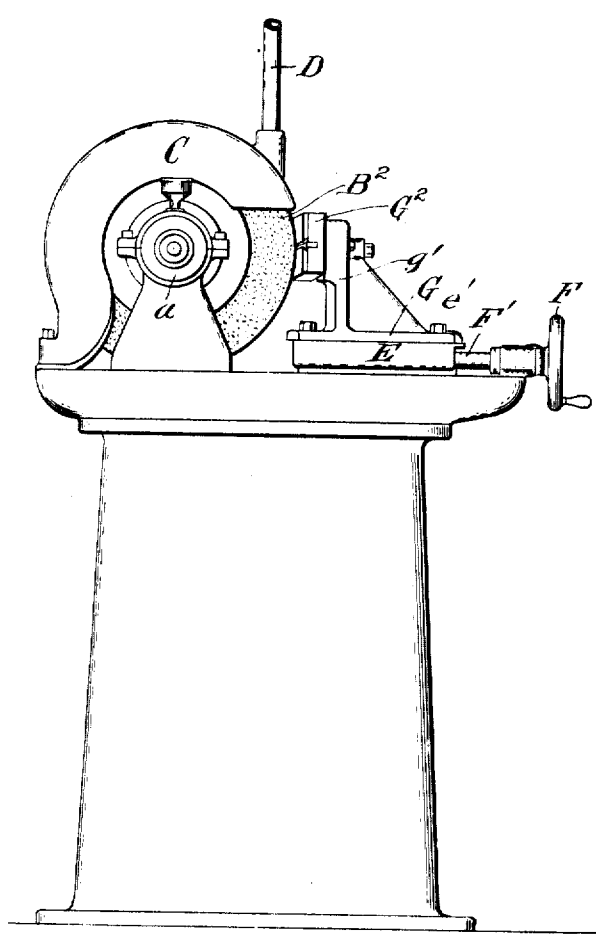


Fig. 1.

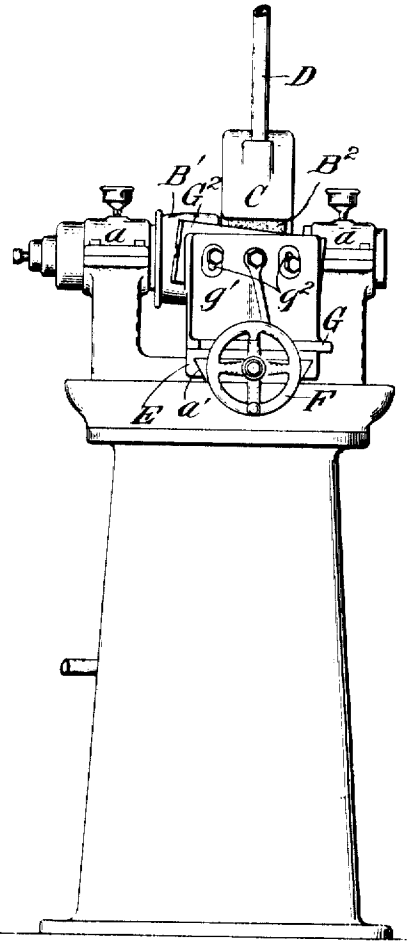


Fig. 2.

Witnesses:

Thurman Eisele

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Inventor:

Robert H. Grant,

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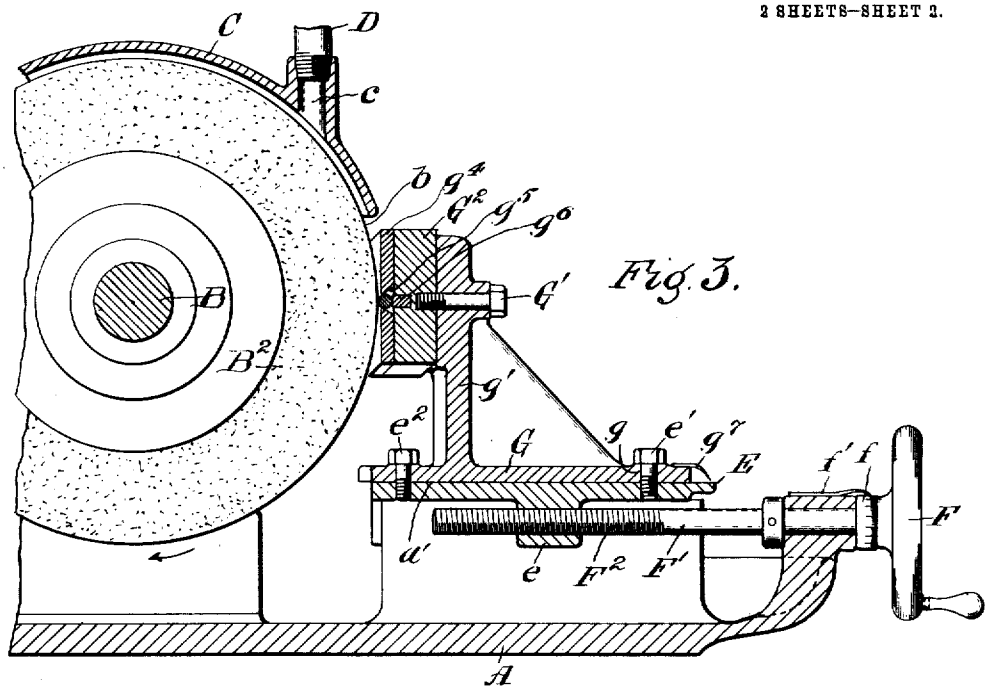


Fig. 3.

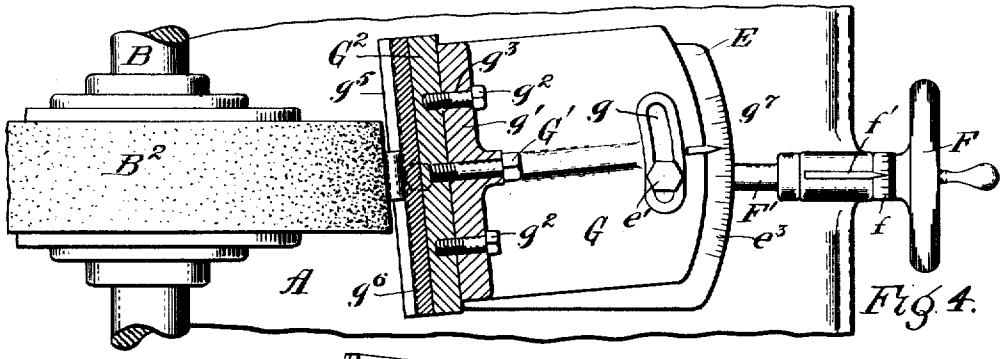


Fig. 4.

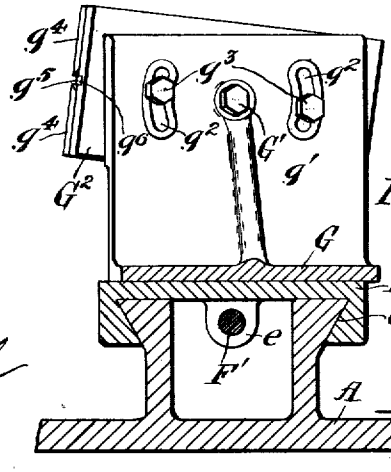


Fig. 5.

Witnesses:

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O. Findling

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Robert H. Grant,

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UNITED STATES PATENT OFFICE.

ROBERT H. GRANT, OF DETROIT, MICHIGAN, ASSIGNOR TO GRANT AUTOMATIC MACHINE COMPANY, OF DETROIT, MICHIGAN, A CORPORATION OF MICHIGAN.

GRINDING-MACHINE.

1,106,803. Specification of Letters Patent. Patented Aug. 11, 1914.

Application filed September 21, 1912. Serial No. 721,666.

To all whom it may concern:

Be it known that I, ROBERT H. GRANT, a resident of Detroit, county of Wayne, and State of Michigan, have invented a new and useful Improvement in Grinding-Machines, of which the following is a specification, the principle of the invention being herein explained and the best mode in which I have contemplated applying that principle, so as to distinguish it from other inventions.

My invention relates to grinding machines and particularly to grinding machines adapted to grind cylindrical blanks such for example, as are used for roller bearings.

The object of the said invention is to provide a machine of the said character, which will be economical and efficient in its construction and operation.

The said invention consists of means hereinafter fully described and particularly pointed out in the claims.

The annexed drawings and the following description set forth in detail certain means embodying my invention, the disclosed means, however, constituting but one of various mechanical forms in which the principle of the invention may be applied.

In said annexed drawings;—Figure 1 is a side and Fig. 2 a front elevation of a grinding machine embodying my invention. Fig. 3 is a fragmentary vertical transverse section upon an enlarged scale. Fig. 4 is a fragmentary partial horizontal section upon such enlarged scale. Fig. 5 is a fragmentary longitudinal section upon said scale.

In the illustrated embodiment of my invention, a suitable frame A is provided on which a horizontal spindle B is mounted in suitable bearings *a*, *a* carrying a suitable driving pulley B′ and the grinding-wheel B^2. The latter is of frusto-conical form and the frusto-conical surface *b*, is used as the grinding surface. A suitable hood C is secured to the frame and is provided with an orifice *c* connected with a water-pipe D from which the required water may be supplied to the grinding surface. Formed upon the said frame is a horizontal slideway *a′*, Fig. 5, upon which a slide E is mounted so as to be capable of movement toward and from the surface *b* of the wheel. Such movement is obtained through the medium of a hand-wheel F secured to a rotatable rod F′ longitudinally fixed in the frame and having a threaded portion F^2 engaging a threaded bore formed in a downwardly projecting portion *e* of said slide, in the usual manner. As is also customary a suitable scale *f* and pointer *f′*, Fig. 4, are provided to indicate the position and amount of movement of said slide.

Fixed to the rear portion of the slide E is a fixed pivot-screw e^2 having a vertical axis and forming a journal for a work-holder head G mounted in slide E, as shown in Fig. 3. The front portion of this head is formed with a segmental slot *g* through which passes a clamping screw *e′* threaded into slide E, by means of which said head may be adjustably secured to assume various positions about the said axis. Formed upon said head is an upright portion *g′* which is formed with a horizontal bore whose axis is at right angles with a vertical tangent to the surface *b*. Passing through this bore is a pivot screw G′ whose inner end is threaded and carries a work-slide block G^2. This block is formed with two segmental slots g^2 through which pass two clamping screws g^3 g^3, Fig. 5, engaging the block G^2, and by means of which the latter may be adjustably secured to assume various positions about the axis of pivot-screw G′.

The rear face of the block G^2 has secured to it, in any suitable manner, two hardened steel plates g^4 g^4, which form an under-cut groove g^5. Into this groove extends the flat face of a hard steel bearing-strip g^6 parallel with the flat face of the block. This groove forms a guide-way open at both ends of the block, as shown in Fig. 4. The head G and the described parts attached thereto constitutes what I shall hereinafter designate "the work-holder." The cross-sectional dimensions of said groove are such that the roller-blanks of the size to be operated upon, may snugly fit but freely slide therethrough in the direction of their axes. A suitable pointer g^7 and scale e^3, Fig. 4, are provided for indicating the angularity of the position of head G.

The above described device operates as follows:—The slide E is withdrawn a suitable distance from the wheel B^2 and the head G adjusted upon the slide E so as to be substantially parallel with an element of the frusto-conical grinding surface. The slide is then moved toward said surface a distance

such that the required amount of grinding will be imparted to a blank moving through the groove g^5. A blank is now inserted in that end of said groove which is on the side of the smaller base of the wheel B^2, and then moved by hand until it comes into contact with the grinding surface *b*. The inclined form of said surface and the consequent variation of the linear velocities of the succeeding circular lines of its surface causes the said blank to automatically move through said groove and hence across said lines. The speed of such movement will depend upon the degree of inclination of said groove to said lines. That is the greatest speed will be attained when said groove or its axis, is in a position parallel with the elemental lines of said surface, or in a position which is right angular with respect to said circular lines. By changing this inclination therefore, the speed of such movement may be regulated, as desired, between certain limits. In traveling through said groove the blank rotates on its axis and is supported on three parallel lines of contact, one in each of plates g^4 g^4 and one in the strip g^6, and rotates on said line. In this manner and by these means, the rollers or blanks may be efficaciously and rapidly ground to a true cylindrical surface.

Having fully described my invention, what I claim and desire to secure by Letters Patent is:—

1. In a grinding-machine, the combination of a grinding-wheel having a frusto-conical grinding surface; a work-holder having a work slide-way adjacent to and running in the general direction of an element of said surfaces; said holder being adjustable about an axis angularly related to said surface and also adjustable about an axis which lies in a plane perpendicular to the line of said first-named axis.

2. In a grinding machine, the combination of a grinding wheel provided with a peripheral grinding surface having lines of successively increasing linear velocities; a work-holder adapted to maintain contact between said lines and a work blank whereby the latter will move or tend to move in a direction transverse with respect to said lines; and means for varying the velocity of such described movement; said work-holder being adjustable toward and from said surface and in a direction at right angles with respect to the axis of the wheel.

Signed by me this 30th day of August, 1912.

ROBERT H. GRANT.

Attested by—
ALFRED C. VEIBLE,
H. W. HOLMES.

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Correction in Letters Patent No. 1,106,803.

It is hereby certified that in Letters Patent No. 1,106,803, granted August 11, 1914, upon the application of Robert H. Grant, of Detroit, Michigan, for an improvement in "Grinding-Machines," an error appears in the printed specification requiring correction as follows: Page 2, line 39, for the word "surfaces" read *surface;* and that the said Letters Patent should be read with this correction therein that the same may conform to the record of the case in the Patent Office.

Signed and sealed this 10th day of November, A. D., 1914.

[SEAL.]

R. F. WHITEHEAD,

Acting Commissioner of Patents.

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