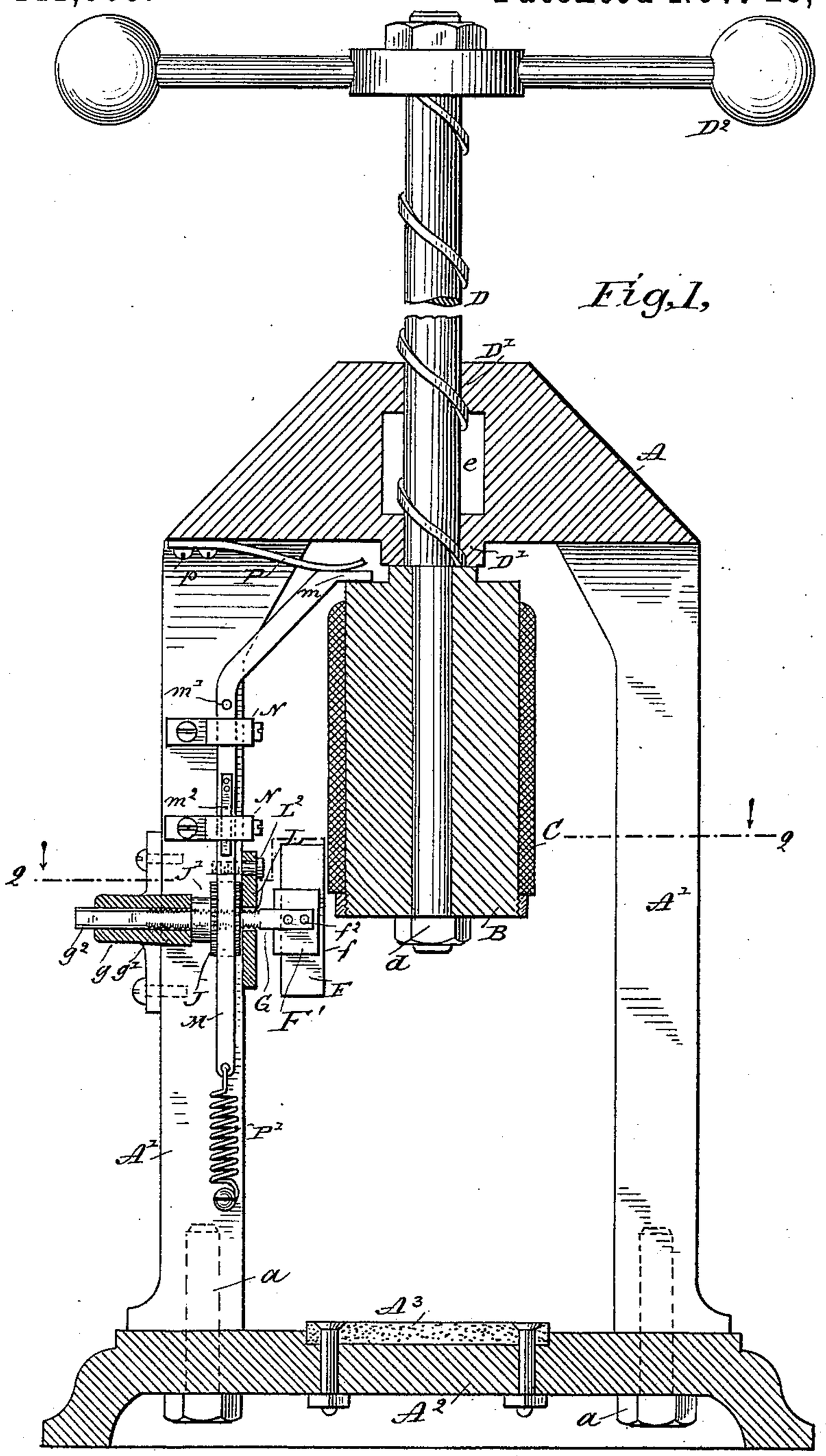
(No Model.) 3 Sheets—Sheet 1.

G. A. BEACH.

MACHINE FOR PARING AND POLISHING PHONOGRAPH CYLINDERS.

No. 441,609. Patented Nov. 25, 1890.



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(No Model.) 3 Sheets—Sheet 2.

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MACHINE FOR PARING AND POLISHING PHONOGRAPH CYLINDERS.

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Fig. 2.

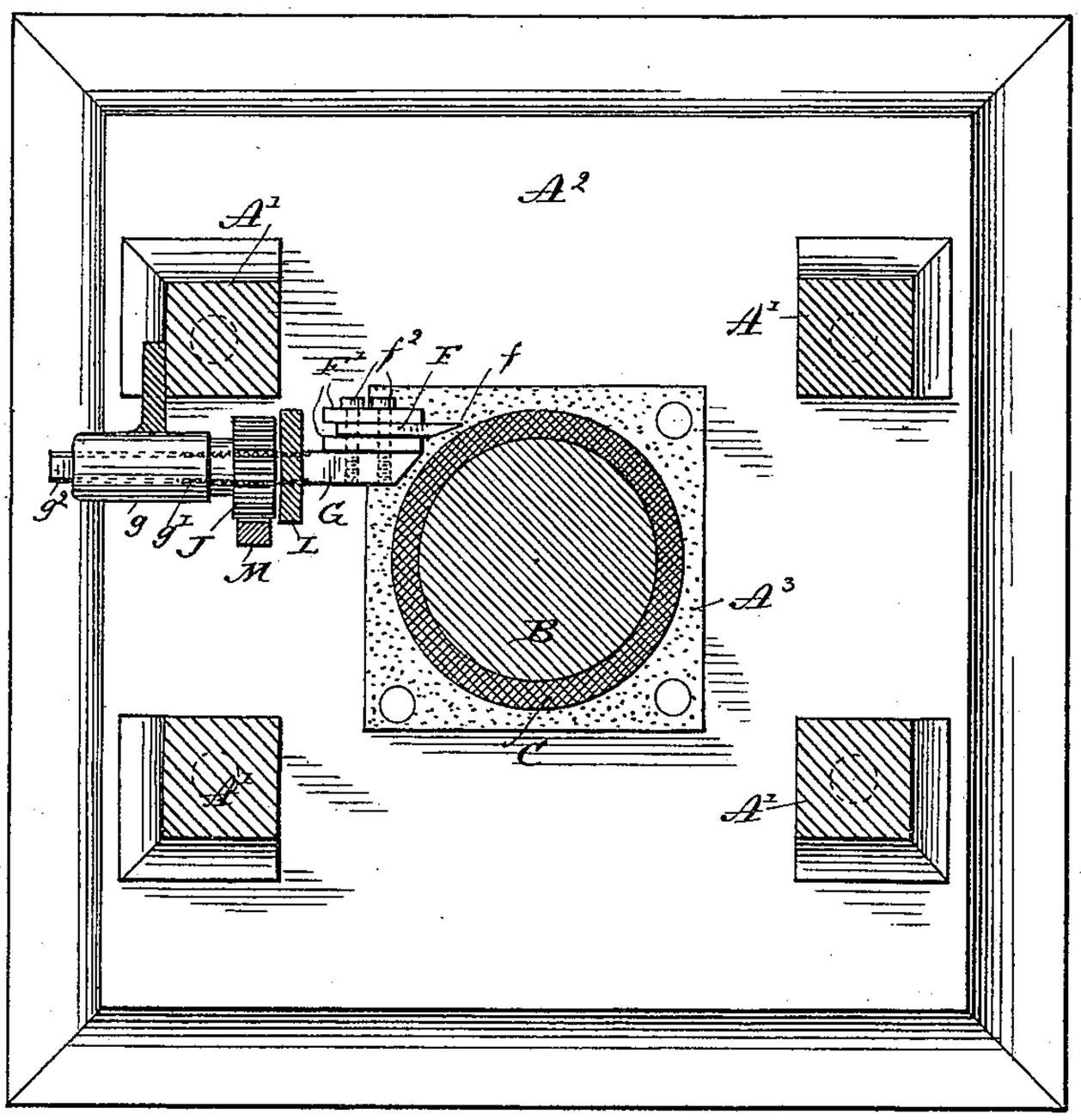


Fig. 3,

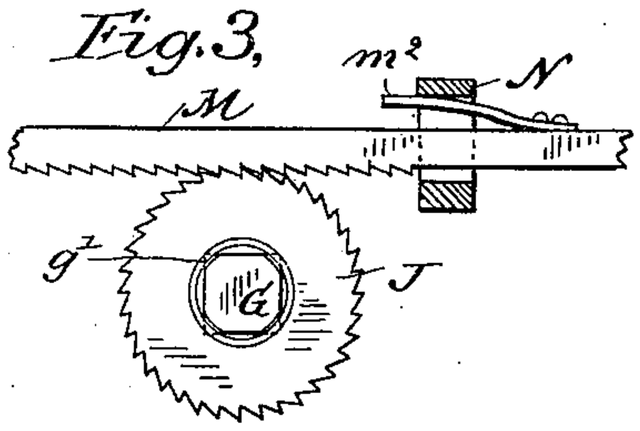


Fig. 4,

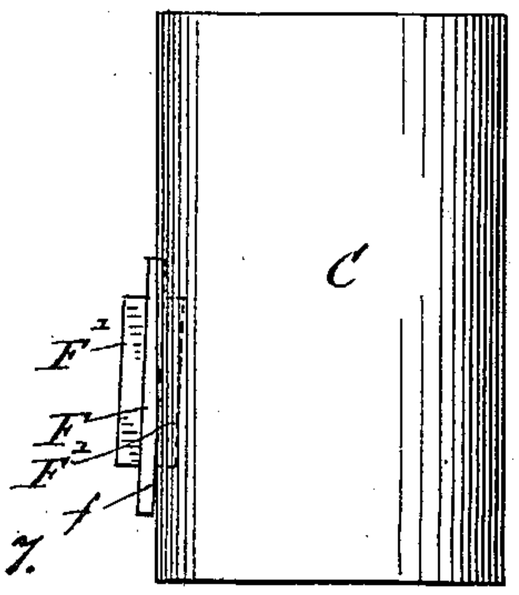


Fig. 5.

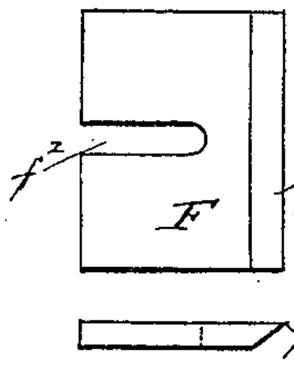


Fig. 6.

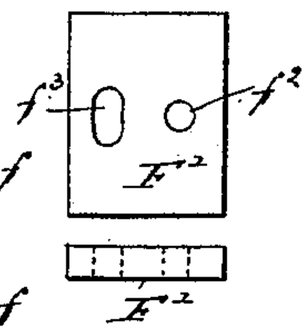


Fig. 7.

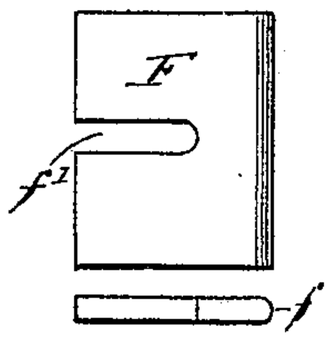
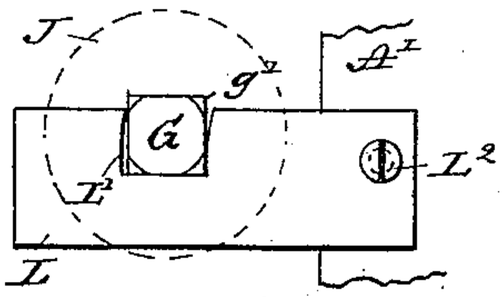


Fig. 8.



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(No Model.) 3 Sheets—Sheet 3.

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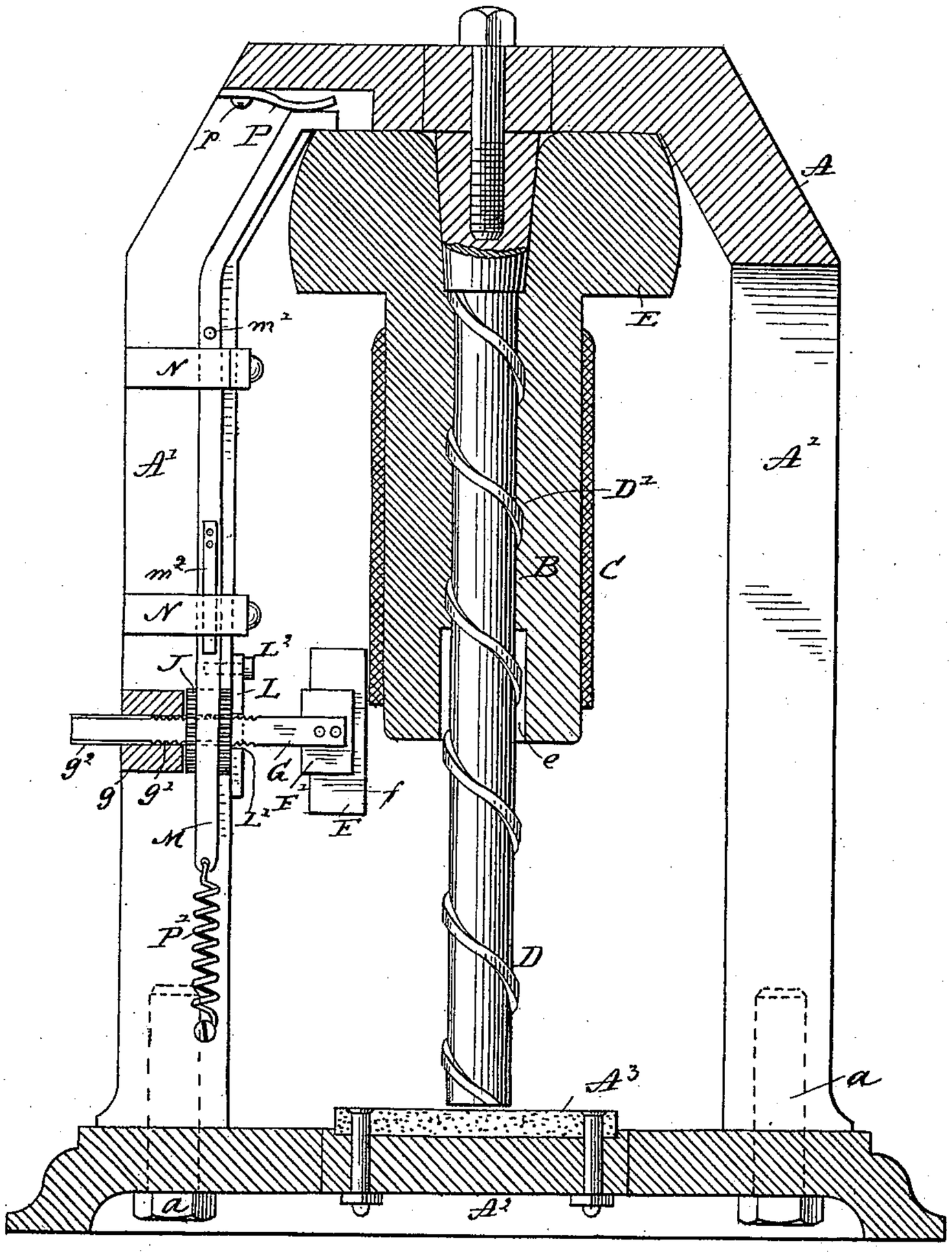
MACHINE FOR PARING AND POLISHING PHONOGRAPH CYLINDERS.

No. 441,609. Patented Nov. 25, 1890.

Fig. 9.



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UNITED STATES PATENT OFFICE.

GEORGE A. BEACH, OF SIOUX CITY, IOWA, ASSIGNOR OF ONE-FOURTH TO CHARLES DICKINSON, OF CHICAGO, ILLINOIS.

MACHINE FOR PARING AND POLISHING PHONOGRAPH-CYLINDERS.

SPECIFICATION forming part of Letters Patent No. 441,609, dated November 25, 1890.

Application filed June 16, 1890. Serial No. 355,524. (No model.)

To all whom it may concern:

Be it known that I, GEORGE A. BEACH, a citizen of the United States, residing in Sioux City, in the county of Woodbury and State of Iowa, have invented a new and useful Improvement in Machines for Paring and Polishing Phonograph-Cylinders, of which the following is a specification.

My invention relates to machines or devices for paring or polishing phonograph or graphophone cylinders.

Heretofore phonograph-cylinders have usually been pared and polished by an attachment to the phonograph-machine itself; but this method is objectionable on account of the dust or parings getting into or upon the phonograph mechanism and interfering with its operation, and also because of the delay and time required where the paring is done by the feed mechanism of the phonograph itself.

The object of my invention is to provide a mechanism of a simple, efficient, and durable character by which the phonograph or graphophone cylinders may be rapidly and cheaply pared and polished.

My invention consists in a revolving holder for receiving and holding the phonograph-cylinder, furnished with a feed-screw and nut for giving the requisite feed or longitudinal movement to the wax cylinder as it revolves in combination with a paring or polishing tool. To prevent the corner or edge of the paring knife or tool from tearing, breaking, or gouging the surface of the cylinder, I so combine the knife with the axis of the cylinder or its holder that its edge makes a slight inclination therewith, so that the extreme ends of the knife will not touch the cylinder at all, or if at all cut very slightly. By this means I prevent scratching or marring the cylinder by the corners or end of the knife-blade, and though the shaving cut by the middle portion of the knife be slightly deeper than that cut by the end portions of the knife this slight swell or curve given to the surface of the wax cylinder will not in any way, I find, interfere with the proper operation of the phonograph or graphophone, as the needle or engraving-point of the phonograph can by its spring or yielding movement compensate for any such swell or curvature in the surface of the cylinder. To further prevent chipping of the wax cylinder, I combine the knife with the cylinder or its holder, so that the knife strikes the cylinder at an inclination to its surface, the arrangement of the knife being, preferably, nearly tangential to the surface of the cylinder to be pared.

The invention further consists in the particular means of combining the revolving holder and its shaft with the support or frame in which it is mounted, so that the gravity of the cylinder, supplemented by a weight when desired, may be utilized as the force or power for doing the work.

It further consists, in connection with the revolving holder, feed-screw, and knife, of automatic mechanism for adjusting or feeding the knife after each shaving is cut from the cylinder preparatory to the succeeding operation.

It further consists in the novel devices and novel combinations of parts and devices herein shown and described, and more particularly pointed out in the claims.

In the accompanying drawings, which form a part of this specification, and in which similar letters of reference indicate like parts, Figure 1 is a vertical sectional view of a device embodying my invention. Fig. 2 is a section taken on line 2 2 of Fig. 1. Fig. 3 is a detail elevation of the mechanism for feeding or adjusting the knife. Fig. 4 is a detail view of the cylinder and knife, showing the inclination of the latter to the former. Fig. 5 is a detail view of the knife. Fig. 6 is a detail view of one of the knife-holder plates. Fig. 7 is a detail view of the polishing-tool which is substituted for the knife during the polishing operation. Fig. 8 is a detail view of the cap or plate for holding the knife feed-gear in place. Fig. 9 represents a modification in which the screw is fixed rigidly to the frame and in which the threaded nut is made integral with the reciprocating holder upon which the wax cylinder is secured.

In the drawings, A represents the frame of the machine, which may preferably consist of two upright supports A′ A′, secured by screws

a to base-plate A^2. The base-plate is or should be furnished with a rubber or other yielding pad A^3 to prevent jars or injury to the phonograph-cylinder as its holder descends.

B represents the revolving and reciprocating holder upon which the wax phonograph-cylinder C is secured. The holder B may be of any suitable form or construction adapted to receive and hold the phonograph-cylinder. Where the phonograph-cylinder is made of wax and adapted for frequent parings, the holder B should be a counterpart of the wax-cylinder holder upon the phonograph-machine.

D represents the feed-screw and D′ its threaded nut. Preferably the nut is fixed in or to or made integral with the frame A, and the screw is secured to the revolving holder B. The screw, however, may be, as shown in Fig. 8, fixed rigidly to the frame, and the threaded nut be secured to or made integral with the holder B. The threads constituting the nut D′ may preferably be cut in the frame A itself or in the holder B, as shown in Fig. 8. The screw D may be secured to the holder B by a threaded nut *d*. To diminish the friction between the screw D and its nut a portion of the frame B may be cut out, as shown at *d*. The pitch of the threads of the screw and nut may preferably be such that the weight of the holder and screw, supplemented, if necessary, by a weight E, will suffice to cause the holder to revolve as it descends by its own gravity. The weight D^2 may preferably be made in the form of a hand-wheel, like that, for example, of an ordinary letter-press. By giving this wheel a quick revolving impulse also, its momentum will serve to cause the wax-cylinder holder to descend and revolve to the extent necessary for one complete paring or polishing operation.

F represents the dressing-tool. This tool may be either a knife or paring-tool, as shown in Fig. 1, or a polishing-tool, as shown in Fig. 6. The knife or paring-tool F is furnished with a chisel-shaped straight edge *f* and with a slot or notch *f′*, through which the screws or bolts f^2 pass, by which it is adjustably secured in its holder F′. The holder F′ consists, preferably, of two flat plates secured to a screw-bar G by the bolts f^2, the plates F′ having a slot f^3 for one of the bolts f^2 to pass through to permit the adjustment of the plates. The bar G is preferably square and fits in a square socket or guide *g* in the frame of the machine. The corners of this square bar are furnished with screw-threads *g′* to receive the gear-nut J. The corners g^2 of the knife-holder bar G are removed to permit them to pass freely through the screw-threaded gear J. A portion of the bar G is thus left smooth, so as to fit snugly in its guideway or socket, while a portion of it is threaded to receive the gear-nut. The gear-nut J fits in a pocket or recess J′ in the frame and is held in place by a cap or plate L, having a notch L′ to receive the bar G and a screw or bolt L^2 to hold it in place. By simply loosening the screw L^2 the plate L may be swung on the screw as a pivot and the knife F, its holder-bar G, and nut J may be all thus removed bodily. This is a matter of convenience when the knife requires sharpening or dressing.

The screw-threaded knife-holder bar G is automatically operated by a rack-bar M, having an arm or projection *m*, against which the holder B or some part attached thereto or moving therewith impinges. The rack-bar M slides up and down in suitable guides N N′ on the frame of the machine. After each impulse it is returned to place by a spring P, secured by screws *p* to the frame of the machine. A pin or projection *m′* on the bar M, striking against the guide N′, limits the movements of the rack-bar. To permit the rack-bar to be bent or pulled out of engagement with the gear J when it is desired to turn the gear by hand for the purpose of adjusting the position of the knife to or from the wax cylinder, the lower guide N is made to fit loosely and the bar M is provided with a flat spring m^2, which serves to press the rack-bar against the gear, and a spring P′ is also furnished at the lower end of the rack-bar. The teeth on the gear J and on the rack-bar M are made of a ratchet form, so that the rack-bar will only operate to turn the gear in one direction. The movement of the rack-bar M is so adjusted or proportioned in relation to the gear J and screw-threads on the knife-holder bar that after each successive paring or polishing operation the knife will be automatically moved in toward the cylinder just the amount necessary for the next shaving.

The operation of the device is as follows: The cylinder to be pared or polished being placed in or upon the holder B, the holder is raised to its uppermost position, when the rack-bar N will be reciprocated, thus causing the knife-holder bar G to be fed inward toward the wax cylinder. The holder B is then caused to descend and revolve, either by gravity or otherwise, and as it descends and revolves the knife F will pare the cylinder to the required depth. It will be observed that the length of the knife or polishing-tool is somewhat greater than the distance between the threads of the screw, so that the whole length of the knife will not be required to touch or cut the cylinder in order to pare its whole surface. I am thus enabled to incline the edge of the knife slightly to the axis of the cylinder and prevent any tendency to break or tear the wax by the corners of the knife, as the exterior corners of the knife will not touch or cut the cylinder at all.

I claim—

1. In a phonograph or graphophone cylinder paring machine, the combination, with a revolving and reciprocating holder for the

phonograph-cylinder, of a paring-knife having its edge set at a slight angle to the axis of the cylinder, substantially as specified.

2. The combination, with the revolving and reciprocating phonograph or graphophone cylinder holder, of a paring-knife having a chisel-shaped edge set and arranged at an inclination to the surface of the cylinder to be pared, substantially as specified.

3. The combination, with the revolving and reciprocating phonograph or graphophone cylinder holder, of a paring-knife having an edge, the ends or corners of which do not touch or engage the cylinder during the paring operation, whereby the tearing or chipping of the wax is prevented, substantially as specified.

4. In a phonograph or graphophone cylinder paring machine, the combination, with a revolving and reciprocating holder, of a knife arranged and adapted to pare the surface of the cylinder, with a slight swell or curvature therein, substantially as specified.

5. In a phonograph or graphophone cylinder paring machine, the combination of a suitable frame or support with a revolving and reciprocating cylinder-holder, and a screw-threaded shaft and nut for simultaneously revolving and reciprocating said holder and a dressing-tool, substantially as specified.

6. In a phonograph or graphophone cylinder paring machine, the combination of a suitable frame or support with a revolving and reciprocating cylinder-holder, and a screw-threaded shaft and nut for simultaneously revolving and reciprocating said holder and a dressing-tool, said screw-threaded shaft and nut being arranged with their axis vertical, so that gravity may be utilized for revolving and reciprocating said cylinder, substantially as specified.

7. In a phonograph or graphophone cylinder paring machine, the combination of a suitable frame or support with a revolving and reciprocating cylinder-holder, and a screw-threaded shaft and nut for simultaneously revolving and reciprocating said holder and a dressing-tool, said screw-threaded shaft and nut being arranged with their axis vertical, so that gravity may be utilized for revolving and reciprocating said cylinder, and a weight for actuating said holder, substantially as specified.

8. In a phonograph or graphophone cylinder paring machine, the combination of a suitable frame or support with a revolving and reciprocating cylinder-holder, and a screw-threaded shaft and nut for simultaneously revolving and reciprocating said holder and a dressing-tool, said screw-threaded shaft and nut being arranged with their axis vertical, so that gravity may be utilized for revolving and reciprocating said cylinder, and a weight for actuating said holder, said weight being in the form of a hand-wheel, substantially as specified.

9. In a phonograph or graphophone cylinder dressing machine, the combination, with a revolving and reciprocating holder, of a dressing-tool and mechanism for automatically adjusting the position of the dressing-tool for each operation, substantially as specified.

10. In a phonograph or graphophone cylinder dressing machine, the combination, with a revolving and reciprocating holder, of a dressing-tool and mechanism for automatically adjusting the position of the dressing-tool for each operation, said mechanism consisting in a screw-threaded tool-holder bar, a gear-nut, and a reciprocating rack-bar, substantially as specified.

11. In a phonograph-polishing machine, the combination, with a frame furnished with an elastic pad, of a revolving and reciprocating phonograph-cylinder holder, said pad serving to prevent injury to the wax cylinder from jars when the holder strikes the same, substantially as specified.

12. The combination, with a revolving and reciprocating holder, of a screw for simultaneously revolving and reciprocating the holder, and a dressing-tool exceeding in length the distance between the contiguous threads on said screw, substantially as specified.

13. In a phonograph-dressing machine, the combination of the frame with revolving and reciprocating holder B, screw D, nut D′, paring-tool F, mounted in an adjustable holder F′, screw-threaded holder-bar G, nut-gear J, ratchet-bar M, having arm *m*, adapted to engage said reciprocating cylinder-holder, and a spring for returning the ratchet-bar to place, substantially as specified.

14. In a phonograph-dressing machine, the combination of the frame with revolving and reciprocating holder B, screw D, nut D′, paring-tool F, mounted in an adjustable holder F′, screw-threaded holder-bar G, nut-gear J, ratchet-bar M, having arm *m*, adapted to engage said reciprocating cylinder-holder, and a spring for returning the ratchet-bar to place, said ratchet-bar having a loose guide N near its lower end and provided with spring m^2, whereby the ratchet-bar is adapted to be lifted out of engagement with its gear, substantially as specified.

15. The combination, with a revolving and reciprocating holder B, of dressing-tool F and its adjustable holder F′, substantially as specified.

16. The combination, with a revolving and reciprocating holder B, of a dressing-tool F, mounted upon a square holder-bar G, having threads cut upon its corners, and a nut-gear J, substantially as specified.

17. The combination, with a revolving and reciprocating holder B, of a dressing-tool F, mounted upon a square holder-bar G, having threads cut upon its corners, and a nut-gear J, said nut-gear being secured in a recess to the frame by a slotted cap L, substantially as specified.

18. The combination, in a phonograph-dressing machine, of a dressing-tool with a revolving and reciprocating holder, and a screw and nut having quick threads for revolving and reciprocating said holder, substantially as specified.

19. The combination, in a phonograph-dressing machine, of a dressing-tool with a revolving and reciprocating holder, and a screw-nut having quick-threads for revolving and reciprocating said holder, said screw and nut having their axes arranged vertically, so that gravity may be utilized for actuating said holder, substantially as specified.

20. The combination of the frame having a guideway therein, of a bar G, fitting in said guideway and having screw-threads cut upon its corners, and a gear-nut threaded upon said bar and secured in a recess in said frame by a removable cap, and a phonograph-dressing tool mounted upon said bar, substantially as specified.

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