No. 635,753. Patented Oct. 31, 1899.

G. DIAZ.

GRINDING MACHINE.

(Application filed May 18, 1899.)

(No Model.) 2 Sheets—Sheet 1.

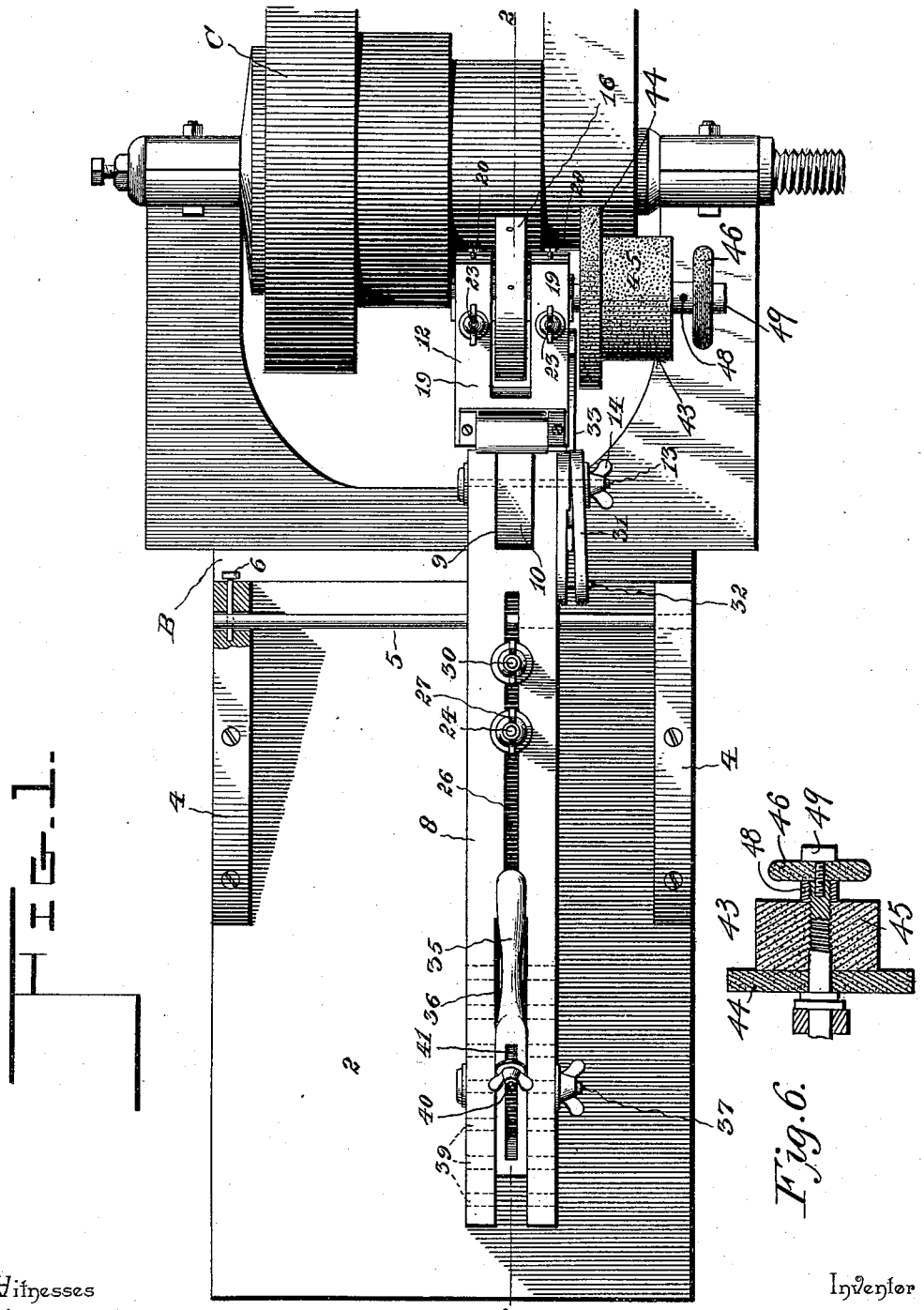


Fig. 1.

Fig. 6.

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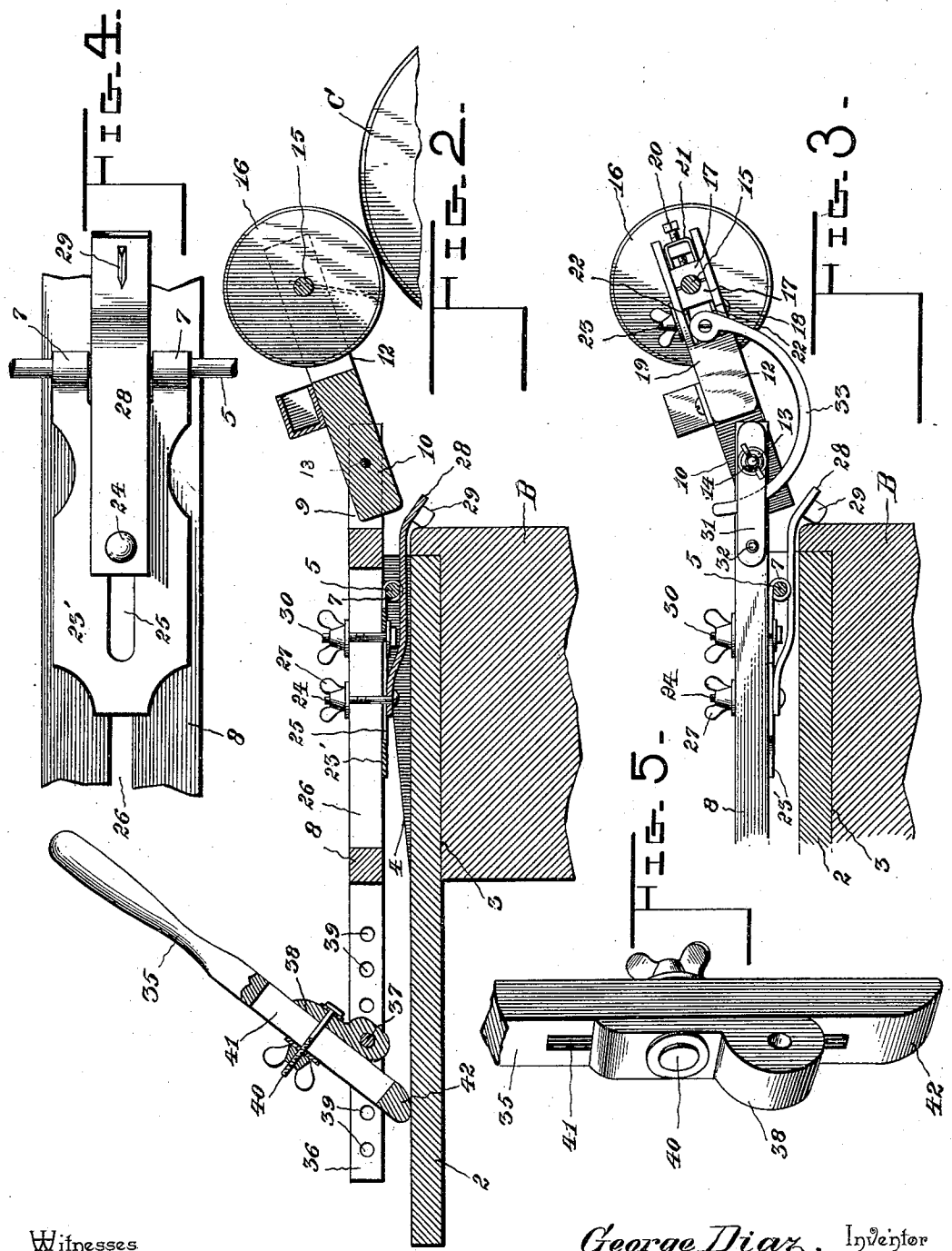
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UNITED STATES PATENT OFFICE.

GEORGE DIAZ, OF MEXICO, MEXICO.

GRINDING-MACHINE.

SPECIFICATION forming part of Letters Patent No. 635,753, dated October 31, 1899.

Application filed May 18, 1899. Serial No. 717,280. (No model.)

To all whom it may concern:

Be it known that I, GEORGE DIAZ, a citizen of the United States, residing at the city of Mexico, in the Republic of Mexico, have invented a new and useful Grinding-Machine, of which the following is a specification.

This invention relates to grinding-machines; and the object of the invention is to provide a simple and inexpensive device of this character which is adapted more especially for use in connection with turning-lathes, either wood or iron, and with slight changes can be adapted for other machines. The machine includes in its construction a grinding-wheel or other dressing device, a shaft carrying the same, a driving member on said shaft, a frame for supporting the shaft, a device for supporting the frame, and means for locking said frame in an adjusted position. It will be evident that the frame which sustains the grinding-wheel shaft is adjustably mounted, whereby the frame can be adjusted for the purpose of throwing the driving member referred to into contact with the cone-pulley of the lathe, in which position the frame can be held by suitable locking means. The device which supports the emery or other grinding wheel frame is shiftably supported and is operated, preferably, by a cam-lever for the purpose of throwing the periphery of the driving-wheel, which is carried by the grinding-wheel shaft, into contact with any one of the sections of the cone-pulley.

From the foregoing description it will be evident that the grinding-wheel can be driven by any one of the sections of the cone, thereby to secure variations in speed of the grinding-wheel to suit different cases, and for the purpose of obtaining the differences in speed the device or main frame which carries the auxiliary or emery-wheel frame is laterally adjustable.

With these ends in view the invention consists in the novel combination of elements and in the construction and arrangement of parts, which will be hereinafter fully described and claimed.

To enable others to understand the invention, I have illustrated the preferred embodiment thereof in the accompanying drawings, forming a part of this specification, and in which—

Figure 1 is a top plan view of the head end of a common form of lathe provided with a grinding-machine constructed in accordance with my invention. Fig. 2 is a longitudinal section and partial side elevation, the section being taken on the line 2 2 of Fig. 1. Fig. 3 is a side elevation of the front portion of the device, showing the means for locking the auxiliary frame in its adjusted position. Fig. 4 is an under side plan view of the means employed for locking the main frame in its longitudinal and lateral adjustments. Fig. 5 is a perspective view of the lower end of the operating-lever. Fig. 6 is a detail sectional view showing the preferred manner of assembling the several elements constituting the grinding-wheel on the arbor or shaft driven from the cone-pulley of the lathe.

Like characters denote like and corresponding parts in each of the several figures of the drawings.

In the drawings I have represented at B a portion of the bed of a lathe of known construction, which is provided with the usual cone-pulley C, which serves as a means for transmitting power to the grinding or emery wheel of the machine for the purpose of rotating said wheel, the motion being transmitted through an intermediate wheel 16, shiftable into frictional contact with the cone-pulley by manually-controlled means.

The different parts of the machine are preferably supported upon a base-piece or plate 2, which is usually rectangular and which is fitted in a correspondingly-shaped opening 3, the latter being of such a depth that when the plate or base-piece is in place its upper face will be flush with the upper surface of the bed.

The brackets or bearings 4 are secured to the base-piece or plate 2, at opposite sides thereof, by means of screws or other convenient attaching devices and have holes to receive the opposite ends of the shaft 5, which is held in place by a pin 6, extending through one end of one of the bearing-brackets and the end of which is fitted in a socket in said shaft.

The shaft 5 extends through the bearing-sleeves 7, secured to the under side of the main frame or carrier 8, near the forward end thereof, and these sleeves are adapted to

slide upon the shaft, whereby the main frame or carrier, which is in the nature of a lever, can be adjusted laterally, and the shaft serves as a fulcrum upon which a second adjustment is made. The main frame or carrier 8 has at its inner end the square aperture or slot 9 to receive the correspondingly-shaped tongue or shank 10, extending from the auxiliary frame 12, said tongue being freely fitted in the aperture and being held in place by a pivot 13 in the nature of a bolt, having at one end the wing-nut 14, which constitutes a means for locking the auxiliary frame in an adjusted position.

The auxiliary frame 12, which directly sustains the grinding mechanism, is bifurcated or forked, and the shaft 15 passes through the bifurcated end and sustains the driving-wheel 16, which is illustrated as a frictionally-operated device and which is fixed in some well-known manner to the shaft 15. The shaft 15 is rotatively supported by the adjustable bearing-blocks 17, located in the squared sockets 18, formed in the arms 19 of the auxiliary carrier. The bearing-blocks are engaged by the adjusting-bolts 20, extending through the transverse portion of the U-shaped block-carriers 21, the inner ends of which fit into the notches 22, communicating with the square sockets 18. The holding-bolts 23 extend through the arms 19 of the auxiliary frame and also through the branches of the U-shaped parts 21, which receive the blocks 17, and are provided with winged or other nuts for the purpose of holding the parts in fixed relation.

The locking-plate 23′ is secured to the under side of the main frame 8 by means of the bolt 24, which is adapted to extend through the longitudinal slot 25, formed in said plate, and also through the longitudinal slot 26, formed in the frame, which slots are adapted to register, and the bolt is provided upon its upper end with the nut 27. Between the head of the bolt 24 and the longitudinal plate 23′ the locking tongue or strip 28 is disposed, said part having a bolt-opening and being adapted when in its effective position to fit tightly against the under surface of the plate 23′. The locking-tongue is of compound curvature, and it is provided near its free end with the projection or tooth 29, beveled upon its working edge to engage the inner surface or edge of the base-piece 2. At a point between the bolt 24 and the projection or tooth 29 a second bolt 30 is provided, which extends through the registering slots 25 and 26 and which is provided upon its upper end with the usual winged nut and washer, and by turning the nut the washer can be forced into firm contact with the upper face of the main frame 8 for the purpose of preventing any motion around the locking-bolt 24, whereby the face of the driving-wheel 16 can be held squarely against the face of the cone. The tightening of the nut on the bolt 24 prevents longitudinal movement of the main frame 8.

By adjusting the auxiliary frame 12 the driving-wheel carried thereby can be moved into engagement with the periphery of any one of the sections of the cone C, and the auxiliary frame can be held in the adjusted position by means of the winged nut 14 on the end of the pivot-bolt 13, between which and the end of the auxiliary frame the locking-plate 31 is disposed, said plate having an opening at one end to receive the bolt and having an opening at its opposite end to receive the guide-pin 32, extending laterally from the main frame. The locking-plate 31 is forced into engagement with the curved or segmental arm 33, the forward end of which is secured to one side of the auxiliary frame or bracket 12 and the free end of which is located intermediate the locking-plate 31 and the main frame 8. The arm 33 is in the nature of a torsional spring, and its free end is forced against the side of the main frame or carrier 8 by the inward movement of the locking-plate 31, due to the action of the nut 14 as the latter is turned on the threaded end of the pivot-bolt. It will be therefore understood that the driving-wheel 16 is thrown into contact with the peripheries of the respective sections of the cone by the combined adjustments of the two frames, the frame 8 being moved either forwardly or backwardly and the frame 12 being raised or lowered to secure the object sought.

The frictional contact between the driving-wheel 16 and the cone-pulley C can be regulated by the hand-lever 35, supported between the walls of the longitudinal slot 36 and movable upon the bolt or fulcrum 37, extending through the bearing 38 on said lever and also through two of a series of transversely-alined openings 39, formed in the outer end of the main frame. By removing the pivot-bolt 37 from the openings in which it is located the position of the hand-lever 35 can be varied—that is, said hand-lever can be moved either inward or outward—and when properly positioned it will be held in place by the insertion of the pivot-bolt. The bearing 38 at the lower end of the hand-lever is adjustably connected thereto by means of the bolt 40, extending through said bearing and also through the longitudinal slot 41 near the lower end of the lever. By loosening the bolt 40 the lever 35 can be shifted longitudinally and relatively thereto for the purpose of regulating the elevation of the rear end of the main frame 8 to meet certain conditions. The hand-lever 35 terminates at its working end in the cam portion 42, the working face of which is adapted to roll upon the upper surface of the base-piece 2, near the outer end of the latter, and at a point remote from the cross-shaft 5. Normally the lever lies against the upper face of the frame 8, and by lifting the lever the cam portion 42 is carried into contact with the base-piece, whereby the rear end of the frame will be elevated as the lifting action of the lever continues, thereby to force the wheel 16 into engagement with the cone, and by

throwing the lever over a dead-center line it and the frame 8 can be locked in their shifted positions. To carry the driving-wheel out of contact with the pulley the lever will be lowered.

So long as the driving-wheel 16 is in contact with the pulley C the grinding-wheel 43 upon the shaft 15 will be rotated, and the speed of rotation can be varied by shifting the main frame sidewise and forcing the driving-wheel into contact with another section of the cone.

It has already been explained that the herein-described grinding-machine is especially adapted for use as an attachment for turning-lathes, and it may be further explained that the invention is primarily designed as a tool-sharpener for the edged tools used by wood and iron turners; but it will of course be understood that the machine or attachment can be utilized for grinding or sharpening any kind of tools or other objects. To adapt the machine for this particular purpose—namely, as a tool-sharpener—I preferably form the grinding wheel or head 43 of a plurality of elements, and in the preferred construction shown in the drawings the said grinding-wheel includes an emery-disk 44, a sandstone block 45, and an extra stone disk 46, arranged upon the same shaft or arbor 15. To secure these several elements of the grinding-wheel in place, a portion of the shaft or arbor 15 is threaded, as at 47, and the emery-disk 44 and sandstone block 45 are placed side by side, while the extra stone disk 46 is spaced from the block 45 and is interposed between the holding-nut 48 and bolt-screw 49, engaging with the shaft or arbor 47, the nut 48 serving to clamp the emery-disk and sandstone block in place and the bolt-screw 49 to hold the extra stone disk in proper working position. In the use of the machine for grinding tools the emery-disk is employed for rough grinding and the sharpening is finished on the sandstone block 45, while for special kinds of tools, especially those of a concavo-convex type, the extra stone disk 46 may be brought into play.

Changes in the form, proportion, size, and the minor details of construction within the scope of the appended claims may be resorted to without departing from the spirit or sacrificing any of the advantages of this invention.

Having thus described the invention, what I claim is—

1. The combination with a turning-lathe, of a longitudinally and laterally adjustable main frame located at right angles thereto at one side of the usual cone-pulley of the lathe, of an auxiliary frame carried by the main frame for adjustment, and a shaft supported by said main frame and provided with a driving member and with a grinding-wheel, the driving member being carried into or out of contact with the cone-pulley, substantially as described.

2. The combination with a turning-lathe, of a longitudinally and laterally adjustable main frame located at right angles thereto at one side of the usual cone-pulley of the lathe, of an auxiliary frame adjustably connected with the main frame, a shaft sustained by the auxiliary frame and provided with a driving-wheel and with a grinding-wheel, the former being carried into or out of contact with the cone-pulley, an arm connected with the auxiliary frame, and locking means on the main frame for engaging said arm, substantially as described.

3. The combination with a longitudinally and laterally adjustable main frame, of an auxiliary frame adjustably connected with the main frame and provided with a shaft, a driving member carried by said shaft, a grinding device on said shaft, a curved arm secured to the auxiliary frame, a locking-plate located to engage said curved arm, and means for securing said locking-plate in place, substantially as described.

4. The combination with a longitudinally and laterally adjustable main frame, of an auxiliary frame, a pivot-bolt connecting said main and auxiliary frames, a shaft carried by the auxiliary frame and provided with a driving-wheel and with a grinding-wheel, an arm secured to the auxiliary frame, a nut on said pivot-bolt, and a locking-plate fitting against said arm and having a bolt-opening to receive said bolt, and operable by the nut, substantially as described.

5. The combination with a base-piece, of a shaft supported thereby, a main frame movable on said shaft as a fulcrum and slidingly carried thereby, an auxiliary frame adjustably connected with the main frame, and a shaft carried by said auxiliary frame and provided with a driving-wheel and with a grinding-wheel, substantially as described.

6. The combination with a base-piece, of a longitudinal shaft supported by the base-piece, a main frame transversely movable upon the shaft, and also movable upon said shaft as a fulcrum, an auxiliary frame adjustably connected with the main frame, a locking tongue or strip provided with a projection for engaging said base-piece, a locking-bolt connected with said strip or tongue and extending through a longitudinal slot in the main frame, and a shaft supported by the auxiliary frame and provided with a driving-wheel and with a grinding-wheel, substantially as described.

7. The combination with a base-piece, of a longitudinal shaft supported by the base-piece, a main frame transversely movable upon the shaft and also movable upon said shaft as a fulcrum, an auxiliary frame adjustably connected with the main frame, a locking tongue or strip having a projection for engaging said base-piece, a locking-bolt connected with said strip or tongue and extending through a longitudinal slot in the main frame, a shaft supported by the auxiliary frame and provided with a driving-wheel and

with a grinding-wheel, and a bolt passing through said longitudinal slot and located between said first-mentioned bolt and said tongue, substantially as described.

8. The combination with a base-piece, of a longitudinal shaft supported by the base-piece, a main frame transversely movable upon the shaft and also movable upon said shaft as a fulcrum, an auxiliary frame adjustably connected with the main frame, a locking tongue or strip having a projection for engaging said base-piece, a locking-bolt connected with said strip or tongue and extending through a longitudinal slot in the main frame, a shaft supported by the auxiliary frame and provided with a driving-wheel and with a grinding-wheel, a bolt passing through said longitudinal slot and located between said first-mentioned bolt and said tongue, a curved arm secured to the auxiliary frame, a locking-plate adapted to engage said curved arm, and means for operating the locking-plate, substantially as described.

9. The combination with a laterally and longitudinally adjustable main frame and with a fulcrum supporting the same, of an adjustable auxiliary frame connected to one end of the main frame, means for raising and lowering the opposite end of said main frame, and a shaft carried by the adjustable auxiliary frame, and provided with a shaft carrying a driving-wheel and a grinding-wheel, substantially as described.

10. The combination with a main frame and with an auxiliary frame adjustably connected therewith at one end, a fulcrum for supporting said main frame, and a cam-lever carried by said main frame at a point beyond said fulcrum, substantially as described.

11. In combination with a turning-lathe, the grinding attachment mounted on the frame of the lathe at right angles to the cone-pulley thereof, and adjustable both laterally and longitudinally along the frame, and a shaft carried by the inner end of the attachment adjacent to the cone-pulley, said shaft being provided with a driving member which receives motion from the said pulley and a grinding-wheel, substantially as described.

12. The combination with a main frame and with an auxiliary frame adjustably connected with the main frame and provided with a shaft carrying a driving-wheel and a grinding-wheel, a fulcrum upon which the main frame is supported for sliding movement, and means for lifting the main frame at a point beyond the auxiliary frame and said fulcrum, substantially as described.

13. The combination with a main frame and with a fulcrum upon which the same is mounted, said main frame having at one end a series of alined openings, an auxiliary frame adjustably connected to the opposite end of said main frame and provided with a shaft carrying a driving-wheel and a grinding-wheel, a pivot adapted to be inserted in two of said alined openings, and an adjusting-lever having a bearing adapted to receive said pivot, substantially as described.

14. The combination with a main frame having a pivot at one end, a bearing adapted to receive said pivot, a lever adjustably connected with said bearing and having a cam end, a fulcrum sustaining the main frame, and an adjustable auxiliary frame connected with the main frame at a point remote from said cam-lever and provided with a shaft carrying a driving-wheel and a grinding-wheel, substantially as described.

In testimony that I claim the foregoing as my own I have hereto affixed my signature in the presence of two witnesses.

GEORGE DIAZ.

Witnesses:
JOSÉ M. CUETTAR,
LOUIS ENHONSE.