

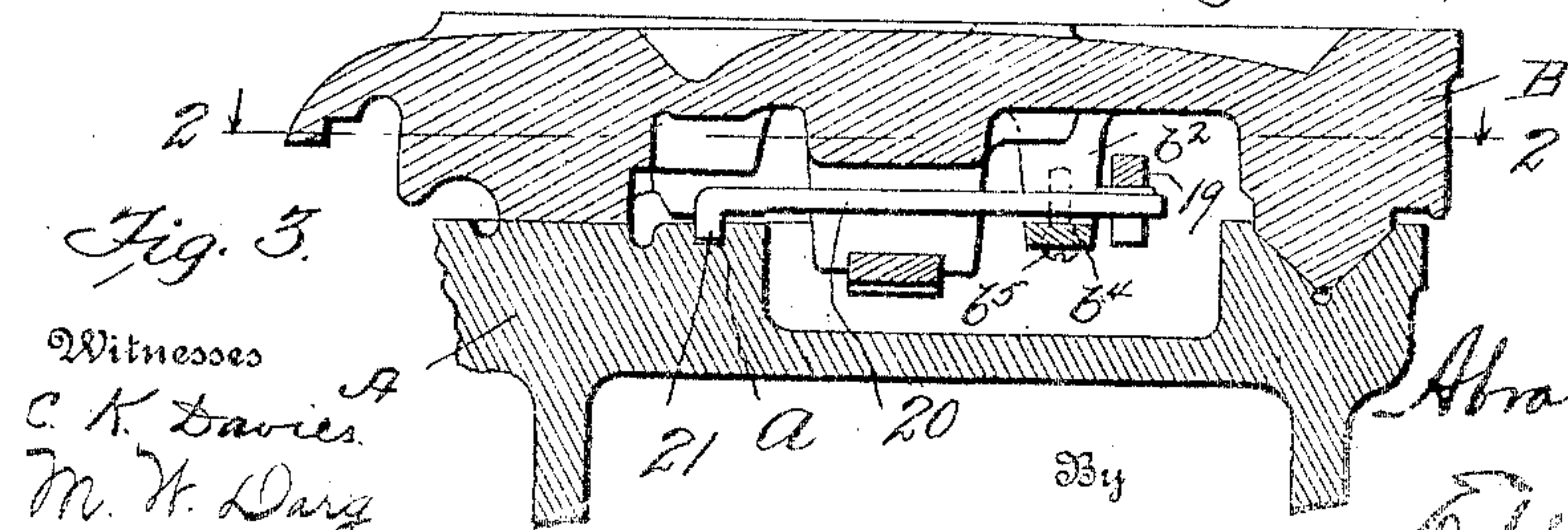
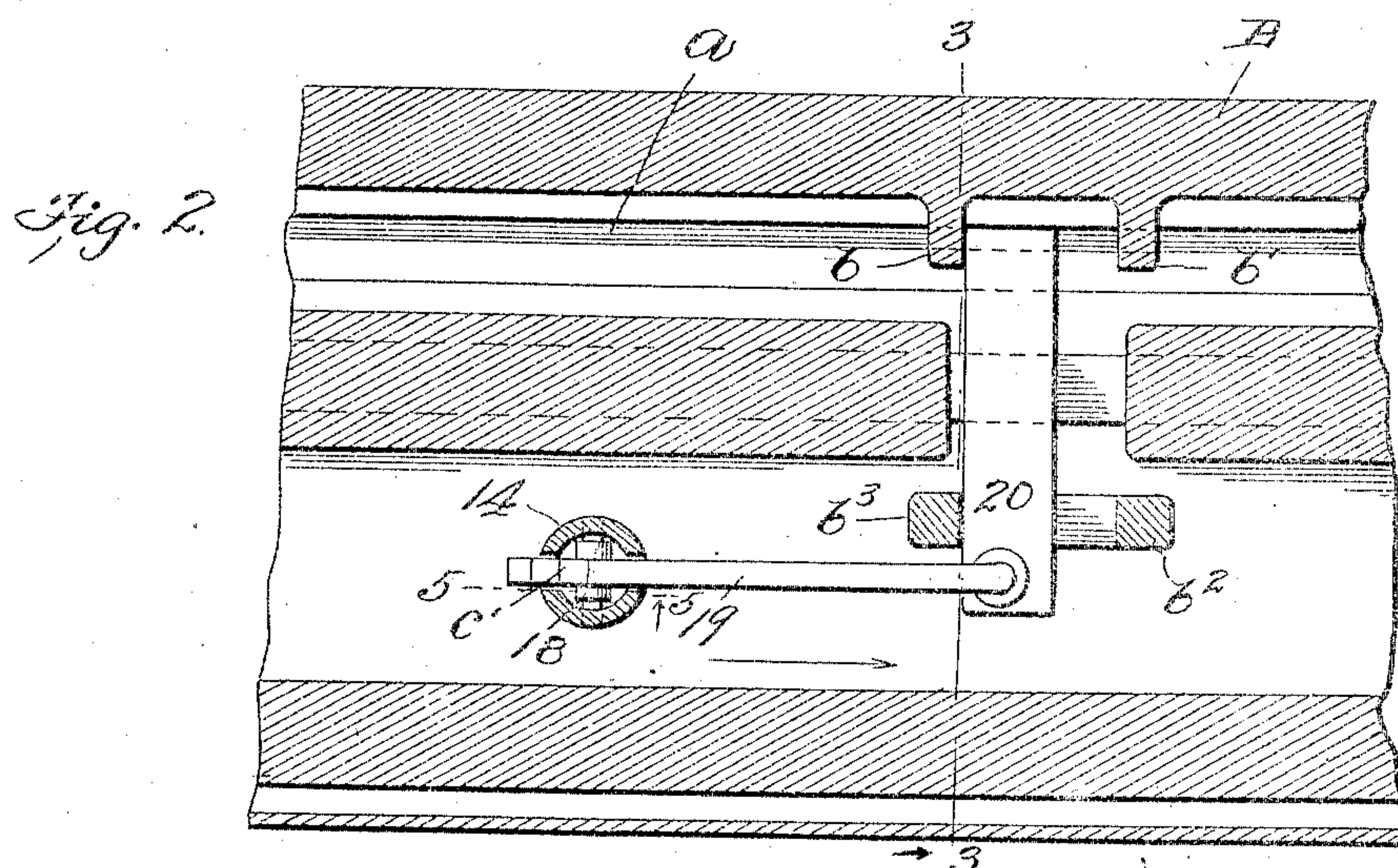
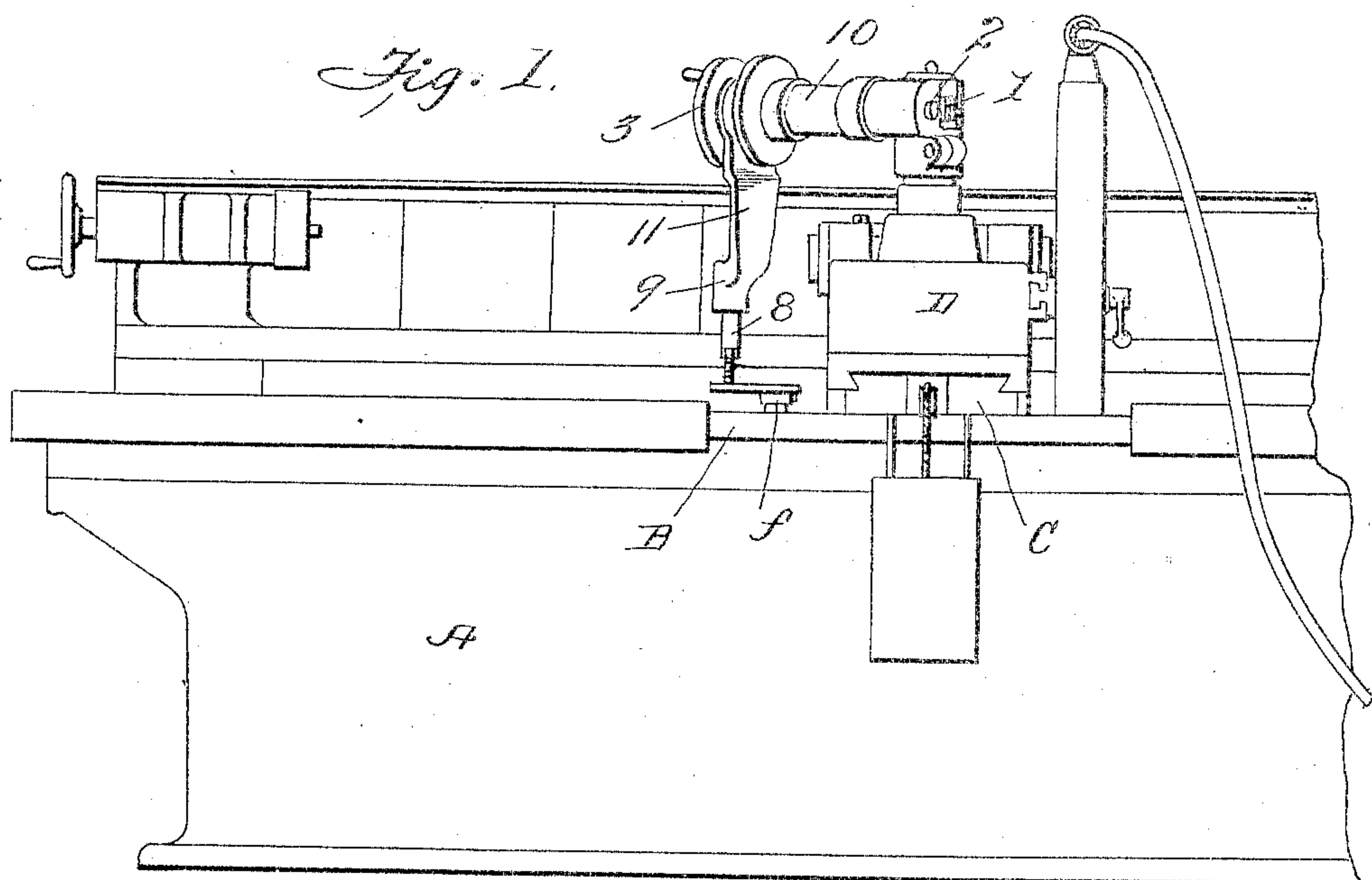
No. 879,276.

A. B. LANDIS.
GRINDING MACHINE.

APPLICATION FILED DEC. 1, 1906.

PATENTED FEB. 18, 1908.

2 SHEETS—SHEET 1.



Witnesses
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M. H. Darg.

Inventor

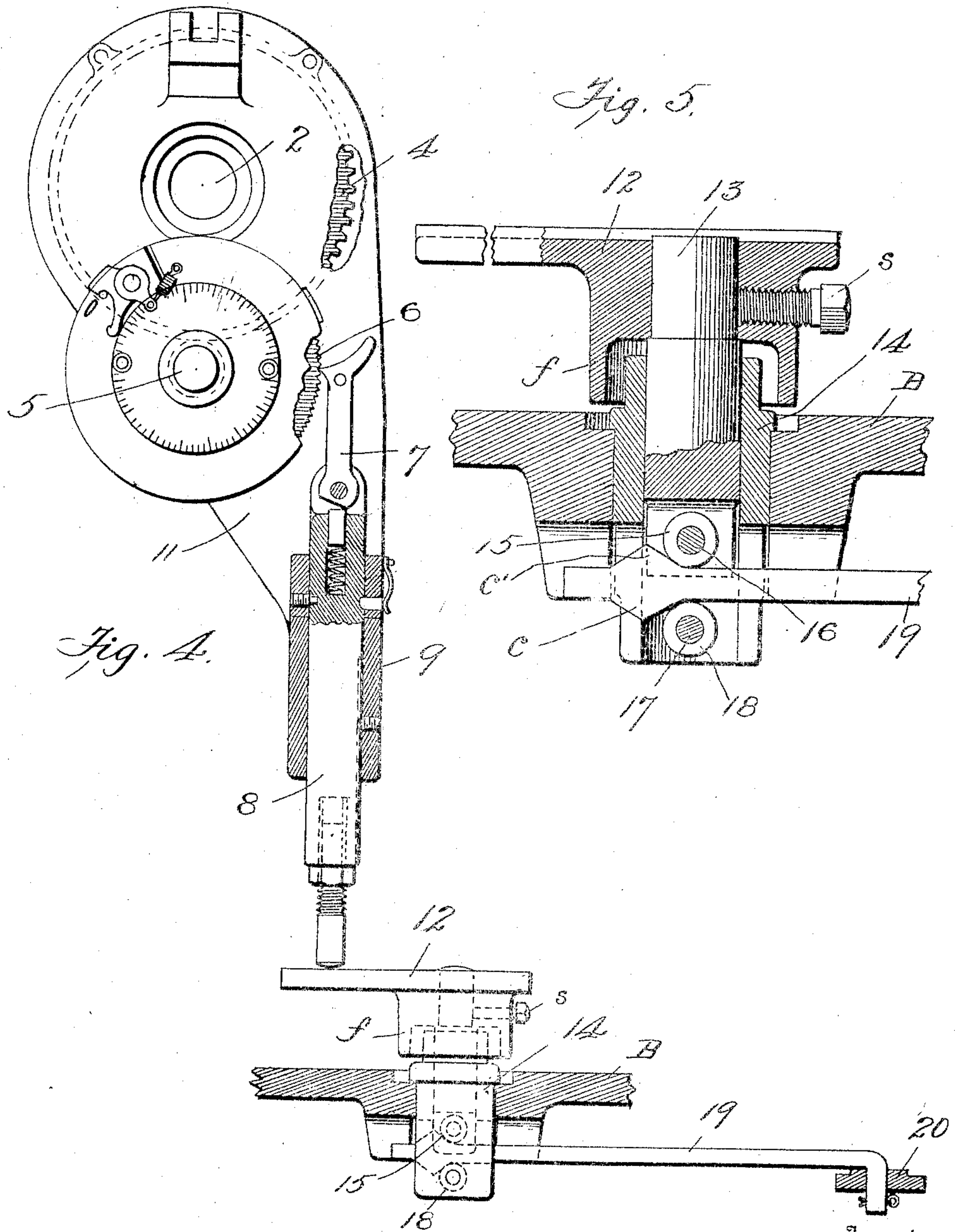
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2 SHEETS—SHEET 2.



Witnesses
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UNITED STATES PATENT OFFICE.

ABRAHAM B. LANDIS, OF WAYNESBORO, PENNSYLVANIA.

GRINDING-MACHINE.

No. 879,276.

Specification of Letters Patent.

Patented Feb. 18, 1908.

Application filed December 1, 1906. Serial No. 345,882.

To all whom it may concern:

Be it known that I, ABRAHAM B. LANDIS, a citizen of the United States, residing at Waynesboro, in the county of Franklin and State of Pennsylvania, have invented certain new and useful Improvements in Grinding-Machines, of which the following is a specification.

My said invention consists in certain improvements in the details of construction of the mechanism for automatically operating the grinding-wheel feed-mechanism of grinding machines, it consisting chiefly in detail improvements in that particular construction shown in my Patent No. 654,314 of July 24, 1900, whereby the operation of the automatic feed mechanism is rendered positive regardless of the weight and character of the work, all as will be hereinafter more fully described and claimed.

Referring to the accompanying drawings which are made a part hereof and on which similar reference characters indicate similar parts, Figure 1 is a side elevation of one end of a grinding machine showing the grinding wheel carriage and the automatic operating mechanism, Fig. 2 a horizontal section through the carriage on the dotted line 2—2 in Fig. 3, Fig. 3 a cross section through the carriage and a portion of the bed on the dotted line 3—3 in Fig. 2, Fig. 4 a detail view on an enlarged scale showing the automatic feed mechanism partly in elevation and partly in section, and Fig. 5 a sectional view on an enlarged scale of the parts at the lower end of Fig. 4 and on the dotted line 5—5 in Fig. 2.

In said drawings the portions marked A represent the bed of the machine, B the carriage, C the transverse slide on said carriage, and D the slider mounted on said slide and carrying the grinding-wheel base. All of said parts are or may be of the same construction and arrangement as shown in my patent above referred to, the carriage B being mounted to traverse back and forth upon suitable ways on the top of bed A, the slide C being mounted transversely on said carriage B for the slider D, which carries the grinding wheel. The slider D is fed to the work by the same arrangement of mechanism illustrated in said patent, consisting, in part, of the vertical shaft 1, the horizontal shaft 2 geared thereto, having a hand wheel 3 upon its outer end by which it may be operated by hand and a gear wheel 4 geared to a second shaft 5 having a ratchet wheel 6 adapted to be

operated by a pawl 7 pivoted on a vertical plunger 8 mounted in a suitable casing 9 carried from the casing 10 surrounding the shaft 2 by an arm or bracket 11.

Thus far the mechanism is of the same arrangement and operates in the same manner as shown and described in my patent above referred to and is shown herein merely to illustrate the use and operation of my present invention which relates wholly to the means for operating said plunger 8 at each reversal of the carriage. Said mechanism consists of a bearing plate 12 rigidly secured by a set-screw 13 on the top of a plunger 13. Said plunger is mounted to slide in a vertical bearing 14 which is mounted in a suitable perforation in carriage B in a position directly beneath the normal position of said plunger 8. The lower end of said plunger 13 is formed bifurcated and has a roller 15 mounted on a cross shaft or pin 16 near the upper end of said bifurcation. The vertical sleeve or bearing 14 is also bifurcated at its lower end and has a cross pin or shaft 17 on which is mounted a similar roller 18 near its lower end. A bar 19 having double-faced cams *c* and *c'* on its opposite edges and opposite each other is mounted between said rollers 15 and 18 and extends longitudinally of the machine beneath the carriage and is pivoted or hinged to the outer end of a transverse bar 20, which extends across the bed of the machine and has a downwardly projecting lip 21 on its opposite end, which engages with and is adapted to run in a longitudinal groove *a* in the top of bed A. Lugs *b* and *b'* are formed a short distance apart on the inner flange of the carriage B and project inwardly on each side of the inner end of said bar 20, being adapted to contact with said bar. Near the opposite end of said bar 20 downwardly projecting lugs *b²* and *b³* are formed on the under side of said carriage B with their adjacent edges in line with the adjacent edges of the lugs *b* and *b'* and are connected by a strap *b⁴* secured to their lower ends by screws *b⁵*, thus forming a loop which is adapted to carry and support this end of said bar 20. The plate 12 is formed with a downwardly projecting flange *f* which overhangs the top of bearing 14 and thus protects said bearing from dirt and grit as will be readily understood. Its top surface is formed with sufficient area so that it will at all times be under the lower end of plunger 8 regardless of the adjustment of the grinding wheel carriage.

In operation, the parts as shown in Fig. 2 are in normal position when the carriage is traveling in the direction indicated by the arrow in said figure. The double-faced cams *c* and *c'* on the bar 19 are close to the outer faces of the rollers 15 and 18 and the plunger 8 is resting upon the plate 12 with the grinding-wheel feed-mechanism at rest. When the carriage B reaches the limit of its travel in one direction and starts in the reverse direction the lugs *b* and *b'*, which have been resting against the adjacent edge of transverse bar 20, move away from said bar and as the lugs *b'* and *b* are at a distance from the opposite edge of said bar, said bar stops in its movement and as the carriage moves, the bar 19 pulling upon the opposite end of said bar 20 will operate to cramp the flange 21 in the groove *a* on the bed which will hold said bar 20 and said bar 19 locked in this position. The carriage will therefore carry the bearing 14 and the plate 12 in the reverse direction independent of said bar 19 causing the rollers 15 and 18 to pass over the cams *c* and *c'*. Said cam *c'* throws the end of bar 19 upwardly and elevates cam *c* at the same time roller 15 is riding over it, thus giving the plunger 13 and the plate 12 carried thereby a quick upward movement operating the plunger 8 and, through the mechanism connected therewith, the grinding-wheel feed-mechanism, in exactly the manner as described in my former patent above referred to. As soon as the carriage B travels in the reverse direction a sufficient distance to bring the lugs *b'* and *b* against the adjacent edge of the bar 20 said bar is immediately brought into a right-angular position, when its flange 21 will be parallel with the groove *a* and said lugs will then freely carry said bar 20 and the parts connected therewith along with the carriage until the limit of its motion in this direction is reached. When the carriage reverses the operating bars 19 and 20 are again locked temporarily in position, the rollers pass over the cams on the end of bar 19 and the grinding-wheel feed-mechanism again operated to move the grinding wheel into the work, all in the same manner as before.

By this construction a very positive locking means is secured and one which will not slip under any weight of load which may be brought to the mechanism. It will be understood that the cams *c* and *c'* are arranged as shown and described on bar 19 to secure an upward movement of plunger 13 equal to the pitch of both cams, but that the same result can be secured by a single cam of double the height of one of these, or by other suitable forms.

It will be understood, of course, that the automatic feed mechanism may be varied in form and arrangement from that shown herein, without departing from my invention, which relates only to the particular

means for operating it and may be used in connection with any feed mechanism for which it is adapted.

Having thus fully described my said invention, what I claim as new and desire to secure by Letters Patent, is:—

1. In a grinding machine, the combination with the automatic feed mechanism, of means for operating the same comprising a vertically movable table carried by the carriage, a double faced cam for operating said movable table adapted to move with said carriage during the greater extent of its movement, and means for locking said cam momentarily at each reversal of the movement of said carriage, substantially as set forth.

2. In a grinding machine, the combination of the automatic feed mechanism, means for operating the same at the reversal of the carriage comprising a part mounted upon a movable plunger carried by the carriage, a cam for operating said plunger, and means for locking said cam from movement with said carriage at each reversal of said carriage, substantially as set forth.

3. In a grinding machine, the combination of the automatic feed mechanism, means for operating the same, comprising a part carried by a plunger mounted to slide in suitable bearings in the carriage, a cam adapted to operate said plunger and mounted to move with said carriage, and means for locking said cam at each reversal of the movement of said carriage, substantially as set forth.

4. In a grinding machine, the combination with the automatic mechanism for feeding the grinding wheel to the work, means for operating said mechanism at each reversal of the movement of the carriage, comprising a part carried by a plunger mounted to slide in a bearing in said carriage, a roller in one end of said plunger, a cam mounted to move with the carriage and adapted to be locked to the bed of the machine momentarily at each reversal of said carriage, whereby said roller will pass over said cam and operate said plunger, substantially as set forth.

5. In a grinding machine, the combination of the mechanism for feeding the grinding wheel automatically to the work, means for operating said mechanism comprising a part carried on a plunger mounted in a bearing in the carriage, said plunger having a roller journaled thereon, said bearing having another roller journaled therein a short distance from said first roller, a bar having a double faced cam on each edge mounted between said rollers, said bar being mounted to move with said carriage throughout the extent of its traverse back and forth, and means for locking said bar to the bed of the machine momentarily at each reversal of the

traverse of the carriage, substantially as set forth.

6. In a grinding machine, the combination of the mechanism for feeding the grinding wheel automatically to the work, means for operating said mechanism, comprising a plunger mounted in a bearing in the carriage, a roller carried by said plunger, another roller carried by said bearing, a part provided with a double-faced cam on each edge mounted between said rollers, said part being mounted and normally carried by said carriage, and means for locking said part to the bed of the machine momentarily at each reversal of the carriage, whereby said carriage moves to carry said rollers over said cams and operate said plunger, substantially as set forth.

7. In a grinding machine, the combination of the automatic feed mechanism for the grinding wheel, and means for operating said mechanism, comprising a part mounted on a plunger mounted in a bearing in the carriage, a cam mounted to move normally with said carriage and arranged adjacent to the lower end of said plunger, said part being hinged to a transverse bar mounted between lugs a distance apart greater than the width of said bar and having a down-turned flange adapted to engage with a longitudinal groove in the bed of the machine; whereby as the carriage reverses said flange will cramp in said groove during the movement of the carriage to bring the opposite lugs against the transverse bar, substantially as set forth.

8. In a grinding machine, the combination with the automatic mechanism, operating mechanism for feeding the grinding wheel or mechanism for operating the same, comprising a plunger mounted in a bearing in the carriage, a cam adapted to move with the carriage throughout its movement back and forth, and means for locking said cam to the bed of the machine temporarily at each reversal of the movement of the carriage,

whereby said cam will stand stationary momentarily while the plunger moves over it and is operated thereby, substantially as set forth.

9. In a grinding machine, the combination of the automatic feeding mechanism for the grinding wheel, and means for operating the same, comprising a plunger mounted in a bearing in the carriage, a bearing face at the lower end of said plunger, another bearing face on the bearing, a double-faced cam adapted to operate between said bearing faces, means for carrying said cam back and forth with the carriage, and means for locking said cam temporarily in a stationary position at each reversal of the carriage, substantially as set forth.

10. In a grinding machine, the combination, of the bed, the carriage, means for traversing said carriage, the grinding wheel, and means for feeding said grinding wheel automatically to the work comprising a plunger mounted in the carriage, a cam carried by the carriage, means for locking said cam momentarily to the bed at each reversal of the carriage, and means for releasing it after the plunger has ridden over it.

11. In a grinding machine, the combination, of the bed, the carriage, the mechanism for automatically operating the feed mechanism comprising a cam mounted to normally move with said carriage but to have a limited independent movement, means for locking said cam stationary at each reversal of the carriage, and means for releasing it after it has operated the mechanism, substantially as set forth.

In witness whereof, I, have hereunto set my hand and seal at Waynesboro, Pennsylvania this 28th day of November, A. D. nineteen hundred and six.

ABRAHAM B. LANDIS. [L. s.]

Witnesses:

GEO. F. GORDON,
ALF. N. RUSSELL.