

April 3, 1928.

1,664,823

C. KNOWLES

SIZE INDICATOR FOR SURFACE GRINDERS

Filed Feb. 19, 1923

Fig. 1.

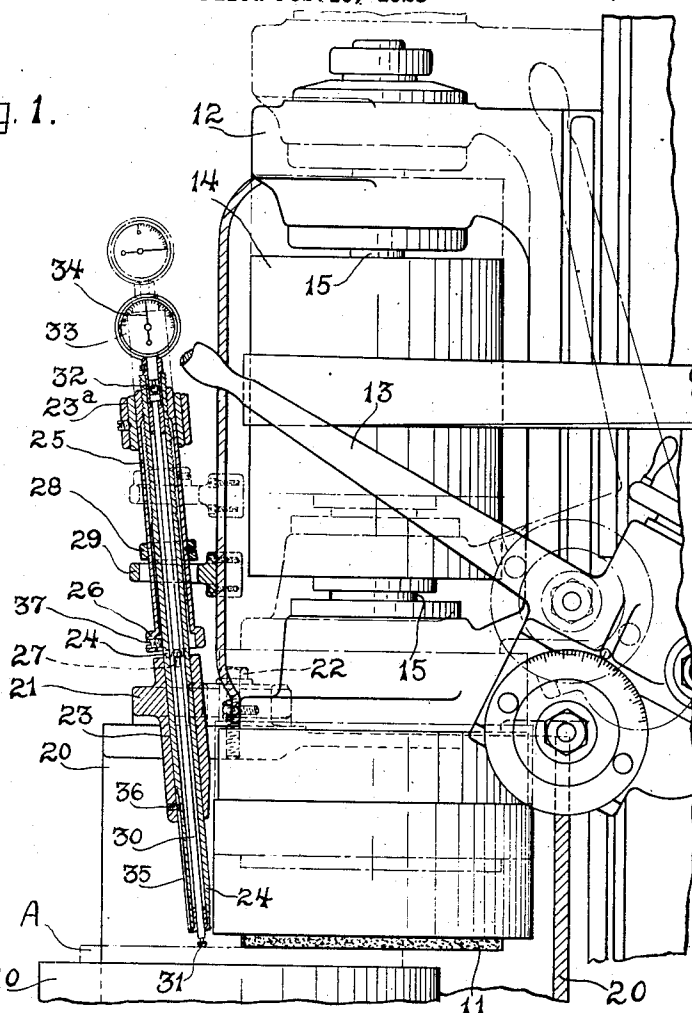


Fig. 4.

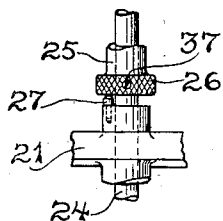


Fig. 2.

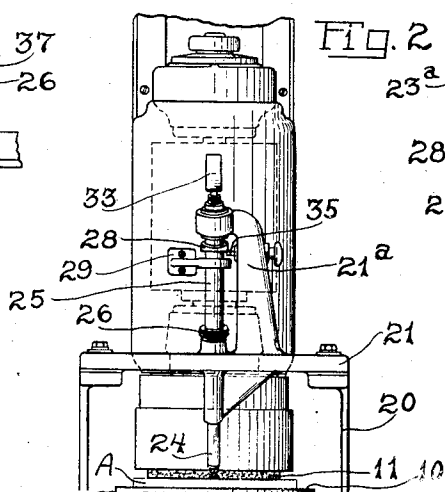
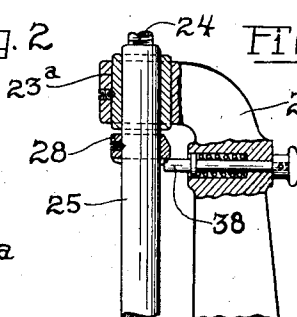


Fig. 3.



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UNITED STATES PATENT OFFICE.

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SIZE INDICATOR FOR SURFACE GRINDERS.

Application filed February 19, 1923. Serial No. 620,022.

This invention relates to an indicator adapted to be applied to and used in connection with a surface grinder to indicate when the work being operated on has been brought down to its final dimension.

More particularly this invention relates to an indicator adapted to be directly mounted on a fixed part of the machine and adapted to be moved to its operative and inoperative positions by movement of one of the elements of the grinding machine.

A principal object of the present invention is to provide an improved form of size indicator adapted to contact with the work and indicate the progress of the grinding operation. It is also an object of the invention to provide means for supporting and guiding the indicator so that it may be automatically moved into and out of operative position simultaneously with the normal movements of the wheel head, or other movable part of the grinder during operation of the grinder.

Another object of the invention is to provide a form of indicator which will automatically reset itself to precisely the proper position each time the movable part of the grinder is brought to its operative position so that a large number of identical parts may be ground and the indicator used thereon without necessitating individual preliminary adjustments.

Another feature which is advantageous is that means are provided whereby adjustments of the indicator may be readily made to adapt it for operating upon different thicknesses of work.

The invention shown and described herein is adapted particularly for use in association with the form of surface grinder disclosed and claimed in my Patent No. 1,458,623 granted me June 12, 1923.

With these and other objects in view, my invention consists in the features of construction and operation set forth in the following specification and illustrated in the accompanying drawing.

In the accompanying drawing annexed hereto and forming a part of this specification, I have shown my invention embodied in a vertical surface grinding machine but it will be understood that the invention can be otherwise embodied and that the drawing is not to be construed as defining or limiting the scope of the invention, the

claims appended to this specification being relied upon for that purpose.

In the drawing:

Figure 1 is a side elevation of a portion of a surface grinder having the present invention applied thereto.

Fig. 2 is a front elevation on a smaller scale of the indicator and its supporting means.

Fig. 3 is a detail view of a part of the invention.

Fig. 4 is a fragmentary view of the connection between the support and the indicator.

In the above mentioned drawing, I have shown but one embodiment of the invention which is now deemed preferable but it is to be understood that changes and modifications may be made within the scope of the appended claims without departing from the spirit of the invention.

Briefly, my invention in its broadest aspect comprises the following principal parts: First, a surface grinder of conventional form having a work supporting table on which work may be mounted and suitably held in fixed position; second, an abrasive wheel rotatably mounted and preferably movable toward and from the surface of the work supporting table; third, means to raise and lower the wheel head and wheel out of and into its operative position; fourth, a fixed support in which the body member of the indicator is slidably mounted; fifth, an indicator having an elongated member adapted at its lower end to contact with work mounted on the table and at its upper end to be associated with a dial indicator; and sixth, means on the movable element of the grinder to move the indicator out of its operative position each time the wheel is raised from the table and permit it to move back to its predetermined operative position when the wheel head is again moved toward the work.

Referring more in detail to the figures of the drawing, the operative parts of a surface grinder of a typical or conventional form are shown, a rotating work supporting table being indicated at 10. Adjacent thereto is rotatably mounted an abrasive wheel 11. This wheel 11 is preferably mounted in a vertically movable wheel head 12, the position of which can be varied by oscillation of the hand lever 13 as shown. The pulley 14

mounted on the spindle 15 carrying the abrasive wheel 11 provides means for rotating the wheel. As the above parts are the well known parts of a conventional form of grinder, a further description of them will be unnecessary.

Preferably surrounding the work supporting table 10 and the wheel 11 is a guard member 20. This is in the form of a vertical semi-cylindrical wall enclosing the rear portions of the table 10 and the abrasive wheel 11. On the upper portion of this guard 20 is mounted a support 21 which may be rigidly held thereon by suitable clamping bolts 22. As shown this support 21 is provided with an inclined opening 23 extending completely therethrough and through which extends the body member 24 of the indicator forming the present invention.

The support 21 is preferably provided with an upwardly extending arm 21^a having an opening 23^a in alignment with opening 23. By means of this arm 21^a and its opening 23^a the body member 24 of the indicator is adapted to be supported at two widely different points. The body member 24 of the indicator is preferably adjustably mounted within a sleeve 25, the lower end of which is provided with a flange 26 and which in its operative or lower position is adapted to contact with a button 27 attached to the support 21 previously referred to. Also on this sleeve member 25 is a suitable collar 28, and just below the collar 28 is a yoke member 29 fixed to and outstanding from a portion of the wheel head 12. This yoke member 29 is adapted when the wheel head is moved vertically upward, to contact with the collar 28 and thus raise the body member 24 and sleeve 25 together with their attached parts out of their operative position.

Within the body member 24 of the indicator is slidably mounted an elongated rod 30, the lower end of which is provided with a contact member 31 adapted to rest upon work A mounted on the work supporting table 10. The opposite end of the rod 30 is adapted to contact with the spindle 32 of a dial indicator 33. It will be seen from the above that with the body member 24 mounted within and slidable up and down in the support 21 and with the sleeve 25 in contact with the button 27, the device will be in operative position. Also with the contact 31 on the rod 30 in engagement with the work, the position of the pointer 34 on the dial indicator 33 will indicate exactly the comparative thickness of the work pieces A. Continued operation of the wheel 11 and its abrasive action on the work A will be indicated by movement of the pointer 34 on the dial indicator 33.

Preferably the adjustment between the body member 24 and the sleeve 25 comprises interengaging threaded portions. By ro-

tation of the sleeve 25, relative to the body member 24, the vertical position of the body member 24 and the parts contained therein may be widely varied for different thicknesses of work being ground. Also this rotation of the sleeve 25 permits adjustment of the device for varying thicknesses of work without necessitating changing the position of the support 21 and its contact member 27.

At its lower end the body member 24 is provided with a longitudinal groove 35 and on the support 21 is a screw 36 adapted to engage it so that no rotation of the body member 24 can take place. Also a screw 37 may be provided in the sleeve 25 so that when adjusted the sleeve 25 may be locked in position.

During the use of the indicator on a plurality of pieces of identical final thickness no adjustments whatever are required. It is only when the character of work being ground is changed that the axial position of the member 24 relative to the sleeve 25 is required to be adjusted.

In operating upon certain types of work pieces on the table 10 it may be impossible to allow the contact 31 to continuously rest on the work. I therefore provide a resiliently mounted detent 38 within the extension 21^a of the support 21 and adapted to engage the lower surface of the collar 28 to hold the body member 24 and its attached parts in their inoperative position.

In the use of this invention, it is desirable to first quickly set the indicator device precisely in its predetermined position for a number of identical pieces, the indicator not thereafter requiring adjustments until the dimensions of the work being operated upon are changed. For this purpose, the indicator preferably may be adjusted by means of gage blocks of the thickness desired being placed upon the table 10 in contact with the contact member 31 on the indicator rod 30 and the position of the pointer of the dial indicator brought to a zero mark by rotation of the sleeve 25 or adjustments within the indicator 33 itself. With this preliminary adjustment given the indicator, it is only necessary to raise and lower the wheel head 12 as required in the normal or usual operation of the machine to move the indicator into and out of its operative position. Also each downward movement of the wheel head 12 will permit the body member 24 and sleeve 25 to move downward to an exact predetermined position determined by the button 27 and the adjustment of the body member 24.

It will also be seen that with each upward movement of the hand lever 13 to enable work A to be changed on the supporting table 10, the indicator is also elevated so as to be entirely removed from its operative position. This takes place by reason of the engagement of the collar 28 by the yoke 29.

Downward movement of the hand lever 13, however, permits advancement of the body member 24 into operative position until the contact button 27 on the support 21 engages the lower surface of the sleeve 25. Continued oscillation of the lever during the grinding operation causes the rod 30 within the body member 24 to move relative to this member 24 thus showing the progress of the grinding operation by oscillation of the pointer 34 on the dial indicator 33.

What I claim is:

1. An indicator device for surface grinders comprising in combination, a fixed support, an indicator movably mounted on the support, means to remove the indicator from its operative position and return it to its operative position, said means being operated by movement of the wheel toward and from the work supporting table of the grinder.

2. An indicator device for surface grinders comprising in combination, a fixed support therefor provided on said grinder, a body member slidable relative to said support, means to limit the movement of the body member in one direction, a rod slidable within the body member adapted to be axially moved during operation as the work is being ground, said movement being adapted to influence an indicator, and means to move the body member to inoperative position with movements of the wheel head.

3. An indicator device for surface grinders comprising in combination, a support fixed relative to the work supporting table of the grinder, a body member slidable relative to said support, means to limit the movement of the body member in one direction, a rod slidable within the body member adapted at one end to engage the work being ground and at its opposite end to contact with an indicator, and a detent adapted to support the body member in inoperative position during operation of the grinder.

4. An indicator device for surface grinders comprising in combination, a support fixed relative to the work supporting table of the grinder, a body member slidable relative to said support, means to limit the movement of the body member while in operative position, and means to move the

body member to an inoperative position with movement of the wheel head out of operative position.

5. An indicator device for surface grinders comprising in combination, a support fixed relative to the work supporting table of the grinder, a body member slidable relative to said support, means to limit the movement of the body member while in operative position, and means to move the body member into and out of operative position with corresponding movements of the wheel head.

6. An indicator device for surface grinders comprising in combination, a support fixed relative to the work supporting table of the grinder, a body member slidable relative to said support, means to limit the movement of the body member while in operative position, means to move the body member to an inoperative position with movement of the wheel head out of operative position, and means on the support adapted to retain the body member in inoperative position.

7. An indicator device for surface grinders comprising in combination, a fixed support therefor on the grinder, a body member slidable within the support, a sleeve surrounding the body member and adjustably connected thereto, a contact member on the support adapted to engage the sleeve to control the operative position of the body member and sleeve, and means to remove the body member from operative position with movements of the operative parts of the grinder.

8. An indicator device for surface grinders comprising in combination, a fixed support therefor on the grinder, a body member slidable within the support, a sleeve surrounding the body member and threaded thereto whereby the body member and sleeve are axially adjustable, a contact member on the support adapted to engage the sleeve to control the operative position of the body member and sleeve, and means to remove the body member and sleeve from operative position with movements of the operative parts of the grinder.

In testimony whereof, I hereunto affix my signature.

CARROLL KNOWLES.