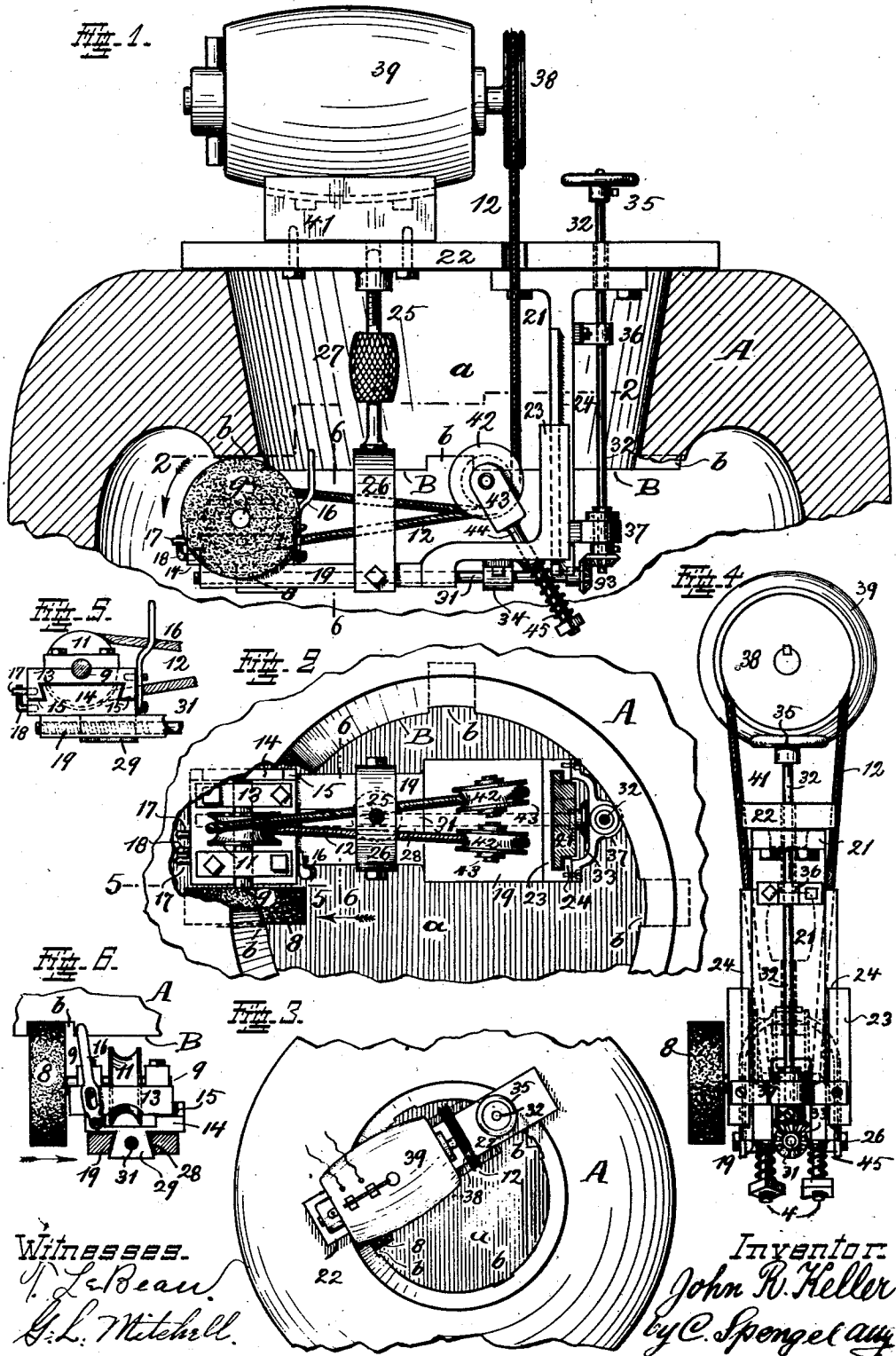


J. R. KELLER.
 INTERIOR GRINDING DEVICE.
 APPLICATION FILED APR. 1, 1909.

938,387.

Patented Oct. 26, 1909.



Witnesses.
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UNITED STATES PATENT OFFICE.

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INTERIOR GRINDING DEVICE.

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To all whom it may concern:

Be it known that I, JOHN R. KELLER, a citizen of the United States, and a resident of Cincinnati, Hamilton county, State of Ohio, have invented a certain new and useful Interior Grinding Device which is Portable; and I do declare the following to be a clear, full, and exact description thereof, attention being called to the accompanying drawing, with the reference characters marked thereon, which forms also a part of this specification.

This invention relates to a grinding device constructed to permit its use under certain conditions when other means or devices cannot be readily applied.

The device is more particularly designed for use on interior surfaces of safe-bodies and on the underside of parts thereof which are not readily accessible to permit use of other tools, and where operation by grinding is also preferable by reason of the character of the metal and the kind of work to be done.

The invention is described and illustrated in connection with a cast-metal safe-body, on the inside of which certain work has to be done, as for instance finishing of the inner edge around the door-opening, cutting of key-ways, cleaning out of recesses intended to receive the locking-bolts etc.

In the following specification and particularly pointed out in the claims at the end thereof, will be found a full description of my invention, together with its operation, parts and construction, which latter is also illustrated in the accompanying drawing, in which:—

Figure 1, shows my device in side-elevation and in position on a safe-body on which it is used to grind out recesses which are provided therein, to receive the ends of locking-bolts carried by the door for this body and serving to hold it in closed position. The safe-body as much of it as is shown, appears in vertical cross-section, the line of section passing through the opening therein which is provided to receive the door above referred to. Fig. 2, shows that part of the wall of the safe-body, illustrated in Fig. 1, which contains the door-opening. It also shows in top-view the lower part of my grinding-device which is used inside of this safe-body, the device being substantially

shown on a horizontal section taken on line 55 2—2 of Fig. 1, a portion of the safe-wall at the edge of the door-opening being broken out to uncover that part of the grinding-device otherwise hidden thereby. Fig. 3, shows in a similar view, and at reduced 60 scale, the larger part of the safe as it appears above, with my grinding-device superposed in position and shown in top-view. Fig. 4, is an end-view of the device, showing its right end as it appears in Fig. 1. Fig. 5, 65 is a transverse section on line 5—5 of Fig. 2. Fig. 6, is a vertical section on line 6—6 of Fig. 1, looking toward the left, observe this line also in Fig. 2.

A indicates the front-wall of a safe-body 70 which may be an integral casting, and *a* is the door-opening therein. The door fitted to this opening, to close the same is not shown. Bolts are carried by such a door to hold the same in closed position, the ends of 75 said bolts being received in recesses *b*, provided on the inner side B of the front-wall. These recesses open into the door-opening, so that the bolts carried on the side of the door, when moving outwardly therefrom, 80 may enter these recesses. These latter may be cored out in the rough casting, in which case they are merely cleaned out and finished to proper dimensions, or they may be cut into the solid metal. To do either work I 85 use a grinding-wheel 8, which may be a customary emery-wheel and is mounted upon a shaft 9. 11 is a belt-pulley mounted also upon this shaft, and 12 is a belt whereby this pulley is driven. The bearings for 90 shaft 9 are provided on a slide 13 which is fitted to a carriage 14 in a manner to permit lateral movement thereon, that is axially with reference to the grinding-wheel. Complementary, dove-tailed guide-ways 15, 15, 95 are provided for this movement. A handle 16 pivoted to the carriage and engaging the slide is provided for this movement. Sufficient of the upper part of the carriage is removed, if necessary, to clear the pulley 100 during this lateral adjustment, the same being done with reference to the slide to clear the belt, all as best shown in Fig. 6. Projections to form stops which limit the movement of the slide on the carriage are 105 provided, there being two of them on one and one, which co-acts with them, on the other, they preventing also the belt-pulley

from rubbing against the opposite ends of the recess in the carriage in which the pulley rotates. Two pins 17 are shown for such purpose on slide 13, which co-act with another pin 18 on carriage 14 for this purpose.

Carriage 14 is supported by an arm 19, projecting from a hanger 21 which depends from the underside of a bed-plate 22 which serves to support the device in position on the safe, this latter being so placed at the time and as shown in Fig. 3, as to bring its door-opening uppermost. The bed-plate bridges this opening, resting upon the wall and on opposite portions of its edge which surrounds the door-opening, while the grinding-device proper depends into this opening. Arm 19 is vertically adjustable, to permit the grinding-wheel to be adjusted to the proper position with reference to the inner side B of wall A, under which it has to move, and also with reference to the depth of recesses *b* which are to be cut thereinto. For such purpose arm 19 is provided with or forms part of a slide 23 which is fitted to hanger 21, both being provided with complementary guide-ways 24, for the purpose. A brace which serves to steady arm 19 near its free end, by connecting it to the bed-plate, serves also as a means to move the same for this adjustment. For such purpose this brace consists of a rod 25 and of a stirrup 26, the former at its upper end connected to the underside of the bed-plate and the latter to arm 19. They are also connected to each other in a manner which permits rod 25 at its lower end to turn freely in the stirrup. Its upper end is screw-threaded and tapped into the bed-plate from below. A knob 27 is provided on it to facilitate such turning. If this is done, the upper end of the rod screws in or out of the bed-plate according to the direction of its rotation, and accordingly raises or lowers arm 19 which carries the grinding-wheel. After the position of the grinding-wheel has thus been adjusted vertically by these means, it is also adjusted laterally to the proper position by means of manipulation of handle 16, the grinding-wheel by means of its slide being shifted on the carriage. The grinding-wheel is now ready to be fed forward into the work, that is to cut into the underside of wall A, this movement being one lengthwise with reference to the recess to be formed, see arrow in Fig. 2. For such purpose carriage 14 with slide 13, which carries the grinding-wheel, is fitted to arm 19 in a manner to permit such movement. It is done here by providing a guide-way 28 in arm 19 to which a projecting part 29 on the underside of carriage 14 is fitted as best shown in Fig. 6. Suitable means are provided accessible for manipulation from above whereby the carriage may be moved accordingly. They consist of two

angularly disposed shafts 31, 32, operatively connected for simultaneous rotation by a set of bevel-wheels 33. The lower shaft 31 is supported on arm 19, so as to move with it, a bearing 34 being provided for it near its gear-connected end. Its other end is screw-threaded and tapped into projection 29 on the underside of the carriage, this projection forming a nut for the purpose. The other shaft 32 is arranged to extend upwardly through the bed-plate and is provided at its upper end with a suitable handle or hand-wheel 35 for its rotation. It may find an upper bearing in the bed-plate, if closely fitted thereto, or an independent bearing may be provided as shown at 36. Its lower end finds a bearing in the gear-wheel carried on it, which gear-wheel is supported in a bearing 37. This bearing is attached to slide 23 of arm 19, so that during the vertical adjustment of this arm, the gear-wheels remain in mesh.

Pulley 11 on the grinding-shaft is driven by another pulley 38 which may be mounted on a line or counter-shaft, or driven by the shaft of an electrical motor. A preferable arrangement is shown in which a motor 39 is supported on bed-plate 22. A saddle 41 is interposed to which the motor housing is fitted and connected. In order to interfere as little as possible with the observation of the work and with access to handle 16, it is preferable to mount this motor lengthwise with reference to the bed-plate as shown in Fig. 3. This necessitates the use of guide-pulleys 42 to properly direct belt 12, stretched between pulleys 11 and 38. These guide-pulleys are yieldingly supported so as to maintain a proper belt-tension during the various changes in position which belt-pulley 11 assumes when the position of the grinding-wheel is adjusted. A preferable way is shown by providing the bearings 43 for these guide-pulleys with shanks 44 yieldingly held in position by springs 45 sleeved upon these shanks.

To permit the device to pass through the door-opening of the safe, it is preferable to run the grinding-wheel and its carriage as far toward the hanger as possible. The device in a tilted position and with the free end of arm 19 in advance is passed in around the inner edge of the safe-wall, and under the same. After this edge is passed, the device is righted and the bed-plate is positioned upon the wall which surrounds the door-opening; as shown in Fig. 3, the safe-body being accordingly supported to bring its door-opening uppermost.

The grinding-wheel is adjusted vertically according to the depth of recess *b*, to be cut by manipulation of knob 27. It is adjusted laterally to suit the width of the recess by means of handle 16. The feed-motion forward and return is obtained by manipulat-

ing handle 35. After a recess is cut, the device is shifted around on the safe-wall to proper position for cutting another recess.

When the driving-pulley 38 is mounted on a shaft which is fixedly located, shifting of the safe-body, to meet these various positions, would become necessary.

After all the recesses have been cut on the underside of wall A, the device is withdrawn in a similar manner and is ready to be applied to another safe.

Having described my invention, I claim as new:

1. In a grinding-device, the combination of a hanger, an arm projecting therefrom, a grinding-wheel, a shaft on which the same is mounted, means at the free end of the arm whereby the shaft is supported in a manner permitting adjustment of it in the direction of its axis and at right angles thereto, manipulating devices to move these means and means provided above the arm to rotate this shaft.

2. In combination, a grinding-wheel, a shaft for it, a slide on which this shaft is mounted, a carriage to which this slide is fitted in a manner to permit its adjustment in a direction parallel to the shaft, an arm on which the carriage is supported and which is provided with guide-ways to which the carriage is fitted in a manner to permit its adjustment in a direction at right angles to the shaft of the grinding wheel, said arm be-

ing also provided with a slide, a hanger to which this slide is fitted and whereby the arm is adjustably connected to said hanger, a bed-plate from which the hanger depends and means above the bed-plate to actuate the grinding-wheel.

3. In a grinding-device, the combination of a bed-plate, a hanger depending therefrom, an arm movably secured at one of its ends to this hanger, a grinding-wheel, an adjustable support provided for it at the other end of the arm, operatively connected, angularly arranged shafts, one of which connects also to the grinding-wheel-support and means accessible above the bed-plate to manipulate these shafts for moving the grinding-wheel-support.

4. In a grinding-device, the combination of a frame comprising a bed-plate, a hanger depending therefrom and an arm carried by this hanger, an adjustable grinding-wheel supported on this arm, a shaft for it, a pulley on this shaft, a motor supported on the bed-plate, a pulley driven by it, a belt connecting it with the other pulley and guide-pulleys for the belt yieldingly supported on the frame.

In testimony whereof, I hereunto affix my signature in the presence of two witnesses.

JOHN R. KELLER.

Witnesses:

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C. SPENGEL.