

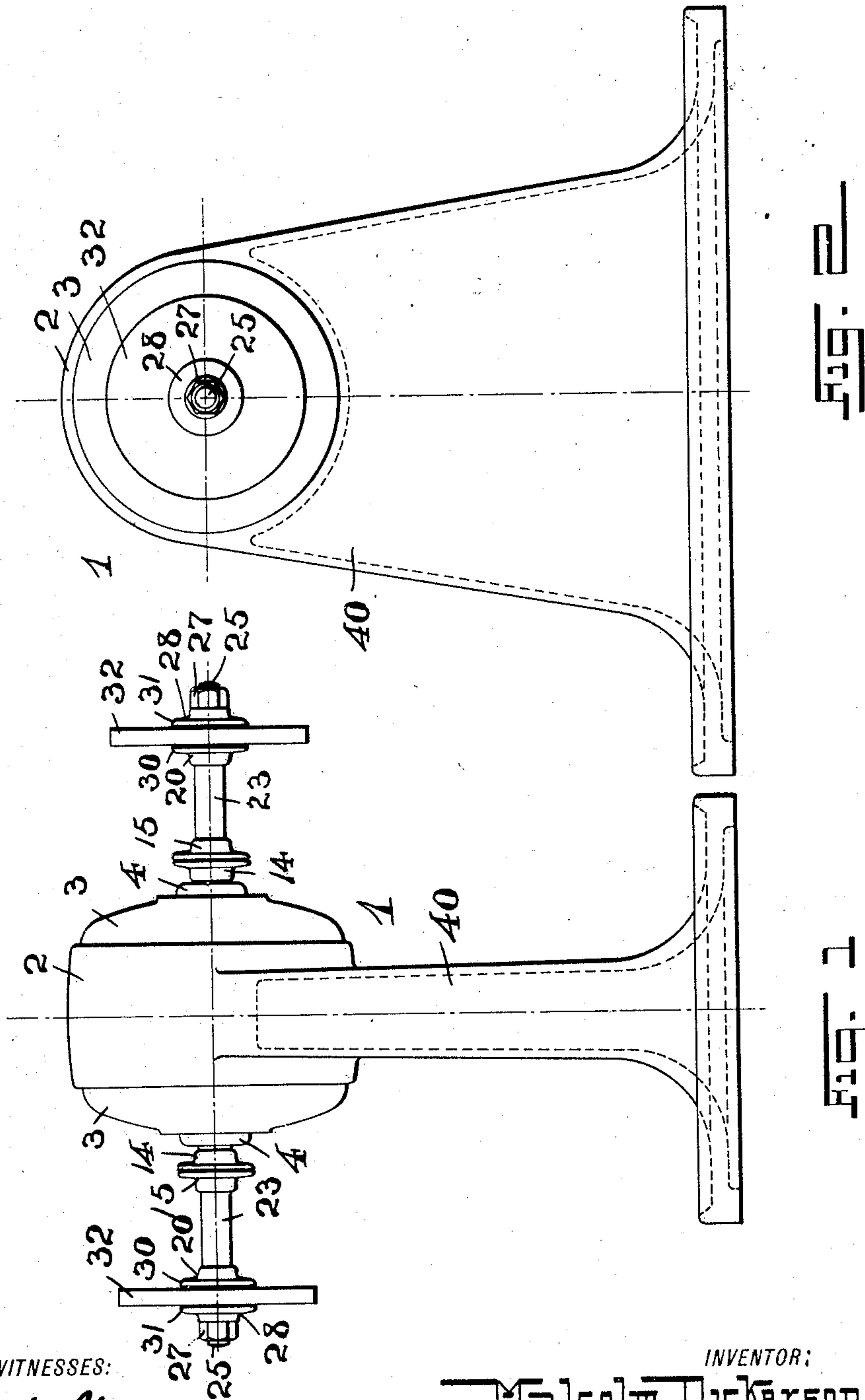
No. 881,465.

PATENTED MAR. 10, 1908.

M. DICKERSON.
GRINDING MACHINE.

APPLICATION FILED OCT. 4, 1905.

3 SHEETS—SHEET 1.



WITNESSES:

Geo. L. Richards
Harvey H. Hutton

INVENTOR:

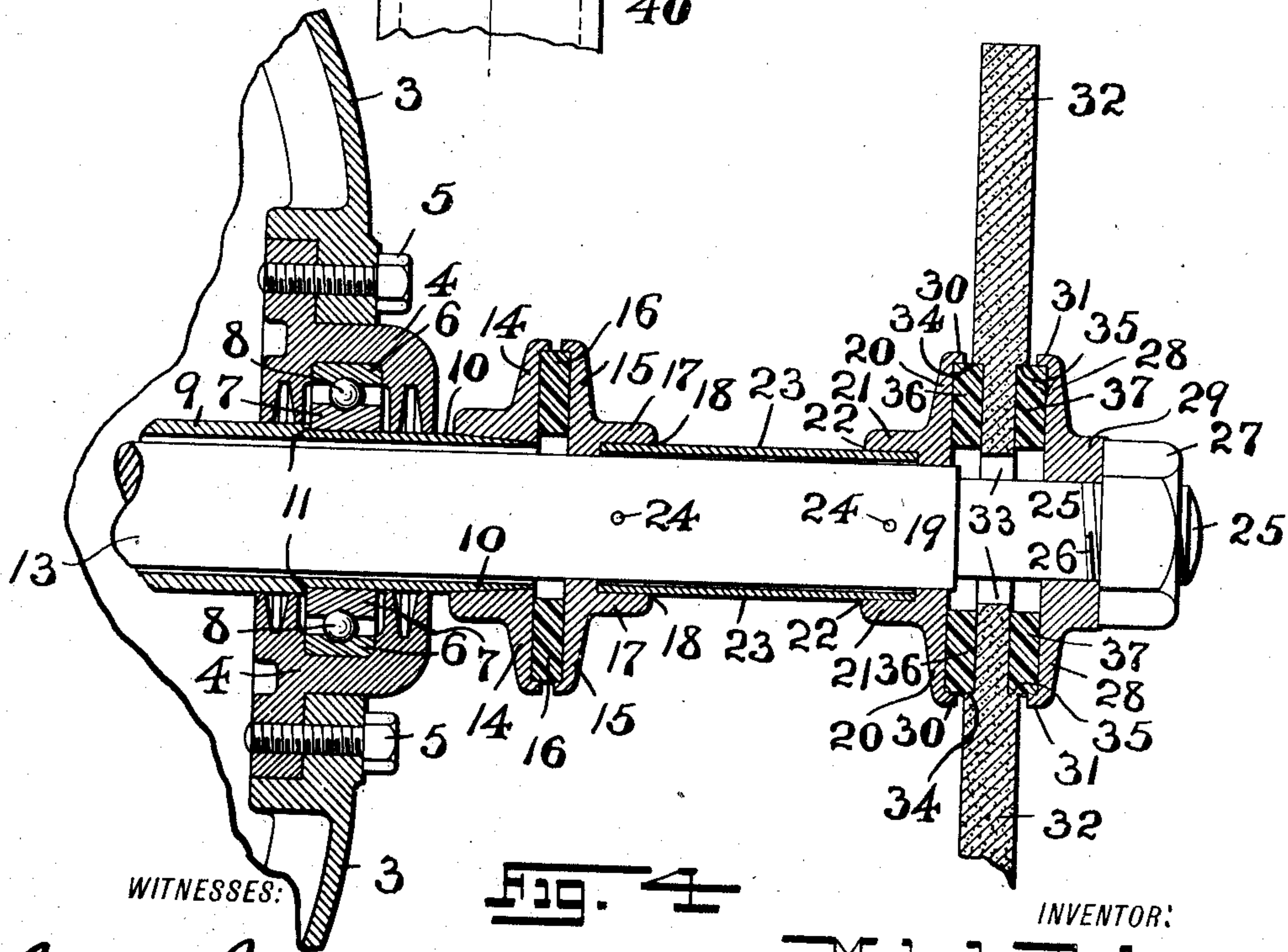
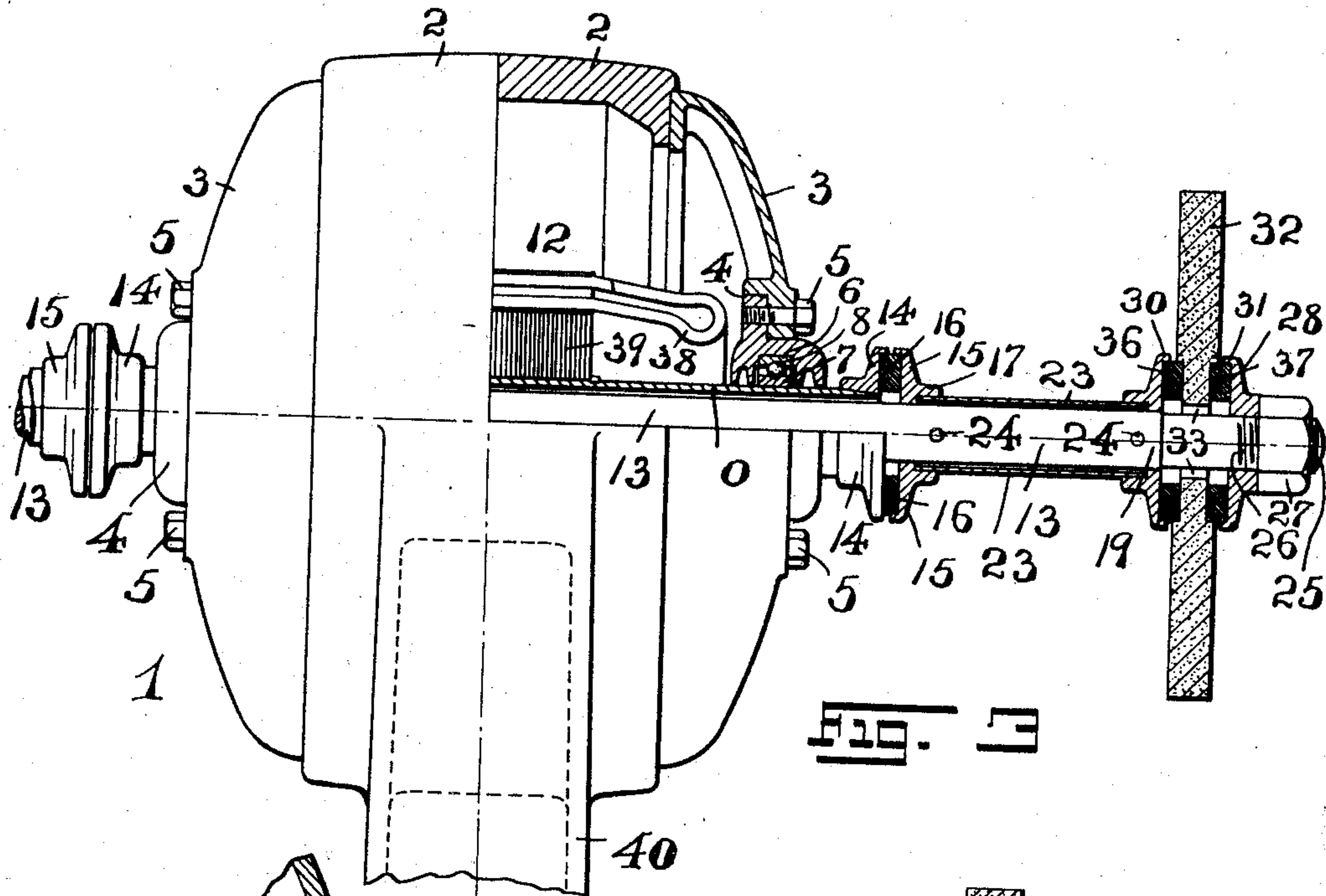
Malcolm Dickerson,
BY
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ATTORNEY

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WITNESSES:

Geo. L. Richards
Harry G. Hutton

Fig. 4

INVENTOR:

Malcolm Dickerson
BY *Fred C. Fraentzel*
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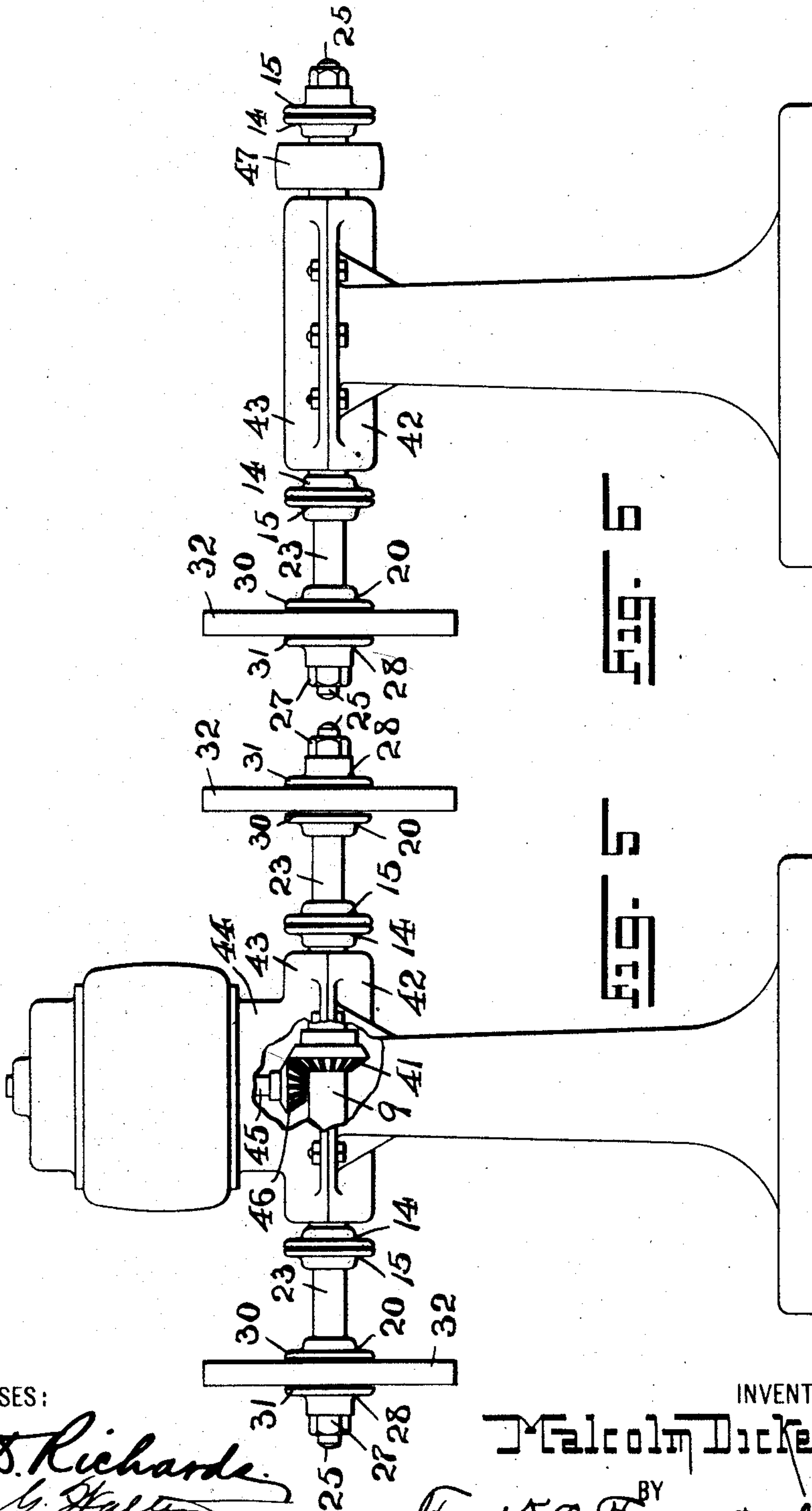
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3 SHEETS—SHEET 3.



WITNESSES:

Geo. D. Richards
Harry B. Hall

INVENTOR:

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UNITED STATES PATENT OFFICE.

MALCOLM DICKERSON, OF NEWARK, NEW JERSEY, ASSIGNOR OF ONE-HALF TO FREDERICK L. LUZ, OF NEWARK, NEW JERSEY.

GRINDING-MACHINE.

No. 881,465.

Specification of Letters Patent.

Patented March 10, 1908.

Application filed October 4, 1905. Serial No. 281,225.

To all whom it may concern:

Be it known that I, MALCOLM DICKERSON, a citizen of the United States, residing at Newark, in the county of Essex and State of New Jersey, have invented certain new and useful Improvements in Grinding-Machines; and I do hereby declare the following to be a full, clear, and exact description of the invention, such as will enable others skilled in the art to which it appertains to make and use the same, reference being had to the accompanying drawings, and to letters of reference marked thereon, which form a part of this specification.

My present invention relates to improvements generally in grinding machines; and the invention has reference, more particularly to an arrangement of cushion mountings for grinding machines, with this main object of the invention in view, that with a cushion-mounted grinding or emery wheel or disk, a flexible and vibratory relation is produced between the grinding surface of the wheel and the work which is being ground, thereby resulting in many advantages to both the grinding or emery wheel and the work, as will hereinafter more fully appear.

This invention has for its principal objects to provide a novel means for mounting a grinding or emery wheel or disk upon a shaft, the mountings and grinding-wheels or disks being cushioned in such a manner, that a simple and cheap arrangement of the parts is produced, with a view of removing from the grinding-wheel or disk and the work sudden shocks incident to any unevenness between the work and the grinding surface of the wheel or disk, or owing to any harder part existing in the casting or body of such work which has to be ground.

My invention has for its further purposes, the prolongation of the life of grinding or emery wheels, by the use of cushion mountings as shown and hereinafter more fully set forth, and a consequent reduction of care and labor required and caused by the consequent springing of the shaft and other parts, where the grinding or emery wheel or disk is rigidly secured upon the shaft. By an arrangement of cushion-mountings, as hereinafter set forth, the life of the grinding or emery wheel or disk is doubled, requiring less truing up than does a rigidly mounted wheel or disk, and consequently resulting in a

larger output of work, with greater ease and comfort to the workman.

A further object of this invention is to provide a machine of the general character hereinafter set forth, comprising a sleeve running in bearings with fixed centers, a shaft running through the sleeve, and normally concentric therewith, a clearance-space between the shaft and sleeve to allow of lateral movement of the shaft relative to the sleeve, and suitable source of energy or driving means for imparting rotary motion to the said sleeve, a flexible coupling or mounting between said sleeve and shaft to impart motion to the shaft, and a flexibly-mounted grinding or emery wheel or disk, all for the purposes to be hereinafter more particularly described.

Other objects of the present invention not at this time more particularly specified will be clearly understood from the following detailed description of my invention.

The invention consists, therefore, in the novel cushion-mounted or flexible grinder hereinafter more fully set forth; and, furthermore, this invention consists in the various novel arrangements and combinations of devices and parts, as well as in the details of the construction of the same, all of which will be hereinafter more fully described, and then finally embodied in the clauses of the claim which are appended to and which form an essential part of this specification.

The invention is clearly illustrated in the accompanying drawings, in which:—

Figures 1 and 2 are a front view and side elevation, respectively, of one form of grinding-machine provided with a cushion mounted grinding or emery-wheel, embodying the principles of my present invention. Fig. 3 is a view, on an enlarged scale, of the casing of a grinding machine, and the cushion-mounted grinding or emery wheel or disk, certain parts being shown in elevation and other parts being represented in section. Fig. 4 is a detail sectional representation, on a still larger scale, of a portion of the casing of the machine, the cushion mounting for the grinding or emery wheel or disk, and an end-portion of the main shaft on which said parts are arranged, said shaft being shown in elevation. Figs. 5 and 6 are two elevations of grinding-machines provided with cushion-mounted grinding or emery wheels, but showing two other main sources of energy

or driving means, different from that indicated in the construction of machine represented in said Figs. 1 to 4 inclusive.

Similar characters of reference are employed in all of the said above described views, to indicate corresponding parts:

Referring now to the several figures of the drawings, the reference-character 1 indicates a complete grinding machine, that in said Figs. 1 to 4 inclusive comprising a suitable casing or shell 2 formed with end-pieces 3 and suitable bearings 4 centrally secured to said end-pieces 3 by means of bolts or screws 5, or in any other suitable manner. Within each bearing 4 are a pair of ball-bearing rings 6 and 7, with anti-friction balls or rollers 8 between them, said ring 7 being suitably slipped upon a slightly tapered end-portion 10 of a sleeve or tube 9, and suitably secured against a shoulder 11 of said sleeve or tube 9, substantially as illustrated in Fig. 4 of the drawings. Rotary motion of this sleeve or tube 9 is produced by means of any suitably constructed motor, as 12, which is arranged within the said casing or shell 2, and as shown in Fig. 3 of the drawings. Concentric with the said sleeve or tube 9 is a main shaft or spindle 13, the parts being so arranged that there will be an air-space between them, substantially as shown. The means for producing a rotary motion of the said shaft 13 is a cushion mounting comprising a pair of flanged disks or plates 14 and 15 with a soft flexible ring 16 of rubber or other analogous material placed between the said disks or plates 14 and 15. The said disk or plate 14 is suitably secured upon the end of said sleeve or tube 9, while the said disk or plate 15 is arranged and secured upon the said shaft or spindle 13, substantially in the position shown in said Figs. 1, 3 and 4 of the drawings. The said flexible ring or cushion 16 is compacted between the flat faces of said two disks or plates 14 and 15, and by the frictional contact or engagement between the faces of the said parts, the rotary motion of the sleeve or tube 9 and its disk or plate 14 is conveyed through the agency of said ring or cushion 16 and the disk or plate 15 to the shaft or spindle 13. The said disk or plate 15 is also provided with a hub 17 having a receiving socket 18, the internal diameter of which is slightly larger than the diameter of the said shaft or spindle 13. Suitably arranged near the free end-portion 19 of said shaft or spindle 13 is another disk or plate 20, said disk or plate being provided with a hub 21 having a receiving socket 22. The internal diameter of said receiving socket 22 is also slightly larger than the diameter of the shaft or spindle 13, substantially as shown. Concentric with the said main shaft or spindle 13, and forming an air-space with said shaft or spindle, is another sleeve or tube 23, having its respective ends snugly fitted in the

said sockets 18 and 22 of the respective disks or plates 15 and 20, and then secured upon the shaft or spindle 13 preferably by means of pins 24. Extending from the end-portion 19 of the said shaft or spindle 13 is a stud or end-piece 25 formed integrally with said end-portion 19, and preferably provided with a screw-thread 26 for the reception thereon of a tightening nut 27. Suitably arranged upon the said stud or end-piece 25 is another disk or plate 28, having a hub 29 against which the said nut 27 can be screwed. Both of the said disks or plates 20 and 28 are respectively provided with annular flanges 30 and 31, which extend toward each other, as shown. Concentric with the said stud or end-piece 25 and having a central opening 33 of a larger diameter than the diameter of the stud or end-piece 25 is a grinding or emery wheel or disk 32, which is preferably provided upon its opposite faces with recessed or undercut parts forming the annular shoulders or off-sets 34 and 35. Between the inner face of the said disk or plate 20 and the face of the grinding or emery wheel or disk, with its circumferential edges fitted beneath the flange 30 and the shoulder 34 is a flexible ring or cushion 36 of soft rubber or other analogous material, and between the inner face of the disk or plate 28 and the other face of the grinding or emery wheel or disk, with its circumferential edges fitted beneath the flange 31 and the shoulder 35 is another flexible ring or cushion 37 of soft rubber, or other analogous material. Thus it will be evident, that the said grinding or emery wheel or disk is cushion mounted, and rotates with the main shaft or spindle 13, by the frictional engagement between the several parts, when the nut 27 is tightened against the hub of the disk 28.

Any vibratory action between the parts and between the grinding surface of the wheel or disk and the work, as well as that of the various parts of the devices being taken up by the cushioning devices, it will be understood, that the principal results will be prolongation of the life of the emery or grinding wheel or disk, and a consequent reduction of care, with a larger output of work and greater ease and comfort to the workman.

Although I have described the grinding machine with but one arrangement of cushion-mounted grinder upon one end of the shaft or spindle 13, it will be clearly evident that the said shaft or spindle may be extended upon the other side of the machine, and the grinding or emery wheel or disk and cushioning devices duplicated upon said extended end of the shaft, as clearly indicated in Fig. 1 of the drawings. In the device shown in said Figs. 1 to 4 inclusive, the shell or casing 2 forms the usual magnetic frame or yoke of the electric driving ma-

chine, the windings and core of the armature of the electric motor being respectively indicated by the reference-characters 38 and 39, and 40 indicates any suitable standard or base which extends from the said shell or casing 2.

10 Instead of arranging the driving power in the manner hereinabove described, the sleeve 9 of the shaft or spindle 13 may be provided with a miter or bevel-gear 41, and the casing may be made in sections 42 and 43 which are suitably secured together; one of said sections, as 43, having an extension 44 provided with a motor, of any known 15 construction, the shaft 45 of said motor having thereon a bevel or miter pinion 46 which is in mesh with the bevel gear 41, substantially as shown in Fig. 5 of the drawings.

20 In Fig. 6, I have illustrated the application of my invention to a grinding machine having a belt-driven shaft, the belt being passed over a suitable pulley-wheel 47, at one end or other suitable portion of 25 the main shaft of the machine.

Having thus described my invention, what I claim is:—

30 1. In a grinding machine, the combination, with a sleeve running in bearings with fixed centers, a shaft running through said sleeve, and normally concentric therewith,

means for imparting motion to said sleeve, a flexible coupling on said sleeve to impart motion to said shaft, a grinding wheel, and a cushion-mounting for mounting said wheel 35 on said shaft, substantially as and for the purposes set forth.

2. In a grinding machine, the combination, with a sleeve running in bearings with fixed centers, a shaft running through said 40 sleeve, and normally concentric therewith, said sleeve being provided with a clearance space between the same and said shaft to allow of a lateral motion of the shaft relative to said sleeve, means for imparting 45 rotary motion to the sleeve, a flexible coupling at the end of said sleeve to impart motion to the shaft, a second flexible coupling on said shaft, a second sleeve concentric with said shaft, said second sleeve being connected at its ends with said flexible couplings, and a grinding wheel mounted in said 50 second flexible coupling, substantially as and for the purposes set forth.

In testimony, that I claim the invention 55 set forth above I have hereunto set my hand this 23rd day of September, 1905.

MALCOLM DICKERSON.

Witnesses:

FREDK. C. FRAENTZEL,
GEO. D. RICHARDS.