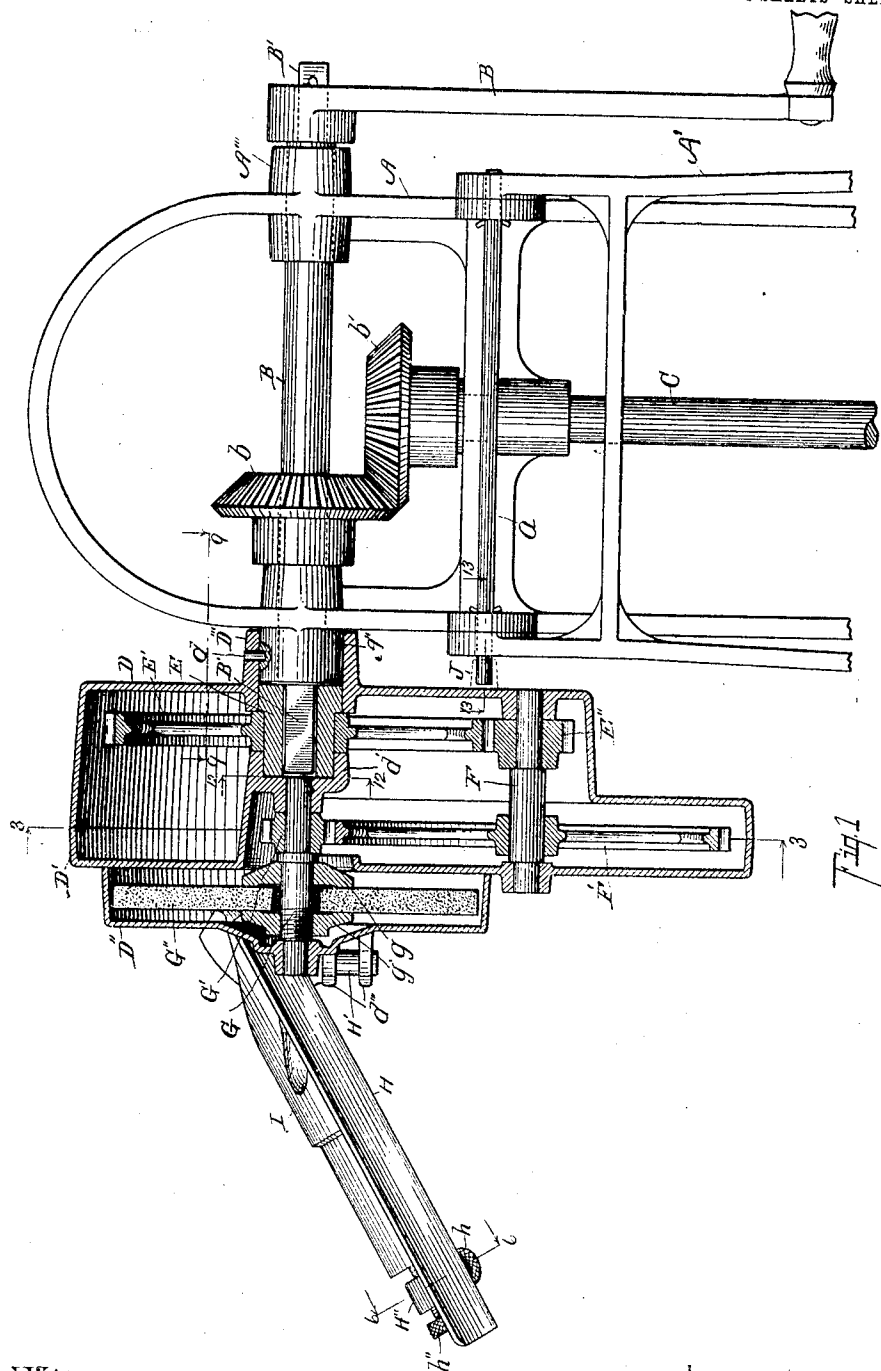


No. 871,785.

PATENTED NOV. 26, 1907.

E. COOK.
GRINDING MACHINE.
APPLICATION FILED NOV. 16, 1906.

3 SHEETS—SHEET 1.



Witnesses:

Lulu G. Greenfield
Arlaide I. Wells.

Inventor,

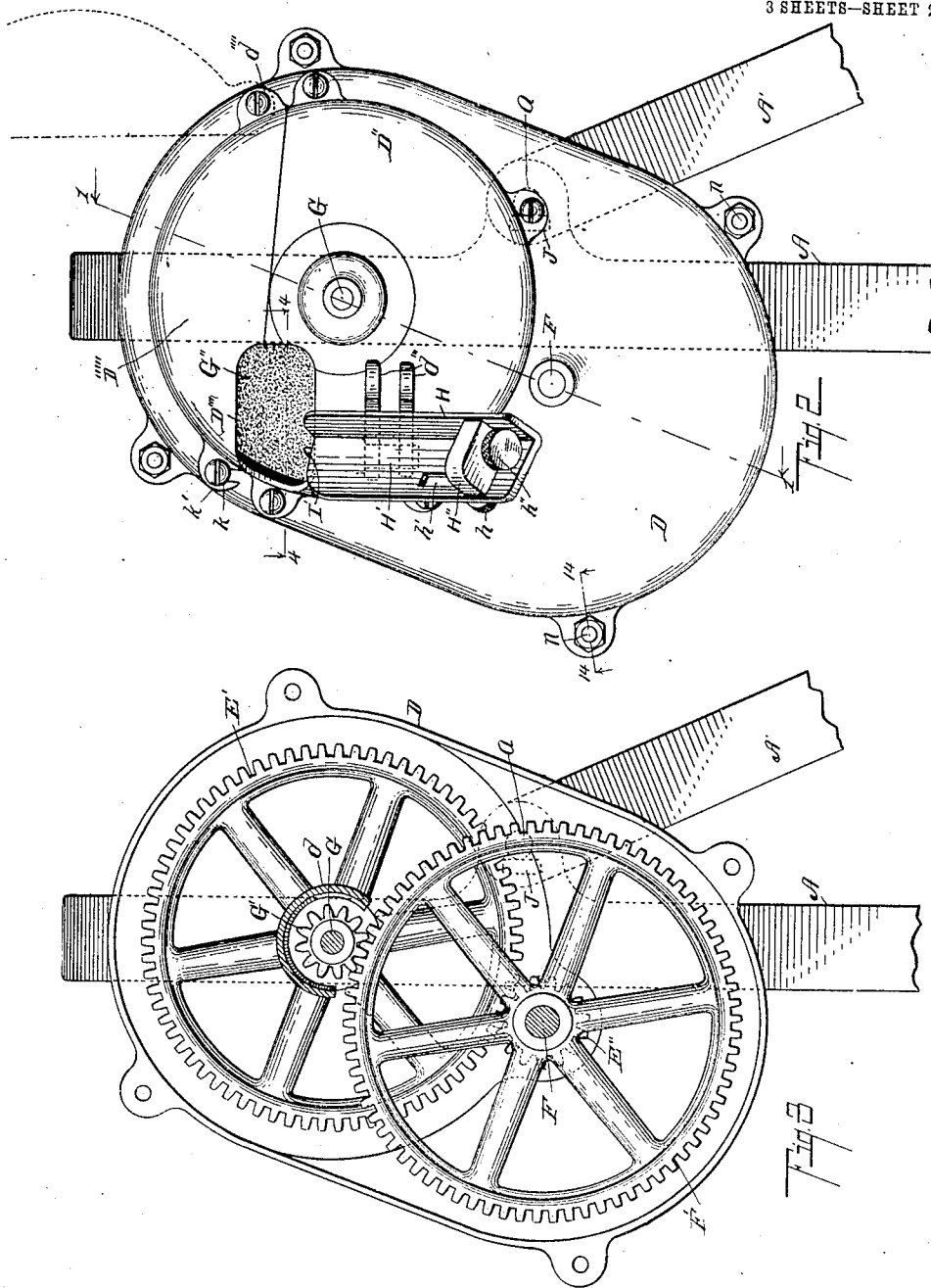
By *Ernest Cook*
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3 SHEETS—SHEET 2.



Witnesses:
Luke S. Greenfield
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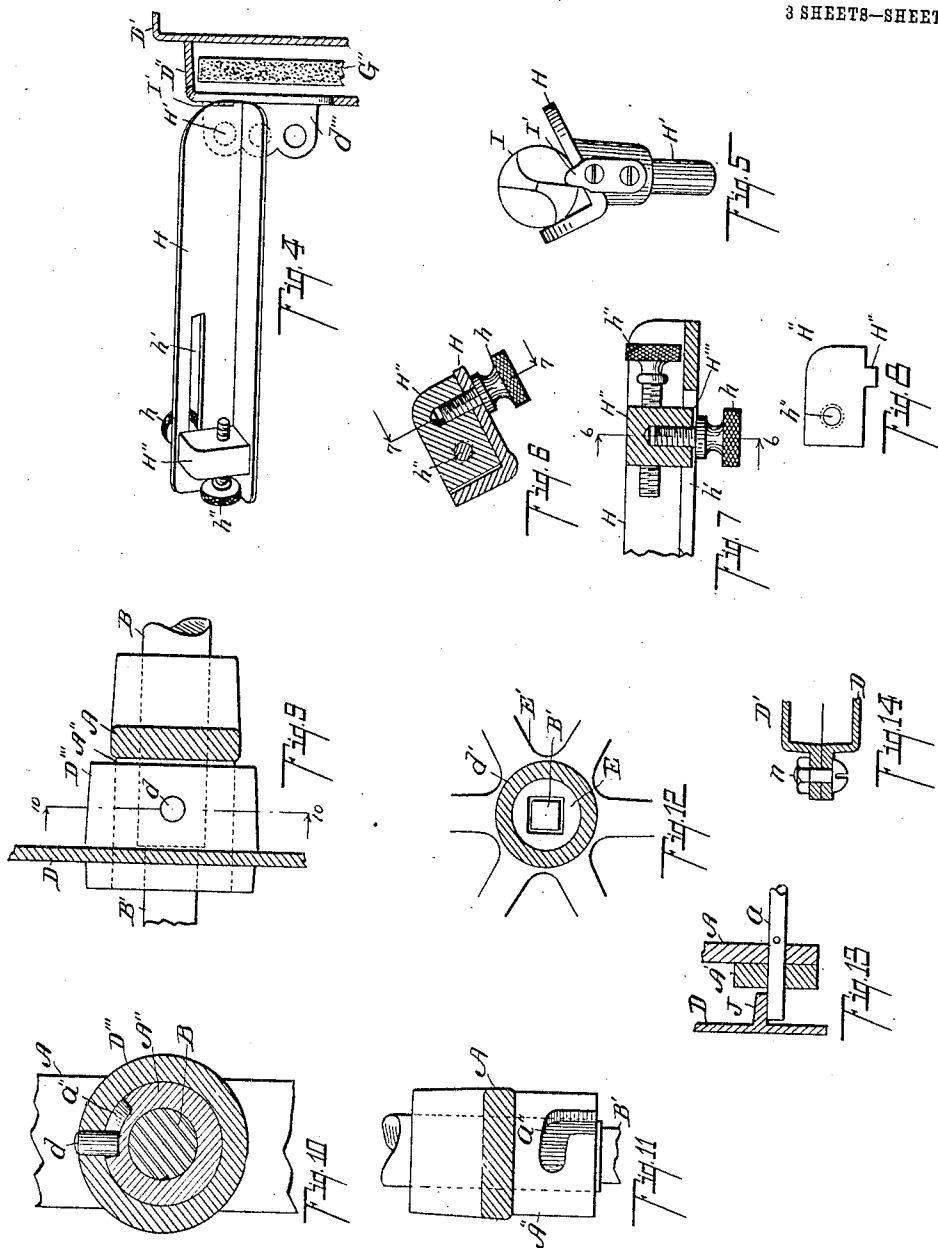
Inventor:
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3 SHEETS—SHEET 3.



Witnesses:
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UNITED STATES PATENT OFFICE.

EUGENE COOK, OF KALAMAZOO, MICHIGAN.

GRINDING-MACHINE.

Patented Nov. 26, 1907.

No. 871,785.

Specification of Letters Patent.

Application filed November 16, 1905. Serial No. 287,685.

To all whom it may concern:

Be it known that I, EUGENE COOK, a citizen of the United States, residing at Kalamazoo, in the county of Kalamazoo and State of Michigan, have invented certain new and useful Improvements in Grinding-Machines, of which the following is a specification.

This invention relates to improvements in grinding machines. It relates particularly to a grinding machine attachment for railway track drills such as is illustrated in my application for Letters Patent filed September 9, 1905, Serial No. 277,706, and I have illustrated it as applied to or in combination with such a structure, although it is desirable for use in other relations.

The objects of this invention are, first, to provide a drill grinder in combination with a railway track drill. Second, to provide an improved grinding machine adapted to be attached to a railway track drill. Third, to provide an improved grinding machine which is simple and compact in structure, and one in which the working parts are fully protected from injury.

Further objects, and objects relating to structural details, will definitely appear from the detailed description to follow.

I accomplish the objects of my invention by the devices and means described in the following specification.

The invention is clearly defined and pointed out in the claims.

A structure embodying the features of my invention is clearly illustrated in the accompanying drawings forming a part of this specification, in which—

Figure 1 is a detail sectional view of a structure embodying the features of my invention, taken on a line corresponding to line 1 1 of Fig. 2, the standard and operating means being shown in full lines. Fig. 2 is a detail side elevation looking from the left of Fig. 1, the cap portion of the casing for the grinding wheel being indicated by dotted lines in its open position. Fig. 3 is a detail vertical section taken on a line corresponding to line 3 3 of Fig. 1. Fig. 4 is a detail horizontal section taken on a line corresponding to line 4 4 of Fig. 2, showing the tool holder and its relation to the grinding wheel. Fig. 5 is a front elevation of the tool holder removed from the machine. Fig. 6 is a cross-section of the tool-holder, taken on a line corresponding to line 6 6 of Figs. 1 and 7.

Fig. 7 is a sectional view taken on line 7 7 of Fig. 6. Fig. 8 is a front elevation of the tail-block H'' of the tool-holder. Fig. 9 is an enlarged detail taken on a line corresponding to line 9 9 of Fig. 1, showing the means of securing the drill grinder in position upon the standard of the track drill and its connections to the crank thereof. Fig. 10 is a detail vertical section taken on a line corresponding to line 10 10 of Fig. 9. Fig. 11 is a detail view similar to that of Fig. 9, with the grinder removed from the standard. Fig. 12 is a detail vertical section taken on a line corresponding to line 12 12 of Fig. 1. Fig. 13 is a detail sectional view taken on a line corresponding to line 13 13 of Fig. 1, showing further details of the connection of the grinder to the frame or standard. Fig. 14 is a detail section taken on a line corresponding to line 14 14 of Fig. 2, showing structural details of the casing.

In the drawings the sectional views are taken looking in the direction of the little arrows at the ends of the section lines, and similar letters of reference refer to similar parts throughout the several views.

Referring to the drawings, A represents the standard portion of the frame of a railway track drill. A' is a supporting brace connected thereto by the pivot rod *a*. Arranged transversely of the standard in the bearings A'' A''' is a crank shaft B having irregular projecting ends B' adapted to receive the crank B''. On the shaft B is a beveled gear *b* arranged to mesh with the beveled gear *b'* on the driving shaft C of the drill, the details of which are not here illustrated. They are preferably, however, that of my improved track drill for which I have made application for Letters Patent hereinbefore mentioned.

The crank shaft bearing A'' projects outwardly to engage the projecting annular flange D''' on the casing D, the flange fitting thereon like a sleeve. The bearing A'' is provided with a spirally arranged slot *a''* adapted to receive an inwardly projecting pin *d* carried by the flange D''' of the casing, so that the flange may be slipped upon the bearing and by giving it a twisting movement it is drawn into position.

On the casing D is a projecting finger J arranged to rest against the projecting end of the pivot rod *a* when the grinder is in its operative position. Within the casing D is a bearing *d'* for the gear E', the hub E of

which is adapted to receive the irregular end B' of the shaft when the casing is in position, so that it is driven thereby. In the lower part of the casing D is a transversely arranged shaft F on which there is a pinion E'' arranged to mesh with the gear E. The shaft F also carries a gear F'. The casing or shell D also contains a bearing for one end of the shaft G of the grinding wheel G''. The grinding wheel G'' is incased in a shell or casing D'' secured upon the side of the gear casing D. The casing D'' is provided with a suitable bearing for the outer end of the shaft G. On the inner end of the shaft G is a pinion G' arranged to mesh with the gear F'. By this train of gears I am enabled to drive the grinding wheel at a very high rate of speed with a comparatively slow speed of the shaft B.

The grinding wheel is clamped upon the shaft G by the blocks *g g'* between which it is arranged. The grinding wheel casing D'' is provided with an opening D''' to receive the drill to be ground. On the casing D'' is a pair of outwardly projecting plate-like brackets d''', having perforations therein to receive the journal H' of the tool-holder H. The tool holder H is arranged in an inclined position, or at an acute angle in relation to its journal, so that the drill resting therein—as is indicated in Fig. 1 of the drawing—is presented to the grinding wheel at the proper angle.

The drill holder consists of a V-shaped trough adapted to receive the drill, as I, to be ground. At the forward end of the holder is a lip rest I' which projects upwardly in position to engage one of the flukes of the drill I. (See Fig. 5.) The journal H' of the drill holder is placed at one side of the center line thereof, so that as the holder is rocked on its pivot, the point of the drill is presented to the grinding wheel to secure the desired clearance. The drill holder H is provided with an adjustable tail-piece H''. This tail-piece is provided with a downwardly projecting lug H''' which is arranged in the longitudinal slot *h'* in the drill holder. A set screw *h* is provided for adjustably securing the tail-piece H'' in its adjusted positions, said screw being arranged through the slot *h'*, as clearly appears in Figs. 6 and 7.

In order to secure more perfect adjustment of the drill to the grinding wheel, the block H'' is provided with a thumb-screw *h''* adapted to engage the end of the drill. It is evident that the tail-piece may be adjusted to accommodate long or short drills, and the thumb-screw *h''* can be used for the finer adjustments.

The brackets d''' are preferably provided with several bearing holes for the pivot H' of the drill holder, so that it may be adjusted to utilize practically the entire face of the grind-

ing wheel. The upper portion D'''' of the casing D'' of the grinding wheel is in the form of a cover, and is hinged at d'''' so that it may be opened to expose the periphery of the grinding wheel, and also a greater portion of its face, should it be desired to utilize it for grinding knives, chisels, and the like. This cover is preferably provided with a hook *k* arranged to engage the set screw *k'*, so that the cover for the grinding wheel may be effectively locked in its closed position.

In the operation of track drills it is found that owing to the conditions under which the same are operated, the drills used are very soon dulled. It is a very great inconvenience to carry a supply sufficient for a day's work, and also, where a number of drills are carried they are more likely to become lost.

In my improved drill grinder I have provided a structure which is readily portable and which can be quickly attached or detached to the track drill, which furnishes a suitable support therefor and a convenient operating means.

The operative parts of my improved grinder are fully protected and at the same time the structure is very compact and light and can be readily transported to the place of operating the drill without particular inconvenience and without danger of injury to the grinder itself. The gear are protected from the dust from the grinding wheel so that the wear thereon is reduced to a minimum.

While I have particularly designed my improved grinder to be applied to my track drill hereinbefore mentioned, I desire to remark that it is applicable for use in other relations, and I desire to claim the same specifically in this relation as well as broadly.

Having thus described my invention, what I claim as new and desire to secure by Letters Patent, is:

1. The combination of a standard; a power-shaft arranged transversely thereon, a projecting bearing for said shaft having a spirally arranged groove therein; a casing D having an outwardly projecting annular sleeve-like flange thereon, adapted to receive the said projecting bearing, said flange having an inwardly projecting pin arranged thereon to engage the said spiral groove; a bearing in said casing arranged in alinement with the said flange thereon; a gear E' having a hub E mounted in said bearing in said casing, said hub being arranged to receive the end of said crank shaft; a shaft F arranged in the lower portion of said casing; a pinion E'' thereon arranged to mesh with said gear E'; a gear F' mounted on said shaft F; a grinding wheel shaft G; a bearing in said casing for the inner end thereof; a grinding wheel mounted on said shaft G; and a casing D'' for said grinding wheel secured upon the side of said casing D, having a bearing for the outer end

of said grinding wheel shaft, all coacting for the purpose specified.

2. The combination of a standard; a power-shaft; a projecting bearing for said shaft, having a spirally arranged groove therein; a casing having an outwardly projecting annular sleeve-like flange thereon adapted to receive the said projecting bearing, said flange having an inwardly projecting pin thereon arranged to engage the said spiral groove; a bearing in said casing arranged in alinement with the said flange thereon; a driven gear mounted in said bearing in said casing, arranged to receive the end of said crank-shaft; a grinding wheel shaft; a bearing in said casing for the inner end thereof; a grinding wheel mounted on said shaft; a train of multiplying gear connecting said driven gear to said grinding wheel, arranged in said casing; and a casing D'' for said grinding wheel secured upon the side of said casing D, having a bearing for the outer end of said grinding wheel shaft, said casing having an opening in the side thereof, all coacting for the purpose specified.

3. The combination of a standard; a power shaft; a projecting bearing for said shaft, having a spirally arranged groove therein; a casing having an outwardly projecting annular sleeve-like flange thereon adapted to receive the said projecting bearing, said flange having an inwardly projecting pin thereon arranged to engage the said spiral groove; a bearing in said casing arranged in alinement with the said flange thereon; a driven gear mounted in said bearing in said casing, arranged to receive the end of said crank shaft; a grinding wheel; and a train of multiplying gear connecting said driven gear to said grinding wheel, arranged in said casing, all coacting for the purpose specified.

4. The combination of a standard; a

power shaft; a casing; a driven gear adapted to receive the end of said power shaft, arranged in said casing; means for detachably securing said casing to said standard; a grinding wheel, and a train of multiplying gears also mounted in said casing for connecting said grinding wheel to said driven gear, for the purpose specified.

5. The combination with a casing, of a driven gear arranged therein; a shaft F arranged in the lower portion of said casing; a pinion E'' arranged to mesh with said driven gear; a gear F' mounted on said shaft F; a grinding wheel shaft G; a bearing in said casing for the inner end thereof; a grinding wheel mounted on said shaft G; and a casing D'' for said grinding wheel, secured upon the side of said main casing, having a bearing for the outer end of the grinding wheel shaft and a hinged cover portion, for the purpose specified.

6. The combination with a casing, of a driven gear arranged therein; a shaft F arranged in the lower portion of said casing; a pinion E'' arranged to mesh with said driven gear; a gear F' mounted on said shaft F; a grinding wheel shaft G; a bearing in said casing for the inner end thereof; a grinding wheel mounted on said shaft G; and a casing D'' for said grinding wheel secured upon the side of said main casing, having a bearing for the outer end of the grinding wheel shaft, for the purpose specified.

In witness whereof, I have hereunto set my hand and seal in the presence of two witnesses.

EUGENE COOK. [L. s.]

Witnesses:

OTIS A. EARL,
A. J. ALBER.