

No. 681,440.

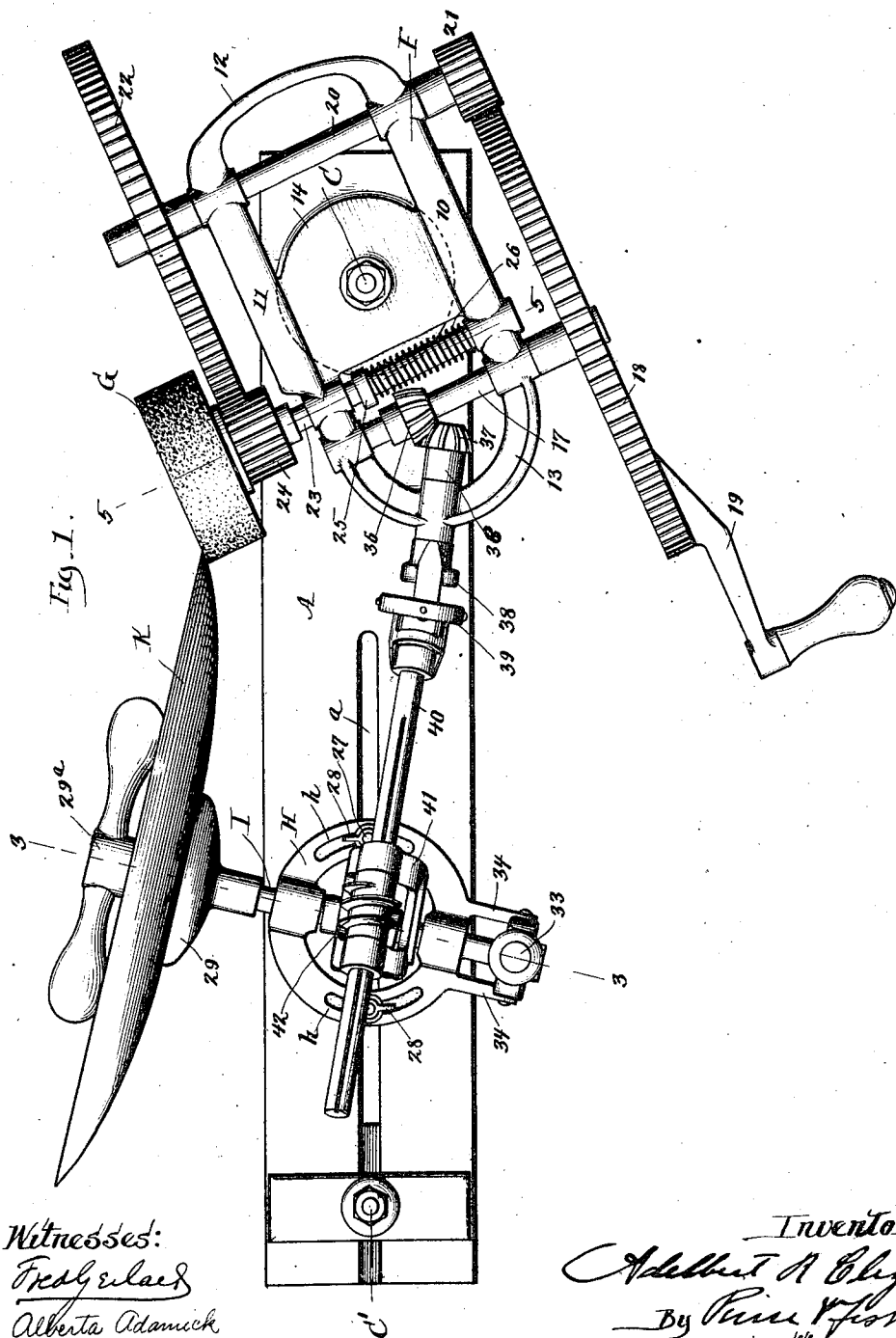
Patented Aug. 27, 1901.

A. R. CLIZBE.
GRINDING MACHINE.

(Application filed Nov. 28, 1900.)

(No Model.)

4 Sheets—Sheet 1.



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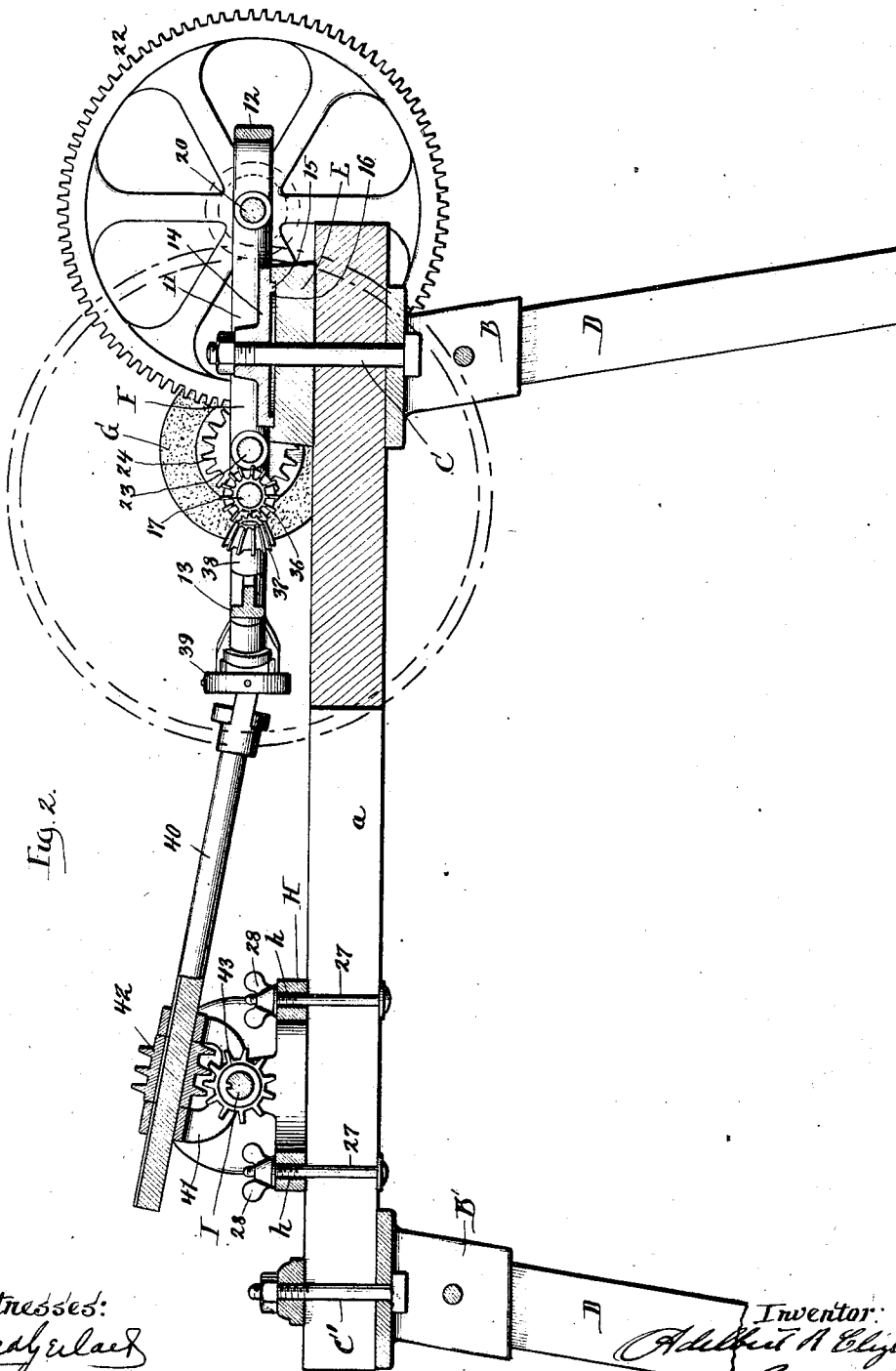
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4 Sheets—Sheet 2.



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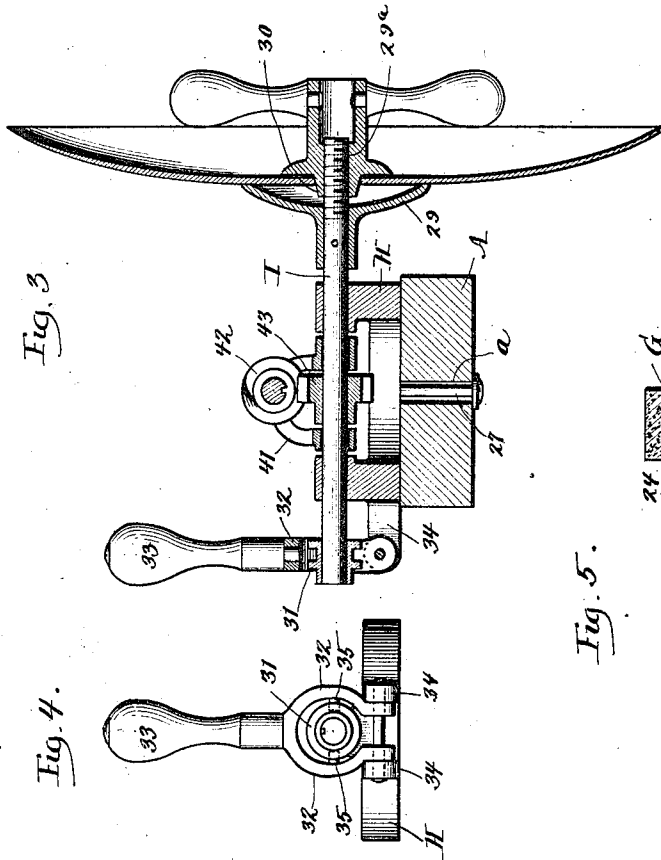
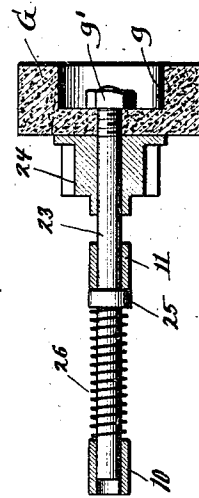
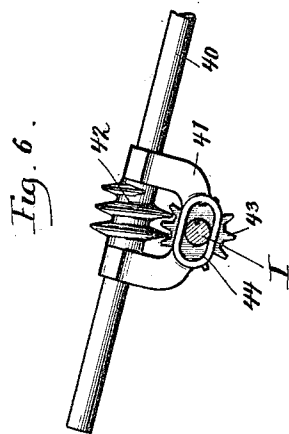
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4 Sheets—Sheet 3.



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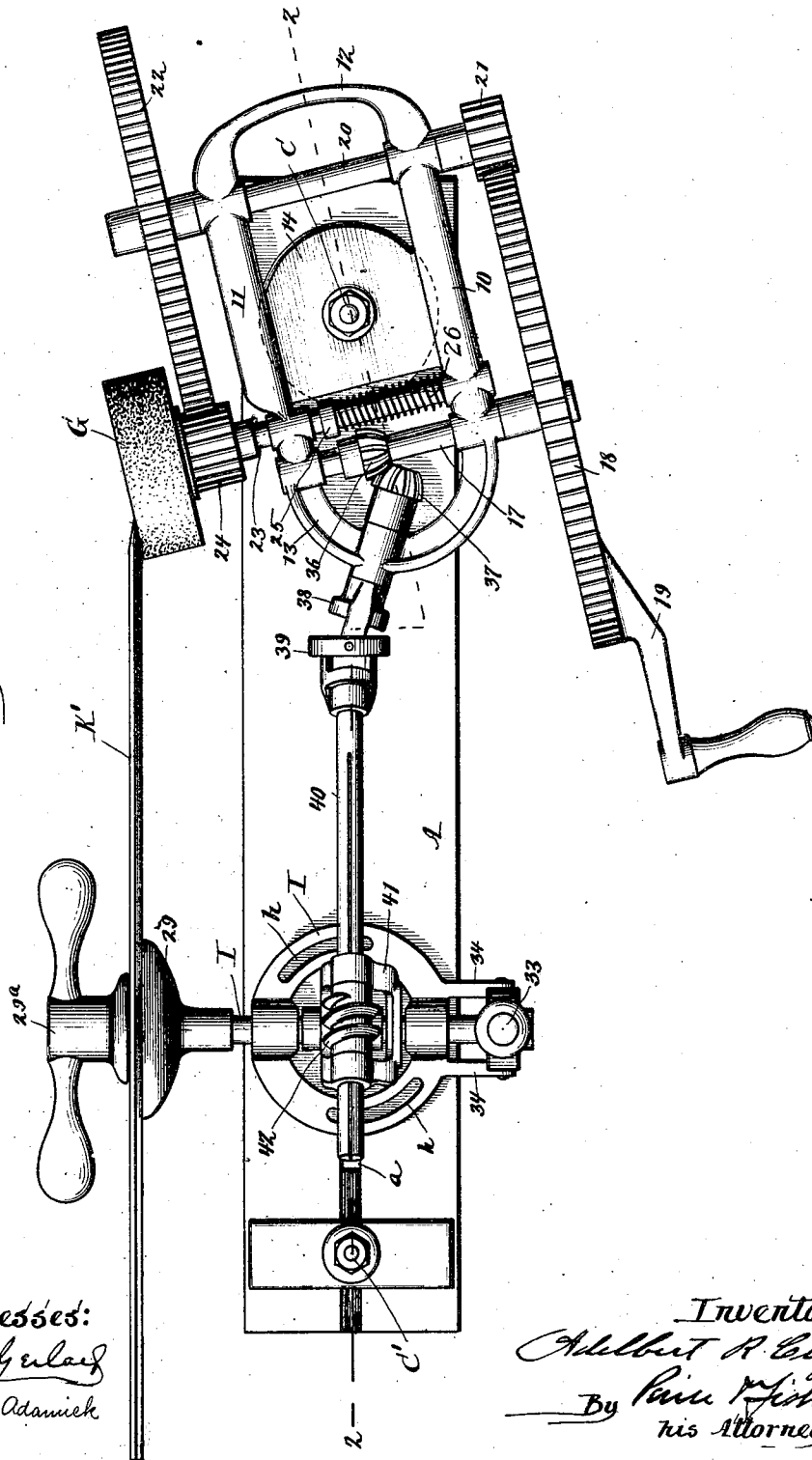
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(No Model.)

4 Sheets—Sheet 4.

Fig. 7.



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UNITED STATES PATENT OFFICE.

ADELBERT R. CLIZBE, OF PLYMOUTH, INDIANA.

GRINDING-MACHINE.

SPECIFICATION forming part of Letters Patent No. 681,440, dated August 27, 1901.

Application filed November 28, 1900. Serial No. 38,015. (No model.)

To all whom it may concern:

Be it known that I, ADELBERT R. CLIZBE, a citizen of the United States, and a resident of Plymouth, in the county of Marshall and State of Indiana, have invented certain new and useful Improvements in Grinding-Machines, of which I do declare the following to be a full, clear, and exact description, reference being had to the accompanying drawings, forming a part of this specification.

The object of the present invention is to provide an improved construction of grinding-machine which, while capable of use for a variety of other purposes, is more especially designed for the grinding of harrow-disks, revolving plow-colters, and the like.

The invention consists of the various novel features of construction hereinafter described, illustrated in the accompanying drawings, and more particularly pointed out in the claims at the end of this specification.

Figure 1 is a plan view of my improved construction, showing the parts in position for grinding a dished harrow-disk. Fig. 2 is a view in sectional elevation of the same on line 2 2 of Fig. 7. Fig. 3 is a detail sectional view on the line 3 3 of Fig. 1. Fig. 4 is a view in side elevation of a part of the structure shown in Fig. 3. Fig. 5 is a detail sectional view on line 5 5 of Fig. 1. Fig. 6 is a detail view of a part of the structure shown in Fig. 3; and Fig. 7 is a view similar to Fig. 1, showing the part in position for grinding a flat disk.

The frame of the machine consists of a bed-plate A, provided at either end with castings B B', secured thereto by bolts C C', and to which are suitably fastened the supporting-legs D D.

Mounted on a circular plate or casting E is a gear-support F, both of which are secured to the bed-plate by bolt C. The support F consists of side pieces 10 and 11, curved end pieces 12 and 13, and central plate 14, all preferably cast integrally. The plate 14 is provided with a downwardly-projecting circular rib 15, which fits within a corresponding depression 16 in the plate E. By loosening the nut on bolt C the support F may be adjusted rotatably to any desired angular position.

Mounted in suitable bearings in support F are the drive-shaft 17, carrying the gear 18

and operating-handle 19, the counter-shaft 20, carrying pinion 21 and gear 22, and the grinding-wheel shaft 23, carrying the grinding-wheel G and pinion 24. The pinion 21 gears with the gear 18 and the pinion 24 with the gear 22, so that by means of the handle 19 the grinding-wheel G may be driven at a high speed. The outer flat face of the wheel G is employed as a grinding-face, and in order to provide for wear this face is provided with a recess *g* (see Fig. 5) for the nut *g'*, by which the wheel is secured to the shaft 23. The support F and wheel G are set at an angle to the length of the bed-plate A, so that the grinding-face of the wheel will accurately engage with the bevel of the disks to be ground. The extent of this angle, as before stated, is adjustable to provide for grinding disks of varying sizes. In order that the wheel G may accommodate itself to disks having irregular edges, either because they have been sharpened in the usual way by a blacksmith or because they have been bent in any way, the shaft 23 is loosely mounted in the bearings and permits of a certain amount of longitudinal movement, limited by the pinion 23 and the collar 25 on either side of one of the bearings. A light cushion-spring 26 is placed about the shaft 23 between the collar 25 and one of the sides of support F, which tends to push the wheel G outwardly against the disks to be ground.

The end of the base-plate A opposite the gear-support is provided with a longitudinal slot *a*, above which is mounted the circular disk-holder support H. Bolts 27, having winged nuts 28, pass through the slot *a* in the base-plate A and through arc-shaped slots *h* in the disk-holder support H, by means of which the support may be longitudinally adjusted to and from the gear-support F and wheel G to provide for disks of varying sizes and rotatably adjusted about a vertical axis, so that the disk shall be presented at the proper angle to the grinding-wheel G.

Loosely mounted in suitable bearings in the support H is the disk-holder I, so as to be revolvable and longitudinally movable therein. The holder I is provided at one end with a fixed flange 29 and the flanged hand-nut 29^a, by means of which the disk K is held in place.

The nut 29* is provided with a conical projection 30, adapted to fit holes of varying sizes in the center of the disks. The opposite end of the revoluble disk-holder I is provided with a grooved collar 31, which is surrounded by the bent forks 32 of handle 33. These forks are pivoted to projections 34 of the circular support II and provided with projections 35, engaging the grooved collar 31. By this means the disk-holder may be moved longitudinally by hand to suitably press the disk to the ground against the grinding-face of the spring-pressed wheel G.

Mounted upon drive-shaft 17 is a bevel-gear 36, engaging a second bevel-gear 37 on a short shaft 38, angularly mounted on a bearing in part 13 of support F. This shaft 38 is connected by a universal joint 39 to the inclined counter-shaft 40, which passes through bearings in the casting or gear support 41, mounted on the shaft of the revoluble disk-holder I. Between bearings for the counter-shaft 40 in the casting or gear support 41 and keyed to the shaft 40 is the worm-gear 42, so as to be longitudinally movable upon but revoluble with said shaft. The worm-wheel 42 engages the gear 43, keyed to the shaft of the disk-holder, whereby the latter is revolved; but said shaft is longitudinally movable through said gear 43. It will be seen that the flexible universal connection between the drive-shaft and the shaft of the disk-holder permits the longitudinal adjustment of the frame H in order to accommodate disks of varying sizes. In order to permit the angular adjustment of the supports F and H to properly present the disks to the grinding-wheel, the casting 41 is loosely mounted on the shaft of the disk-holder I, and one of the bearings thereof is in the form of a longitudinal slot 44, (see Fig. 6,) so that the support H may be angularly adjusted relatively to the shaft 40 and to support F.

It is obvious from the foregoing that disks of varying sizes and shapes may be secured to the disk-holder and the parts adjusted and operated to suitably sharpen the edges of such disks. In Fig. 1 I have shown the parts adjusted to grind a dished disk K, such as are used in disk harrows, cultivators, and the like. In Fig. 7 I have shown the parts adjusted to grind a larger plate-disk K', such as are used in stalk-cutters, &c. The parts are preferably adjusted so as to bring the edge of the disk to be ground opposite the center of the wheel G.

In the operation of the device the handles 19 and 18 are so arranged that the parts may be operated with the right hand and the disk pressed against the grinding-wheel with the left. In the operation of the grinding-machine the wheel G will be revolved at a high speed to rapidly grind the edge of the disk, and the disk itself will be slowly and uniformly revolved to present its entire circumference to the grinding-wheel.

It is obvious that the parts of the structure

may be varied by the skill of the mechanic without departure from the essentials of the invention and that feature of the same may be employed without its adoption in its entirety.

What I claim as new, and desire to secure by Letters Patent, is—

1. In a grinding-machine for disks and the like, the combination with a frame, of a grinding-wheel drive-shaft and a revoluble disk-holder mounted on said frame, one of said parts being adjustable in a direction at an angle to said grinding-wheel shaft for accommodating disks of varying sizes, and adjustable geared connections between said shaft and said disk-holder.

2. In a grinding-machine for disks and the like, the combination with a frame, of a grinding-wheel drive-shaft and a revoluble disk-holder mounted on said frame, one of said parts being adjustable in a direction at an angle to said grinding-wheel shaft for accommodating disks of varying sizes, a counter-shaft geared to said grinding-wheel shaft and a gear for revolving said disk-holder, keyed to, but longitudinally movable upon said counter-shaft.

3. In a grinding-machine for disks and the like, the combination with a frame, of a grinding-wheel drive-shaft and a revoluble disk-holder mounted on said frame, one of said parts being longitudinally adjustable in a direction at an angle to said grinding-wheel shaft, one of said parts being rotatably adjustable in a plane at right angles to the grinding-face of said wheel and adjustable, flexible geared connections between said shaft and said revoluble disk-holder.

4. In a grinding-machine for disks and the like, the combination with a frame, of a grinding-wheel shaft and a revoluble disk-holder mounted on said frame, one of said parts being longitudinally adjustable in a direction at an angle to said grinding-wheel shaft for accommodating disks of varying sizes, both of said parts being adjustable in a plane at right angles to the grinding-face of said wheel to accommodate disks of varying pitch and means for rotating said revoluble disk-holder.

5. In a grinding-machine for disks and the like, the combination, with a grinding-wheel and with a drive-shaft therefor, of a revoluble disk-holder, said disk-holder being adjustable longitudinally to and from said grinding-wheel and rotatably adjustable in a plane at right angles to the grinding-face of said wheel, and flexible geared connections between said drive-shaft and said revoluble disk-holder.

6. In a grinding-machine for disks and the like, the combination with a main frame and with a grinding-wheel and drive-shaft therefor mounted on said frame, of a disk-holder support, having a revoluble disk-holder, mounted on said frame so as to be longitudinally adjustable to and from said grinding-wheel and rotatably adjustable in a plane at

right angles to the grinding-face of said wheel, and flexible geared connections between said drive-shaft and said revoluble disk-holder.

7. In a grinding-machine for disks and the like, the combination with a main frame, and with a grinding-wheel, and drive-shaft therefor, mounted on said frame, of a disk-holder support, having a revoluble disk-holder, mounted on said frame, a longitudinal slot in said frame, arc-shaped slots in said disk-holder support, and bolts passing through said slots whereby said disk-holder support is longitudinally and rotatably adjustable, and flexible geared connections between said drive-shaft and said revoluble disk-holder.

8. In a grinding-machine for disks and the like, the combination with a main frame, and with a grinding-wheel and drive-shaft therefor mounted on said frame, of a longitudinally and rotatably adjustable disk-holder support having a revoluble disk-holder, mounted on said frame, a gear-support flexibly mounted on said revoluble disk-holder and having a gear for operating the disk-holder, a counter-shaft, said gear being keyed to, but longitudinally movable upon said counter-shaft, and flexible geared connections between said counter-shaft and said drive-shaft.

9. In a grinding-machine for disks and the like, the combination with a main frame, of a gear-support mounted thereon, a grinding-wheel, and drive-shaft therefor, upon said gear-support, a disk-holder support, having a revoluble disk-holder, also mounted on said frame, means whereby one of said supports is adjustable to and from the other, means whereby each of said supports is rotatably adjustable in a plane at right angles to the grinding-face of said wheel, and flexible geared connections between said drive-shaft and said revoluble disk-holder.

10. In a grinding-machine for disks and the like, the combination with a main frame, of a gear-support mounted thereon, a grinding-wheel and drive-shaft therefor upon said gear-support, a disk-holder support, having a revoluble disk-holder, also mounted on said frame, slot-and-bolt connections between said disk-holder support and said frame, whereby said support is longitudinally adjustable to and from said gear-support and

rotatably adjustable in a plane at right angles to the grinding-face of said wheel, and an axial bolt connection between said gear-support and said frame, whereby said support is rotatably adjustable in a plane at right angles to the grinding-face of said wheel, and flexible geared connections between said drive-shaft and said revoluble disk-holder.

11. In a grinding-machine for disks and the like, the combination with a main frame, of an angularly-disposed gear-support mounted thereon, said gear-support provided with a grinding-wheel and a drive-shaft therefor, a disk-holder support also mounted on said frame, a longitudinal slot in said frame, arc-shaped slots in said support, bolt engaging said slots, whereby said disk-holder support may be longitudinally adjusted to and from said disk-support and rotatably adjusted in a plane at right angles to the grinding-face of said wheel, and means for rotating said revoluble disk-support.

12. In a grinding-machine for disks and the like, the combination with a main frame, and a grinding-wheel and drive-shaft therefor, mounted on said frame, of a disk-holder support mounted on said frame and having a disk-holder revolubly mounted on said support, but longitudinally movable there-through, whereby the disk may be pressed against the grinding-face of said wheel, means for revolving said disk-holder, and means for longitudinally moving the same.

13. In a grinding-machine for disks and the like, the combination with a longitudinally-movable revoluble disk-holder, a longitudinally-movable shaft, a grinding-wheel on said shaft, a spring for pressing said shaft and wheel outwardly against the edge of the disk to be ground, means for longitudinally moving said disk-holder and means for revolving said grinding-wheel shaft and said disk-holder.

In testimony whereof I have signed my name to this specification in the presence of two subscribing witnesses.

ADELBERT R. CLIZBE.

Witnesses:

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E. C. WILLION.