(No Model.) 2 Sheets—Sheet 1.

C. N. MORRIS.

GRINDING AND GRAINING DEVICE.

No. 279,001. Patented June 5, 1883.

Fig. 1.

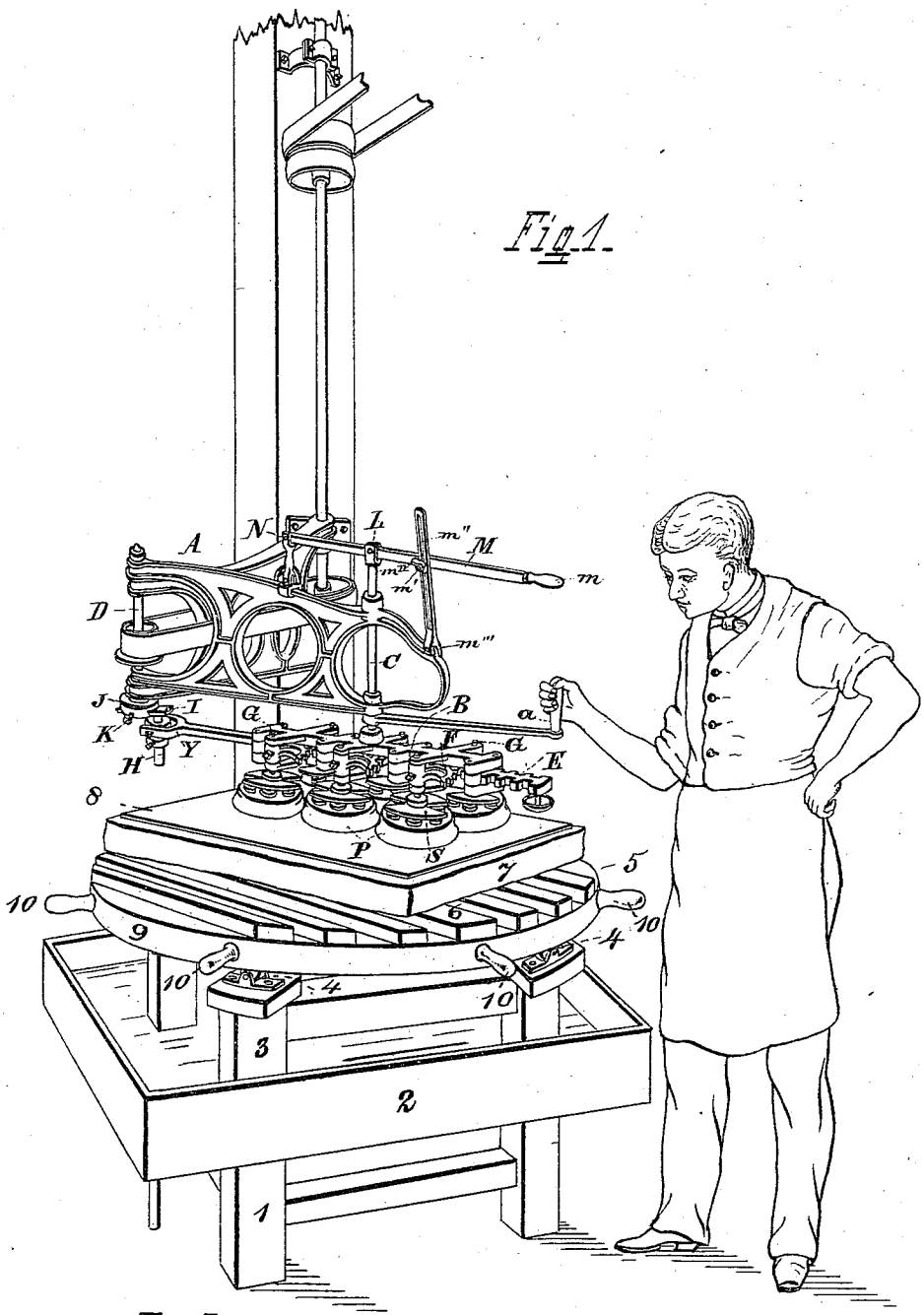
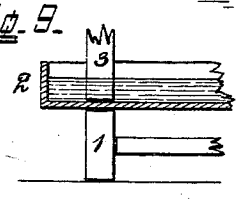


Fig. 2.



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Fig. 3.

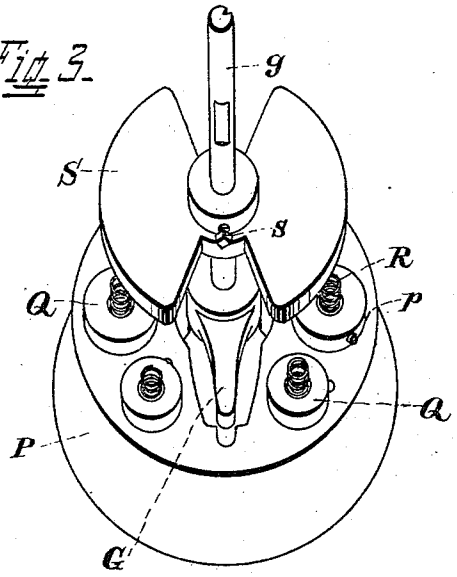


Fig. 4.

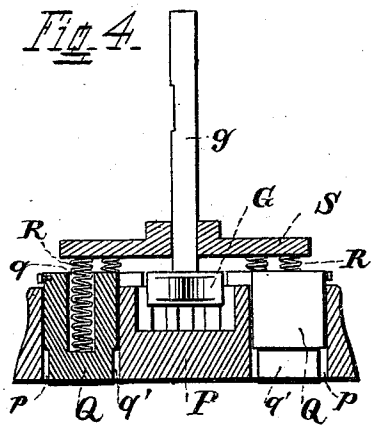


Fig. 7.

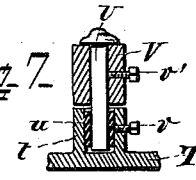


Fig. 5.

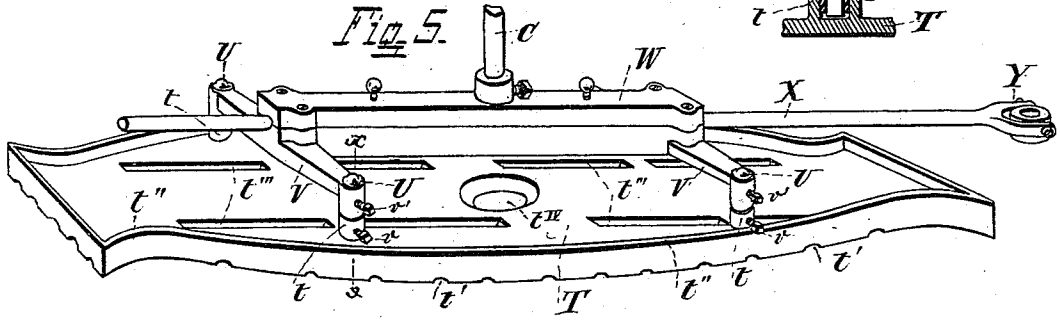


Fig. 6.

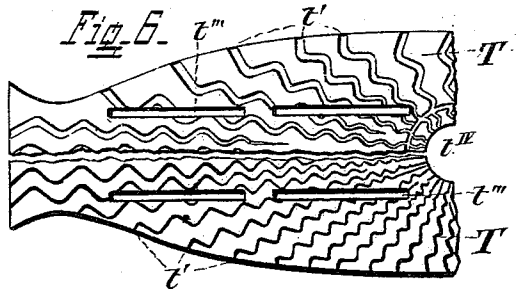


Fig. 8.

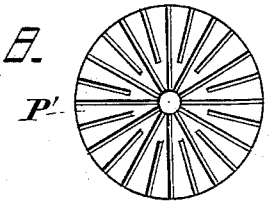
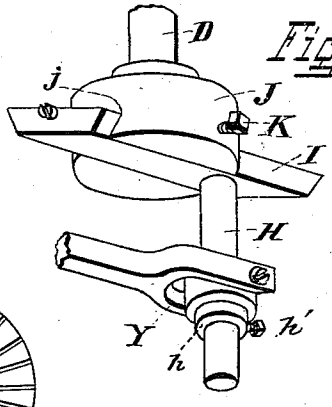


Fig. 2.



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UNITED STATES PATENT OFFICE.

CHARLES N. MORRIS, OF CINCINNATI, OHIO.

GRINDING AND GRAINING DEVICE.

SPECIFICATION forming part of Letters Patent No. 279,001, dated June 5, 1883.

Application filed January 27, 1883. (No model.)

To all whom it may concern:

Be it known that I, CHARLES N. MORRIS, of Cincinnati, Hamilton county, Ohio, have invented a new and useful Improvement in Grinding and Graining Devices, of which the following is a specification.

My invention relates to improvements in the class of grinding and graining mechanism illustrated in subject-matter of my Patents No. 236,824, of January 18, 1881, and No. 253,086, of January 31, 1882, to which reference may be made for more specific description of devices which they possess in common.

My present improvements aim at extending the usefulness of such machines—as, for example, by the provision of a leveling or grinding attachment, and a provision for insuring the graining of the depressed portions equally with the more elevated portions of an uneven zincographic plate without producing unequal thicknesses in the plate.

Other improvements in the details of my machine are explained in the sequel.

In the accompanying drawings, Figure 1 is a perspective view of a machine embodying certain of my improvements. Fig. 2 is an under side perspective view of my adjustable crank-wrist. Fig. 3 is a perspective view, and Fig. 4 a vertical section, of my improved grainer. Fig. 5 is a perspective view, and Fig. 6 a partial under side view, of my grinder or leveler, two slightly-different widths of corrugations being shown. Fig. 7 is a section on line *x x*. Fig. 8 is an under side view of a simple form of grinder or grainer which for level plates or stones may be substituted for an equal number of the grainers shown in Figs. 1, 3, and 4. Fig. 9 is a vertical section through a portion of the stand and catch-box.

The hinged crane A, with its handle *a*, the suspended frame B, its stem C, the shaft D, oscillating rack E, segments F, and oscillating drivers G, with their several adjuncts, may be substantially as set forth in one or other of my aforesaid patents, and require no specific description.

In my present machine the crank-wrist H projects from an adjustable plate, I, that fits and occupies a dovetail groove, *j*, in foot J of the crank-shaft D. This plate, being set so as to give the wrist its desired sweep, is secured to such adjustment by means of a set-screw, K. By this means any desired stroke and oscillation can be given to the rack E. The wrist H is purposely made of considerable length, as represented, in order to enable the machine to be used at diverse working-levels.

My stem C is preferably secured by pivot L to a lever, M, whose rear end is pivoted to a pedestal, N, that rises from the outer crane-leaf. Said lever terminates in a handle, *m*, convenient to the operator, and has a stud, *m'*, which, passing through a slotted rest, *m''*, that is secured by hinge *m'''* to the crane-leaf, takes a thumb-nut, m^{iv}, which, being screwed home, operates to retain the stem C and its attached frame B to any desired distance above the work.

A form of grainer adapted for use with uneven or "buckled" plates is shown in Figs. 1, 3, and 4. In this form the body P of the grainer has a series of vertical orifices, *p*, for reception of plungers Q, which may be of the same material as the body. A cavity, *q*, in each plunger may hold a helical spring, R, to receive any desired downward pressure from a follower, S, which can be secured to any height upon the driver-stem *g* by means of a set-screw, *s*. The said plungers are at their lower portions, *q'*, made of somewhat less diameter than the inclosing-orifices, in order to allow of the return of the work of any particles of abradent that may ascend the interstices. The illustration shows a grainer containing six such plungers; but it is manifest that grainers of greater or smaller size may be made to contain a greater or less number of such plungers to suit any special work. For some purposes my grainers have the desired pressure of the individual plungers secured by giving them greater weight, either by increasing their height or by making them of a heavier material, or both, the springs and follower being then either employed as auxiliary to the plunger-weight or omitted altogether.

For the purpose of leveling the face of a lithographic stone, I provide a plate, T, which may be of cast-iron, and may have several—say four—sockets, *t*, for pins U, that depend from frame V, whose box W embraces a cylin-

drical rod, X, terminating in a gimbal, Y, which, after removal of the grainers and grainer-frame, is secured to the crank-wrist of the graining apparatus. The gimbal Y is upheld at any desired height on wrist H by means of adjustable collar *h*, which is held by set-screw *h'*. It will be seen that the action of the said wrist will be to oscillate the plate about the stem as an axis, while the operator, by means of handle *a*, shifts the plate about the work at his discretion. Zigzag, undulating, or other formed furrows, *t'*, in the plate-sole enable the sand or other abradent to operate efficiently. A curb, *t''*, prevents the escape of abradent deposited upon the plate T, and orifices *t'''* enable the feeding down of abradent to the work in quantities desired. A central orifice, t^{iv}, in the plate affords means of feeding in sand and water, and prevents the imprisonment of abradent at the part of least motion, which, without such opening, is liable to accumulate at this part and interfere with the operator. A rubber sleeve, *u*, introduced in the interstice between the socket *t* and the pins U, and set-screws *v v'*, may respectively hold the pins to the frame and prevent any sudden separation of the plate from the driver. The gimbal-joint Y enables the rod X to assume any inclination without imposing any strain upon the crank-wrist.

The action of my grinding-plate is to produce a perfectly plane or level surface without tendency to create a central depression, which is the case with the ordinary hand-grinders. The plate may be of the represented or of any preferred contour.

For light grinding operations or limited surfaces, I may employ a grooved mass such as shown by under side view at P', Fig. 8, and the orifices and plungers and follower may otherwise be constructed precisely as shown in Figs. 3 and 4.

The preferred form of rest is shown in Fig. 1, and consists of a base, 1, upon which the catch-box 2 is placed, which in turn supports the stand 3, surmounted by rollers 4, that uphold a circular turn-table, 5, whose grooved or slatted top 6 supports the slab 7, which may be a lithographic stone to be operated upon, or which may simply afford a level rest for the zincographic plate 8. A curb, 9, which surrounds the turn-table, serves the twofold purpose of protecting the rollers from the droppings of the work and of holding the table in place upon the rollers. Handles 10 enable the attendant to turn the table and superincumbent work to any desired position.

I claim as new and of my invention—

1. For use in preparing the surfaces of plates for zincographic or lithographic purposes, the grinder or grainer composed of body P, having orifices *p*, containing plungers Q, which are adapted to press independently upon the work, substantially as and for the purpose set forth.

2. For use in a graining or grinding machine, the grainer composed of body P, whose orifices *p* contain plungers Q, having springs R, in combination with the driver G, to which a follower, S, is secured, of any desired height, by means of a set-screw, *s*, substantially as and for the purpose set forth.

3. In a grainer, P, the plunger Q, occupying orifices *p*, and having their lower portions of reduced diameter, for the purposes explained.

4. In a grinding and graining machine, the combination, with hinged crane A and suspended frame B, of the stem C, adjustable in elevation by means of lever M, stud *m'*, rest *m''*, and nut m^{iv}.

5. The grinding and leveling plate or disk consisting of casting T, having sockets *t*, grooved or rounded sole *t'*, curb *t''*, and feed-holes *t'''* t^{iv}, in combination with the frame V, having pins U, and the box W to engage on oscillating rod X, substantially as set forth.

6. The combination of base 1, catch-box 2, and stand 3, surmounted by rollers 4, supporting turn-table 5, having the grooved or slatted top 6 and curb 9, as and for the purposes set forth.

In testimony of which invention I hereunto set my hand.

CHAS. N. MORRIS.

Attest:

GEO. H. KNIGHT,
S. S. CARPENTER.