

No. 654,314.

Patented July 24, 1900.

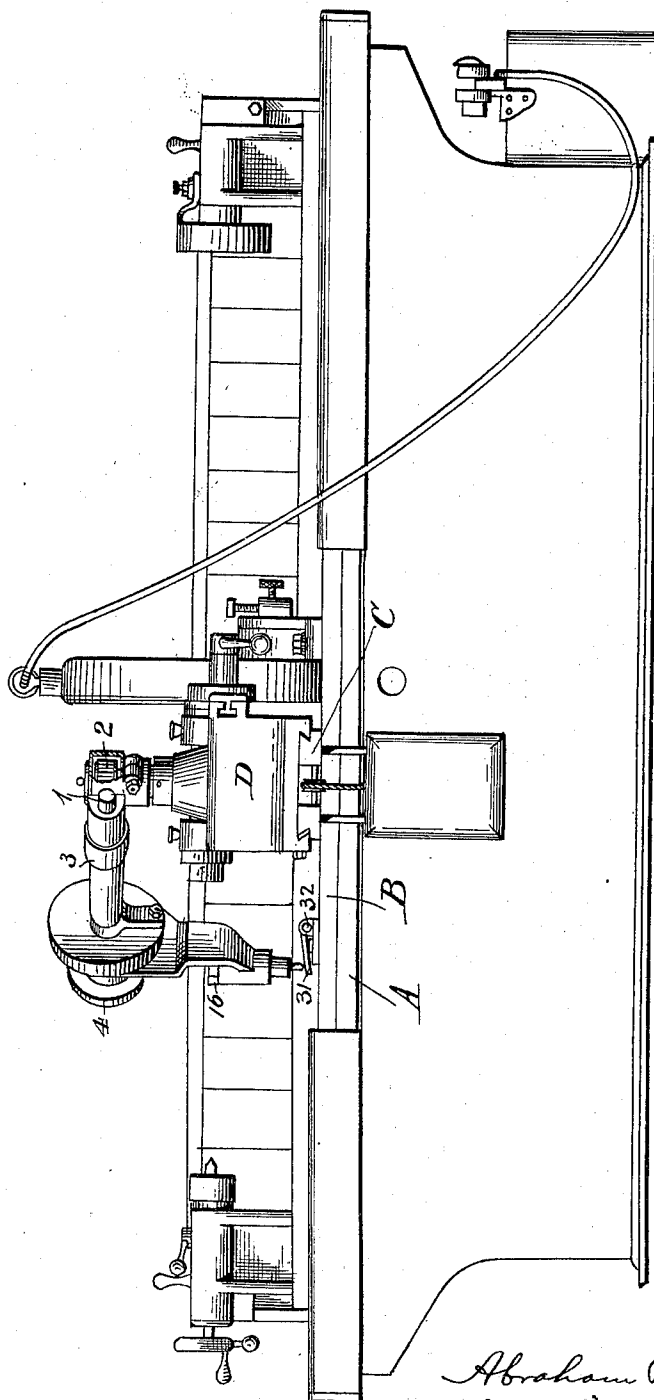
A. B. LANDIS.
GRINDING MACHINE.

(Application filed May 24, 1900.)

(No Model.)

3 Sheets—Sheet 1.

Fig. 1



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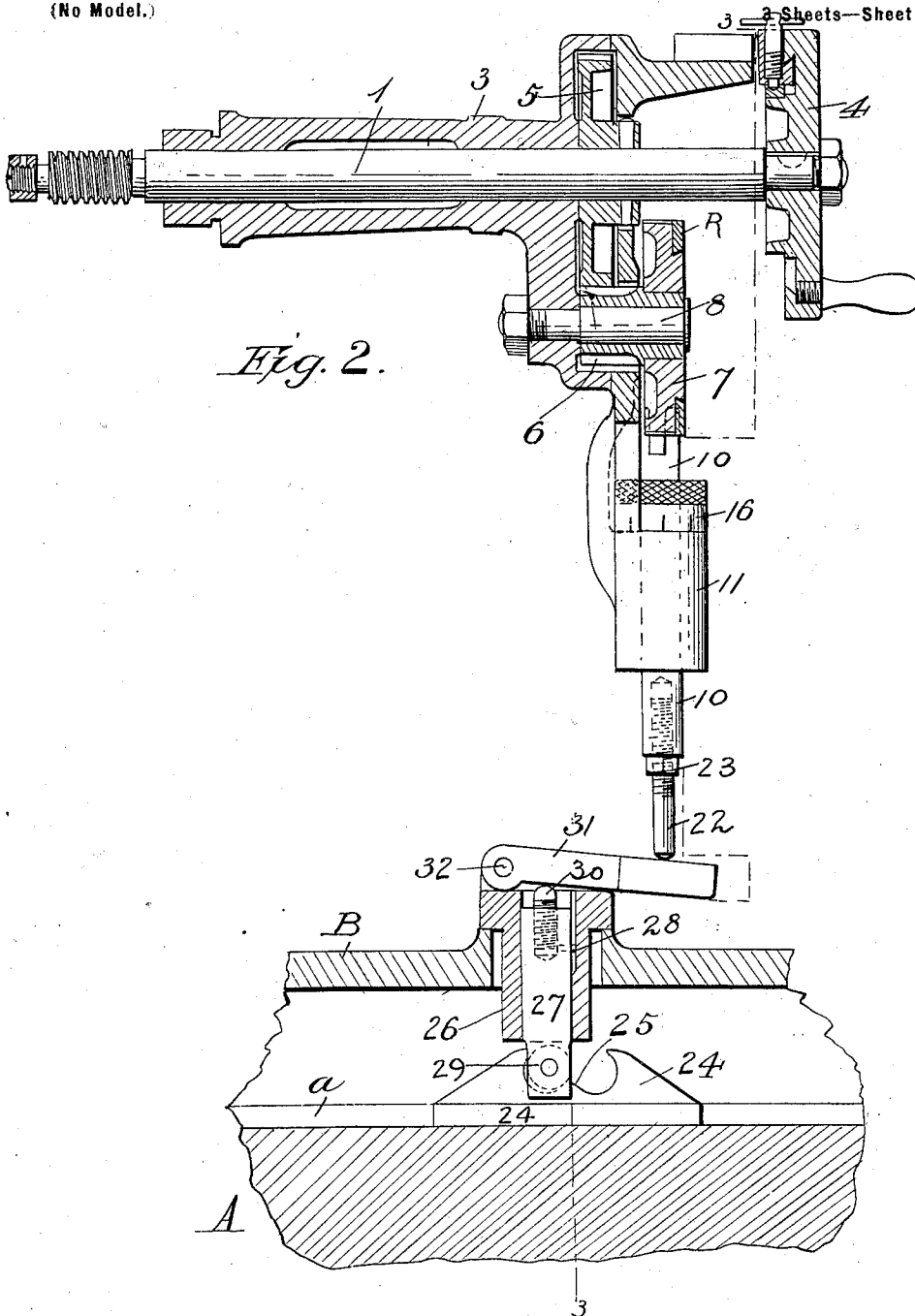
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2 Sheets—Sheet 2.



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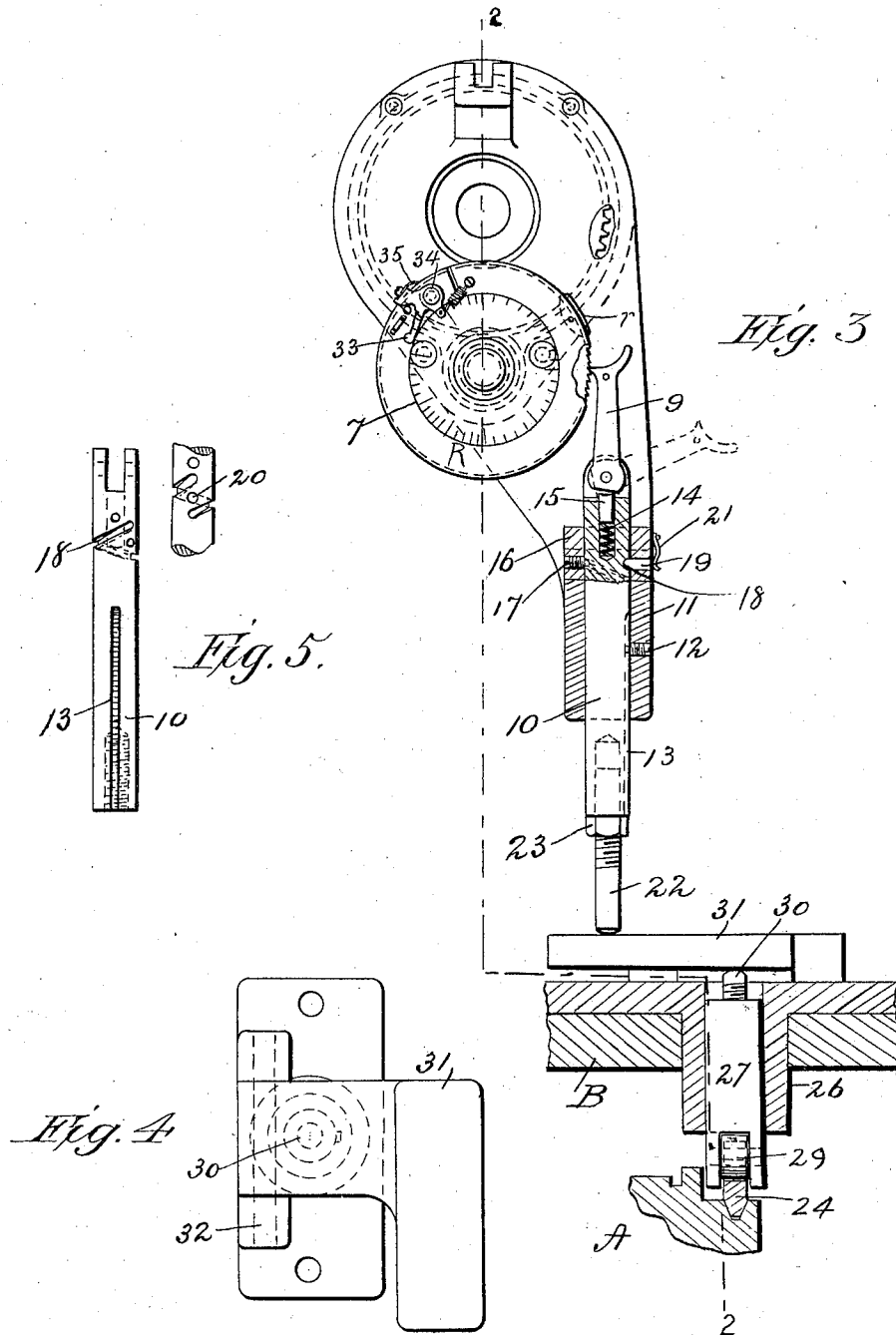
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UNITED STATES PATENT OFFICE.

ABRAHAM B. LANDIS, OF WAYNESBOROUGH, PENNSYLVANIA.

GRINDING-MACHINE.

SPECIFICATION forming part of Letters Patent No. 654,314, dated July 24, 1900.

Application filed May 24, 1900. Serial No. 17,866. (No model.)

To all whom it may concern:

Be it known that I, ABRAHAM B. LANDIS, a citizen of the United States, residing at Waynesborough, 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 present invention consists in improvements in the details of construction of the grinding-machine forming the subject-matter of my Patent No. 640,669, of January 2, 1900, and relates particularly to the means for operating the automatic feed mechanism of the grinding-wheel, whereby the use of the cord 60 and idlers of said patent and its connections are obviated and a more slightly and perfectly-operating means is provided, 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 rear side elevation of a grinding-machine embodying my said improvements; Fig. 2, a vertical sectional view through the parts to which my present invention relates on the dotted line 2 2 in Fig. 3; Fig. 3, a similar view on the dotted line 3 3 in Fig. 2; Fig. 4, a detail view showing the tripping-lever in top plan; and Fig. 5, details of a portion of Fig. 3, showing the particular construction of plunger 10.

In said drawings the portions marked A represent the bed of the machine, B the carriage, C the cross-slide, and D the slider carrying the emery-wheel, all of which parts are or may be of the same form and construction as shown in my above-mentioned patent or of any appropriate construction. The mechanism for feeding said wheel to the work is also of the construction and arrangement shown and described in said patent, embodying the horizontal shaft 1, engaging at its inner end by means of a worm-gear with a suitable gear 2 on the top of the vertical shaft, which feeds the emery-wheel through the connections, as fully described in said patent. Said shaft 1 is mounted in suitable bearings in the frame or casting 3 and has a hand-wheel 4 on its outer end. A gear-wheel 5 is mounted thereon in a suitable housing on the outer end of frame 3 a short distance from the outer

end, which meshes with a pinion 6, formed around the hub of the operating-wheel 7, which is journaled on a stud-shaft 8, mounted on a suitable depending portion of the frame 3. Said wheel 7 is in all respects, as to construction and operation, the same as wheel 6 of my above-mentioned patent, being geared to shaft 1 through the second wheel 5 instead of being directly mounted thereon, as in said patent, for the purpose of reducing the speed of said shaft, as may be required in the large-sized machine of the character illustrated. Said wheel has transverse serrations around its periphery, with which a dog or pawl 9 is adapted to engage. Said pawl is pivoted on the upper end of a reciprocating plunger 10, which is mounted in a socket or bearing 11 on the lower portion of the frame 3. Said plunger is held from rotation by means of a spline 12, projecting through the socket and engaging a vertical groove 13 therein. Said pawl is held to engagement with said wheel by means of a spring 14, bearing a block 15 against a straight face formed on its under side at the proper angle with sufficient force. A graduated collar 16 is mounted on the upper end of said plunger 10 to limit its downward movement. It is adjustable thereon by means of a pin 17, which projects through one of its sides and engages a spiral groove 18, which extends around said plunger at this point and is held in adjusted position by means of a pawl 19 in the form of a pin mounted in a perforation in the side of the collar opposite the pin 17, which pawl is adapted to engage with one of a series of depressions or sockets 20, of sufficient depth to furnish the necessary support, formed around said plunger at such a distance apart that a movement of the collar sufficient to move the pawl from one to the next will adjust the plunger that distance required to enable the pawl 9 to engage one notch, more or less, in the periphery of wheel 7. Said pin is held into engagement by a spring 21, which also permits said pin to slide back by the turning of said collar. The lower end of said plunger is provided with a longitudinal perforation, in which is mounted an adjustable extension 22, rendered adjustable by the nut 23 thereon.

Near the edge of the guide in the bed A a longitudinal groove *a* is formed having tapered sides, and a sliding shoe 24 is mounted

therein, its lower portion being wedge-shaped in cross-section to fit said tapered sides. In the top of said shoe is formed a cut-out portion, on the bottom of which is formed a double-faced cam 25. A socket 26 is mounted in a suitably-located aperture in the carriage B, and a plunger 27 is mounted therein, being held from rotation by a spline 28 engaging a groove in one side of said socket. The lower end of said plunger is bifurcated and has a roller 29 journaled between its branches, which extend down on each side of the shoe 24, while said roller engages with said cut-out and is adapted to ride over said cam 25 in the center thereof. In the top of said plunger is mounted an adjustable extension 30 by means of a screw-threaded connection. A trip-lever 31 is hinged to one side of the top of said plunger on a suitably-located pintle 32, against the under side of which the top of extension 30 of plunger 27 is adapted to operate, while the lower end of extension 22 of plunger 10 rests upon its top. The trip-lever in the construction shown is only for increasing the movement of the plunger 10, and it is obvious that the plunger 27 could have a plate secured and carried on its top which would move said plunger 10 direct, additional movement being secured, if required, in such case by a higher cam in the shoe 24 and a longer movement of the carriage to operate it or by multiplying devices above it without departing from my invention. The top of the lever or plate is made of considerable width transversely of the machine to allow the slide of the emery-wheel without interfering with the operation of the feeding device. The shoe, as will be seen, has hook-shaped formations at each end of the cut-out, under which the roller 29 will engage after passing the cam to relieve the shoe of its frictional pressure in the groove, and permit it to slide freely. It will thus be seen that as the carriage reverses its motion the roller 29 will ride over the cam 25, the downward pressure while passing over said cam being sufficient to lock the shoe 24 at the reversing-point by reason of the tapered sides of the engaging portions, which forces plunger 27 upward, which in turn raises the outer end of the hinged lever 31, which forces plunger 10 upward and through pawl 9 on its upper end rotates wheel 7 the predetermined distance and through the connections before described feeds the grinding-wheel forward to the work. When a greater or less feed is desired, it is secured by adjusting plunger 10 by means of collar 16, so that pawl 9 will drop back after operation to engage a greater or less number of notches on the periphery of wheel 7, as before described. Said collar being graduated, its adjustment can be made exact, each division representing an adjustment that will give the pawl play over one more or one less tooth on the wheel 7 and regulate the feed of the grinding-wheel by one-thousandth of an

inch. Said wheel 7 is provided with an adjustable rim R, having a trip *r* in its edge, adapted to throw said dog 9 out of engagement with the periphery of wheel 7 and stop the feeding operation when the work has been reduced to the predetermined point. Said rim also has the lever 33 mounted thereon by means of the pivot 34 and carrying a pawl 35, engaging with the serrations in the periphery of wheel 7 as the means for adjusting it. These features of construction and operation of wheel 7 are in all respects the same as shown and described in my above-mentioned patent and require no detailed description herein.

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, of the bed, the carriage mounted to travel thereon, the grinding mechanism on said carriage, an automatic feed mechanism for said grinding mechanism, and an operating device for said feed mechanism consisting of a shoe adapted to travel with said carriage and having a cam which upon reversal of the travel operates to trip said feed mechanism through connecting devices, substantially as set forth.

2. In a grinding-machine, the combination, of the bed, the carriage, the grinding mechanism mounted on said carriage, the automatic feed mechanism for said grinding mechanism, and a part mounted in a way on the bed and connection with said carriage to travel therewith, which part is provided with a cam-face, and connecting devices running from said cam to the operating-wheel, whereby, when the carriage reverses said parts ride over said cam, and operate the wheel, substantially as set forth.

3. In a grinding-machine, the combination, of the bed, the carriage, the grinding mechanism on said carriage, the automatic feed mechanism for said grinding mechanism, which mechanism embodies a wheel with toothed or serrated periphery, a pawl for intermittently operating said wheel, a plunger connected with said pawl, a lever hinged to a part on the carriage with its outer end beneath the lower end of said plunger, a second plunger mounted in a socket in said carriage with its top beneath said lever, and its lower end engaging a shoe mounted to slide in a way in the bed, said shoe being formed with a cam-face over which the lower end of said plunger is adapted to ride when the carriage reverses, whereby said parts are operated, substantially as set forth.

4. In a grinding-machine, the combination, of the bed, the carriage, the grinding mechanism mounted thereon, mechanism for feeding the grinding-wheel to the work automatically, a cam for operating said feeding mechanism forming part of a shoe formed with tapered sides and mounted in a correspondingly-formed groove in the bed, said cam being located midway of a limited movement

of the operating devices over said shoe, whereby, as the carriage reverses in movement, the pressure upon said cam will lock said shoe in the groove until the parts have passed and the mechanism been operated, substantially as set forth.

5 5. The combination in a grinding-machine, of the bed, the carriage, the grinding mechanism, the automatic feed mechanism, and a cam connected with said mechanism for operating it, said cam being connected with the bed and arranged to trip said mechanism as the carriage reverses, substantially as set forth.

15 6. The combination in an automatic feed mechanism for grinding-machines, of a cam adapted to travel with the carriage and engage with the bed at each reversal of said carriage, whereby the operating parts pass over it, and are operated, substantially as set forth.

25 7. In a grinding-machine, the combination, of the bed, the carriage, the grinding mechanism, the automatic feed mechanism embodying the wheel 7, the pawl for operating said wheel mounted on a reciprocating plunger, a collar adjustably mounted around the top of said plunger, whereby the position of the pawl in relation to the wheel when the parts are at rest may be regulated, the cam carried by the carriage and running in a way on the bed, the plunger operated thereby, and the connecting parts, substantially as set forth.

35 8. In a grinding-machine, the combination, of the bed, the carriage, the grinding mechanism, the automatic feed mechanism, the plunger carrying the pawl for operating said feed mechanism, the hinged lever on the carriage, the plunger mounted in a sleeve mounted in an elongated perforation in said car-

riage beneath said lever, the shoe with the cut-out portion in its top having a central cam-face on its bottom, and a suitable bearing-face on the lower end of said plunger to engage with said cut-out portion and ride over said cam, said shoe being mounted to slide in a way on the bed, substantially as set forth.

9. In a grinding-machine, the combination, of the bed, having a V-shaped longitudinal groove, a shoe correspondingly formed and mounted to slide therein, said shoe being formed with a cut-out place in its top with a double cam-face on its bottom, a plunger connected with the carriage and engaging in said cut-out place in said shoe and adapted to ride over said cam as the carriage reverses, forcing said shoe into close frictional contact with said V-shaped groove and operating said plunger, the grinding mechanism, the automatic feed mechanism, and connections between said feed mechanism and said plunger, whereby it is operated as the carriage reverses, substantially as set forth.

10. In a grinding-machine, the combination, of the bed, the carriage, the grinding mechanism, and the feeding mechanism embodying a shoe connected with the carriage mounted to slide in a way on the bed, said shoe being formed with a cam and a hooked formation on each side thereof, and a bearing part connected with the carriage and adapted to ride over said cam, and engage said hooks, substantially as set forth.

In witness whereof I have hereunto set my hand and seal, at Waynesborough, Pennsylvania, this 19th day of May, A. D. 1900.

ABRAHAM B. LANDIS. [L. S.]

Witnesses:

D. M. RUSSELL,
H. M. UNGER.