Dec. 27, 1927. 1,654,213

S. EINSTEIN ET AL

STEADY REST MECHANISM FOR GRINDING MACHINES

Filed April 28, 1926 2 Sheets-Sheet 1

Fig. 1

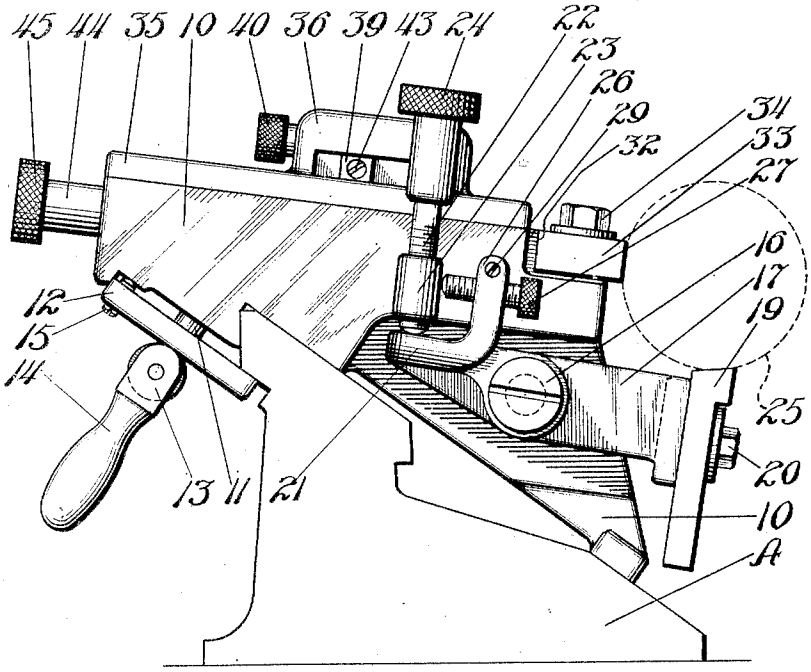
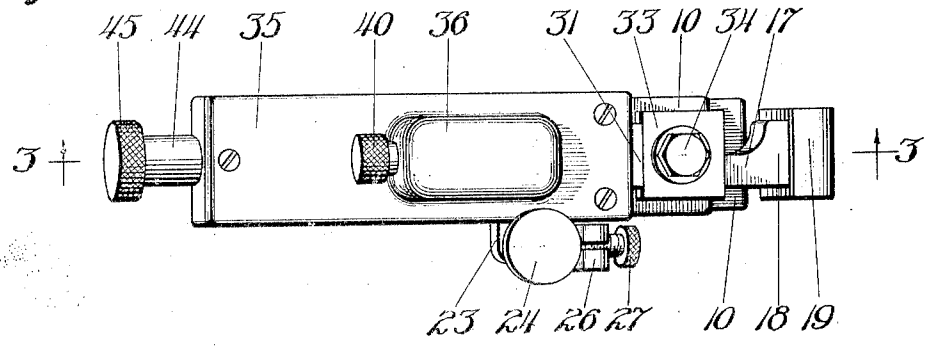


Fig. 2



Inventor
S. Einstein
L. F. Nenninger

By O. K. Parsons
Attorney

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Fig. 3

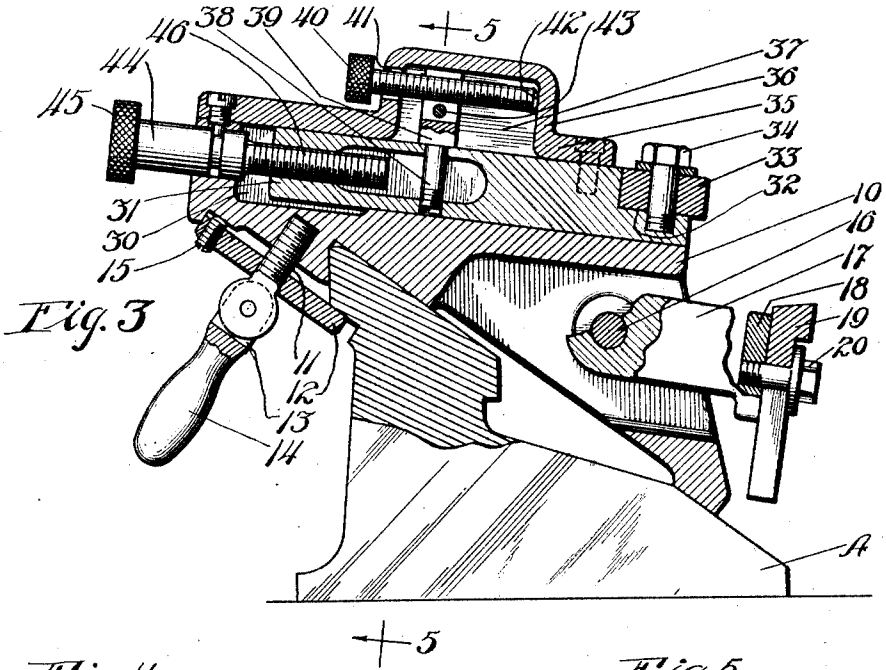


Fig. 4

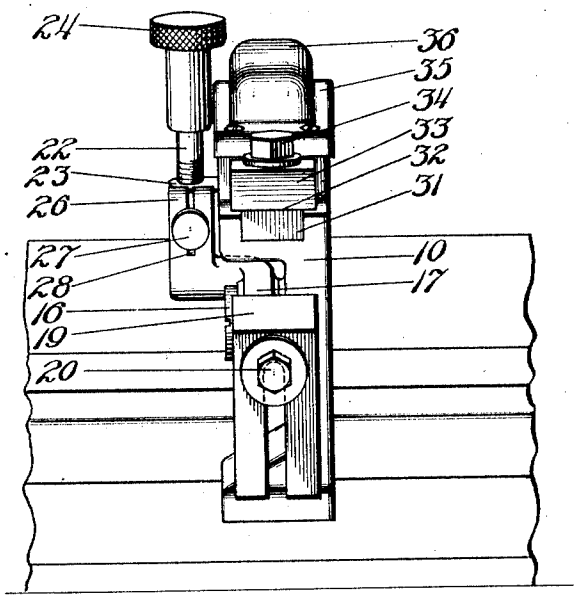
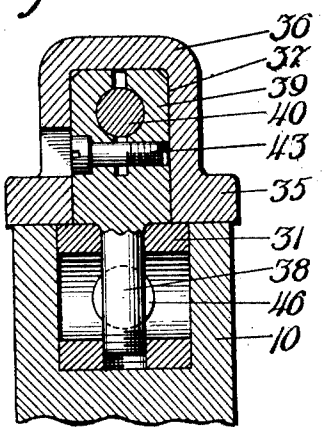


Fig 5



Inventor
S. Einstein
L. F. Nenninger

By O'K Parsons

Attorney

Patented Dec. 27, 1927. 1,654,213

UNITED STATES PATENT OFFICE.

SOL EINSTEIN AND LESTER F. NENNINGER, OF CINCINNATI, OHIO, ASSIGNORS, BY MESNE ASSIGNMENTS, TO CINCINNATI GRINDERS INCORPORATED, OF CINCINNATI, OHIO, A CORPORATION OF OHIO.

STEADY-REST MECHANISM FOR GRINDING MACHINES.

Application filed April 28, 1926. Serial No. 105,257.

This invention relates to improvements in steady rest mechanism for grinding machines.

In the production of cylindrical articles in center grinding machines, it is necessary that there be a relative feeding movement between the work and the grinding wheel operating upon the work. This feeding movement results in a pressure of the wheel against the work, which in the case of long work-pieces tends to centrally spring the work, so that the reduction at the central part is less than that at the more rigidly held end portions thereof.

To overcome this difficulty use is made of means for backing up the work to prevent such springing action. As the work is reduced it is necessary that these backing up members be suitably shifted toward the work to compensate for the amount of material which has been removed therefrom.

It is therefore the purpose of the present invention to provide a novel and improved structure of steady rest which may be quickly and easily placed in desired position on the grinding machine table, which shall possess a plurality of parts for independent engagement with the work-piece at different points around the periphery thereof, which work-engaging members shall be capable of ready adjustment to maintain proper contact.

A further object of the invention is the provision of novel and improved means for limiting the movement of said steadying devices against the work, which shall be independent of the adjusting mechanisms and shall thus facilitate repeated adjustments of the units of the steady rest to a given position, according to the final size of the work, and without interference with the other adjusting movements of the parts.

With these objects in view, the invention consists in the novel construction and arrangement of parts, substantially as hereinafter described and disclosed in the accompanying drawings and it will be understood that any modifications in the specific structural details within the scope of the appended claims may be made, without departing from or exceeding the spirit of the invention.

Figure 1 represents a side elevation of the device in use.

Figure 2 represents a plan view thereof.

Figure 3 is a longitudinal sectional view as on the line 3—3 of Figure 2, and

Figure 4 is an end view thereof.

Figure 5 is a vertical sectional view as on the line 5—5 of Figure 3.

In the drawings the letter A designates the table of a conventional center grinding machine on which is mounted the main casting or base 10 of the improved steady rest. The base 10 has a portion interlocking with the table A, and in addition is provided with the screw 11 on which is mounted plate 12, the screw exteriorly being flattened and having pivoted thereto the furcations of the cam head 13 of clamp lever 14. This lever is adapted to bear against the plate 12, pressing one side of it against the underside of the table and the other side against the base 10. It will be understood that coarse adjustment of the position of the clamp lever may be made by rotation of screw 11, while for finer adjustments, and in order that the lever 14 may be at all times most accessibly located, plate 12 is provided with the adjustable abutment screw 15 to adjustably contact with the underside of base 10 and form a fulcrum on which the clamp plate 12 may rock. Carried by the base 10 is a pivot screw 16 for the lower steady rest arm 17, having a head 18 to which is adjustably secured the steady rest shoe 19 as by clamp bolt 20. The arm 17 has a rearward extension 21, adapted to be engaged by a lower end of adjusting screw 22 carried by lug 23 on base 10, and having a knurled head 24. Downward screwing of member 22 will cause its end to bear against an extension 21 of arm 17, rocking this arm to shift shoe 19 upwardly against the work-piece 25. It will be understood that during grinding there are two directions of force exerted against the work which must be given consideration. One is the lateral thrust occasioned by the feeding movement of the grinding wheel and the second is the downward thrust of the cutting force of the grinding wheel. Shoe 19 is intended to take up this downward thrust and prevent a springing of the work, on account of this force component of the grinding wheel. It will be appreciated however, that while it is undesirable to allow the work to spring downwardly from the force of the grind-

ing wheel, it is equally undesirable to have the work bent upward from its axis by undue pressure or adjustment of the steady rest shoe. To prevent this, extension 21 has an upwardly projecting arm 26 bearing the stop screw 27, designed to contact with lug 23 on base 10, to limit possible swinging movement of arm 17 about its pivot 16. To facilitate accurate setting of this stop screw for the final or maximum adjustment to be given the contact shoe when the work is down to size, arm 26 is preferably split as at 28 and a lock screw 29 employed, connecting the furcations formed by the split, whereby tightening of this screw will serve to lock the stop screw 27 in its desired adjusted position.

As has been mentioned, it is necessary to support the work not only against a downward pressure but against an outward pressure occasioned by the relative feed of work, and grinding wheel. This is accomplished by forming in the base 10 a slideway 30 for the sliding block 31 which projects forwardly of the upper portion of the base and has a seat or recess 32 to receive the lateral steady rest shoe 33 retained in position on the seat by clamp screw 34.

A cover plate 35 serves as a closure for the slideway 30 and has an upstanding bracket portion 36 overlying a slot 37. A stud 38 has a squared head 39 extending upward through slot 37 and into the space enclosed by the bracket. This stud is preferably split or furcated and is also tapped to receive the stop screw 40, which is slidable in a passage 41 at the rear of the bracket, but is adapted to contact with the abutment wall 42 of the front of the bracket. A lock screw 43 serves to secure the screw 40 against accidental rotation or adjustment with respect to head 39.

In use the stop screw 40 is so set that it will just contact with wall 42 and limit forward movement of slide 31 when the steady rest shoe 33 is in position to properly engage the periphery of a finished work-piece. On the other hand, when the slide is withdrawn for removal of the work and insertion of a new work-piece or the like, the screw moves as a unit with head 39 and freely through passage 41 in bracket 36, and nowise interferes with withdrawing movement or with actuation of the slide 31 prior to its movement into final operative position.

To accomplish this movement of the slide there is swivelled in the rear of base 10 in alinement with the slideway 30, the adjusting member 44, having a knurled head 45 and having a threaded portion 46 engaged in a threaded socket in slide 31. Rotation of member 44 will impart an in and out movement to the slide, holding shoe 33 up against the work as desired, while stop screw 40 moving with the slide will, at an appropriate time, contact with abutment wall 41 and thus positively limit the movement of the slide in the direction of the grinding wheel.

From the foregoing it will be noted that there has been provided an extremely simple and efficient mechanism in which a unitary steady rest member may have its base readily positioned on the grinding machine table and quickly locked in adjusted position by suitable movement of the clamp lever 14 and in which the pair of contact shoes shown may each be individually adjusted to properly engage the work-piece during its reduction, in which the adjusting devices for the contact shoes are entirely free, clear and accessible, but in which readily adjustable, but positively lockable means are provided for definitely limiting the adjustment of the contact shoes in the direction of the work.

Attention is also invited to the fact that the two contact shoes are disposed in alinement, one with the other, the lateral shoe being given its adjustment by movement of its slide, while the shoe engaging the underside of the work is not only capable of adjustment by rocking of its supporting arm 17, but in addition, is slotted so that it may be given a vertical adjustment with respect to said supporting arm 17.

It will also be noted that while the shoes are in alinement, the adjusting mechanism for the lower shoe is laterally offset with respect to the body of the base, where it will in nowise interfere with the action of the transverse slide 31, but will be readily accessible for actuation.

We claim:—

1. A steady rest for grinding machines, including a base portion, a pair of contact shoes, shiftable supports for said contact shoes, means for shifting the supports to adjust the position of the contact shoes, and stop devices carried by the shoe supports for engagement with abutments on the bed to limit the movement of the supports.

2. A steady rest for grinding machines, including a base portion, a pair of contact shoes, shiftable supports for said contact shoes, means for shifting the supports to adjust the position of the contact shoes, and stop devices carried by the shoe supports for engagement with abutments on the bed to limit the movement of the support, said stop devices being located at points remote from the adjusting means for the supports.

3. A steady rest comprising a base having a horizontal slideway, a slide movable in the slideway, a contact shoe carried by the slide, a screw adjusting member swivelled to the base and in threaded engagement with the slide for adjustment thereof, a lug projecting from the slide, a stop screw adjustably supported in said lug and an abutment member on the base projecting into the path of

movement of the stop screw whereby shifting of the slide in one direction will be limited by interengagement of the stop and abutment.

4. A steady rest construction including a base, a pivot carried by the base, an arm oscillatable about the pivot, a contact shoe adjustably carried by said arm, and a pair of angularly related extensions on the arm at the opposite side of the pivot from the screw, adjusting means on the bed engaging one of said extensions for rocking the arm about its pivot, and stop means on the other of said extensions adapted to engage the bed to limit the rocking movement of the arm.

5. A steady rest for grinding machines, including a base portion for application to the table of the grinder, said portion having a slideway formed therein, a slide movable in the slideway, a contact shoe carried by the slide, an adjusting member swivelled to the base adjacent the slideway and having threaded engagement with the slide for adjustment thereof, a cover plate for the slideway having a slot formed therein and a bracket portion overlying the slot, a stud carried by the slide and movable in the slot, and an adjustable stop device carried by the stud and having a portion for engagement with the bracket to limit the movement of the slide in one direction.

In testimony whereof we affix our signatures.

SOL EINSTEIN.
LESTER F. NENNINGER.