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Patented July 24, 1900.

A. B. LANDIS.  
GRINDING MACHINE.

(No Model.)

(Application filed May 19, 1900.)

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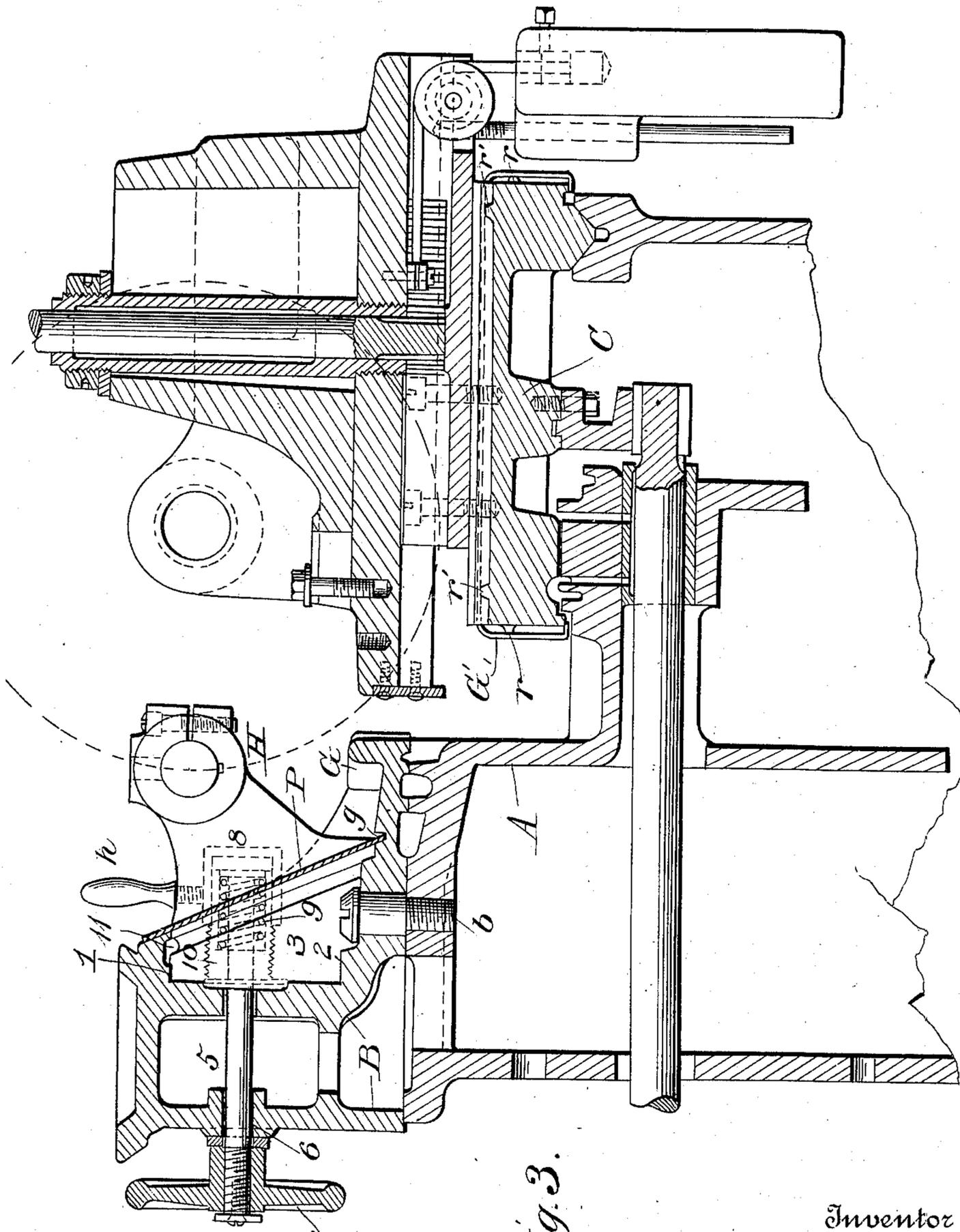


Fig. 3.

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# UNITED STATES PATENT OFFICE.

ABRAHAM B. LANDIS, OF WAYNESBOROUGH, PENNSYLVANIA.

## GRINDING-MACHINE.

SPECIFICATION forming part of Letters Patent No. 654,313, dated July 24, 1900.

Application filed May 19, 1900. Serial No. 17,313. (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 various improvements in the details of construction of grinding-machines of that general character shown in Patent Nos. 649,317 and 640,669 and others heretofore granted to me, whereby the ways and bearing-surfaces for several of the parts are protected from dust, dirt, and water and said parts supported in a manner to permit of their convenient manipulation and efficient operation, 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 rear elevation of a machine embodying my said improvements; Fig. 2, a detail view showing one end of the bed, carriage, and guard as seen when said carriage projects beyond the end of said bed; Fig. 3, a cross-section through the same; Fig. 4, a view similar to a portion of Fig. 2, on an enlarged scale, showing the parts more clearly; and Fig. 5, a detail top plan showing one of the work-holding stocks and adjacent parts.

In said drawings the portions marked A represent the bed of the machine, B the table supporting the head and foot stocks, and C the carriage on which the grinding-wheel is mounted.

The bed A and the principal parts of the machine are of substantially the same construction as shown in my former patents above mentioned and need no special description herein.

The table B is mounted on its side of the bed by the usual pivot *b* or in any appropriate manner. Its base extends back to a point under the work and has a suitable gutter G at its rear edge to collect and conduct away the water. In front of said gutter a longitudinal groove *g* is formed in its top surface to receive and support the lower ends of the plates P, composing the sectional water-guard. The front portion is elevated to a point above

the plane of the work and is in the form of a hollow casting of sufficient dimensions in cross-section to furnish suitable supports for the parts carried thereby. On its rear side it is formed with an open-sided way, in which the head and foot stocks are mounted and adapted to be adjusted, consisting of a projecting flange 1 at the top and a ledge 2 at the bottom, with opposite horizontal surfaces planed to a true angle with the adjacent portions of the vertical face of said rear side. The base 3 of the foot-stock H and the base 4 of the head-stock F are formed to fit between the horizontal faces 1 and 2 and rest against the adjacent vertical portions of the rear side of the table, their surfaces being dressed to make a perfect and true bearing. They are held to their seats by means of bolts 5, which pass through perforations therein and longitudinal slots 6 in the table, and are provided with hand-nuts 7 on the outer ends, by which said stocks may be firmly clamped upon their seats. Between the head 8 of said bolt and the adjacent face of the part through which it extends is interposed a spring 9, for purposes presently to be described. For convenience in manufacture I have formed the perforation in the base large and mounted a sleeve 10 therein by means of a screw-threaded connection, said spring being incased by said sleeve and the head of the bolt bearing against its outer end when drawn tight to clamp the stock to its seat. The spring is interposed between said bolt-head and the internal shoulder around the inner end of said sleeve. By means of this arrangement when the hand-nut is backed to loosen the stock to permit it to be adjusted the spring expands and bearing between the bolt-head and the base holds said base to its seat, thus preventing it from tilting down and resting unevenly upon its bearings, while permitting it to be adjusted back and forth longitudinally of the machine to suit the length of work to be ground. A handle *h* is provided on each stock, which the operator may seize with one hand while he takes hold of the hand-nut 7 with the other, and by these means is enabled to conveniently move the stock along to the desired position after said nut has been loosened.

The water-guard is made up of a series of

plates P, the upper ends of which rest against an inclined face on the outer edge of the flange 1 at the top of the table and lower ends of which rest in and are supported by the longitudinal groove *g*, their edges overlapping to form an efficient protection for the ways beneath against the water and grit thrown from the grinding-wheel. A groove 11 is preferably formed around the base of each stock, near the outer edge of its bearing-face, and extends diagonally from top to bottom, in which any water which may pass through the guard by capillary action or otherwise may collect and be conducted to the bottom, where it will run out over the top surface of the rear side of the table into gutter G and be carried away with the rest. By this means, as will be readily seen, the head and foot stocks are so mounted that they may be quickly and conveniently adjusted or removed and replaced, while their bearings or ways are efficiently protected from the action of water and grit. The guard-plates P, being narrow, are conveniently removed when it is desired to get to the bearings or the clamping means, and as they overlap and rest closely against the sides of the projecting arms of the stocks, covering the bases thereof, which are in the ways, all access to said ways is covered.

The traveling carriage C is mounted on its side of the bed A and carries the grinding mechanism and is operated in the usual manner or as shown in my Patent No. 639,900. In order to protect the ways on which it travels on the bed, I have provided guards G', preferably formed of sheet metal and each in the form of an inverted box with one end open and of a size to just inclose said carriage, which preferably has longitudinal ribs *r* formed on its sides and *r'* on its top near the corners to support said guards. One of said guards is mounted over each end of the carriage. Its closed end extends to below the plane of the top of the bed and contacts therewith at the limit of its inward travel, being thus held at the point where it will cover the ways or carriage-guide to its outer extremity. The lower edges of the sides of each guard are preferably bent under the lower edges of the carriage, as shown, to better serve its purpose and retain it in position. Each guard is provided with a spring-catch 12, attached to its end to project inward and engage with a notch 13, formed in an appropriate part on the adjacent portion of the bed. Each guard is a duplicate of the other in construction and operation, and it will therefore be understood that the description of one is the description of both. In operation, the carriage being arranged with the guards, as shown in Fig. 1, it can travel back and forth within the limits of the length of the bed, with its ends telescoping under said guards; but when its travel projects one or both of its ends beyond the end of the bed the end of the carriage will come against the end of the guard and force

it along with it, as shown in Fig. 2, freeing the catch 12 from its engagement. In its return movement the carriage will carry the guard back, and the friction between the parts will be sufficient to carry the guard until the catch 12 rides over into the notch 13 and engages. By reason of the long angle of the parts which engage in this direction and the flexibility of the spring but little force is required to accomplish this; but the angle on the opposite side of the catch is made shorter and more abrupt, so that the engagement will be sufficient to resist the force of the friction between the carriage and guard until the ends come together and the catch is forcibly disengaged. By reason of the ribs *r r'* the friction between the guards and carriage is reduced to a minimum, and any dust or dirt which may collect on the exposed top surface of the carriage is not brushed onto the ways or guides beneath. By this arrangement and form of guards the carriage-ways are thoroughly protected in all positions, and the length of the bed and the extension of the carriage beyond the bed when extended constitute the limit of their extension, so that no additional room is required by their use.

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 grinding mechanism, the head and foot stocks, a table formed with an open way on its rear side to receive and support said head and foot stocks, means for clamping said stocks in said way, and a water-guard consisting of plates extending at an angle from near the top of said table to its bottom and covering said way, substantially as set forth.

2. In a grinding-machine, the combination, of the bed, the grinding mechanism, the table for supporting the work-holding device which table extends to a point above the work and is formed with an open way on its side adjacent to said work, the work-holding devices mounted in said way, means for holding them in place, and a water-guard covering said way consisting of plates extending from top to bottom thereof, substantially as set forth.

3. In a grinding-machine, the combination, of the bed, the grinding mechanism, the table for head and foot stocks formed with an open way therefor on its rear side, said stocks mounted in said way, and a water-guard consisting of plates with their lower ends resting in a longitudinal groove in the base-plate of said table and their tops resting against the top of said table, substantially as set forth.

4. In a grinding-machine the combination, of the bed, the grinding mechanism, the work-supporting table formed with its front portion extending above the plane of the work and having an open way on its rear side for the head and foot stocks, said head and foot stocks mounted in said way to be adjusted,

a clamping-bolt for holding each to its seat, and a spring interposed between a part on the bolt and a part on the stock, whereby when the nut on said bolt is loosened the stock will still be supported truly on its seat, substantially as set forth.

5. In a grinding-machine, the combination, of the bed, the grinding mechanism, the work-supporting table formed with its front portion extending above the line of work and having an open way on its rear side for the head and foot stocks, said head and foot mounted therein to be adjusted, the clamping-bolts for securing them in place, each of said clamping-bolts being provided with a head and each of said stocks being provided with a sleeve or socket to receive said bolt and with the end of which the head of said bolt engages, and a spring mounted in said sleeve or socket between its base and said bolt-head, substantially as described and for the purposes set forth.

6. In a grinding-machine, the combination of the bed, grinding mechanism, the carriage on which the same is mounted, and guards mounted over the ends of said carriage consisting of casings covering the carriage ways or guides and arranged to telescope with the ends of said carriage, substantially as set forth.

7. In a grinding-machine, the combination, of the bed, the grinding mechanism, the carriage for the same mounted in ways on said bed, and guards for said ways consisting of casings formed to telescope on the ends of said carriage and having closed outer ends carrying catches which are adapted to engage with a part on the bed and hold said guards stationary while the carriage is moving within the limits of the length of the bed but are adapted to be disengaged to permit said guard to move

with the carriage when it passes said limit, substantially as set forth.

8. In a grinding-machine, the combination, of the bed, the carriage for carrying the grinding mechanism mounted in ways thereon, longitudinal ribs formed on said carriage, a casing formed to telescope on the ends of said carriage and mounted thereon supported by said ribs, and means for preventing the outer ends of said casing from passing inward over the ends of the carriage-ways, substantially as set forth.

9. In a grinding-machine, the combination, of the bed, the carriage for the grinding mechanism mounted on ways thereon, the guards each consisting of a casing adapted to telescope on one end of said carriage, its outer end being closed and extending down to below the top plane of the bed, a catch mounted on one part and adapted to engage with the other consisting of a spring bent to present a long angle to the engaging surface when the carriage travels inward and short angle when it travels outward, substantially as set forth.

10. In a grinding-machine, the combination, of the bed, the carriage, the grinding mechanism mounted thereon, the work-holding mechanism, the holding devices mounted in ways to be adjusted, guards covering said ways, and guards incasing the ends of the carriage and covering its ways, all substantially as set forth.

In witness whereof I have hereunto set my hand and seal, at Waynesborough, Pennsylvania, this 16th day of May, A. D. 1900.

ABRAHAM B. LANDIS. [L. S.]

Witnesses:

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D. M. RUSSELL.