

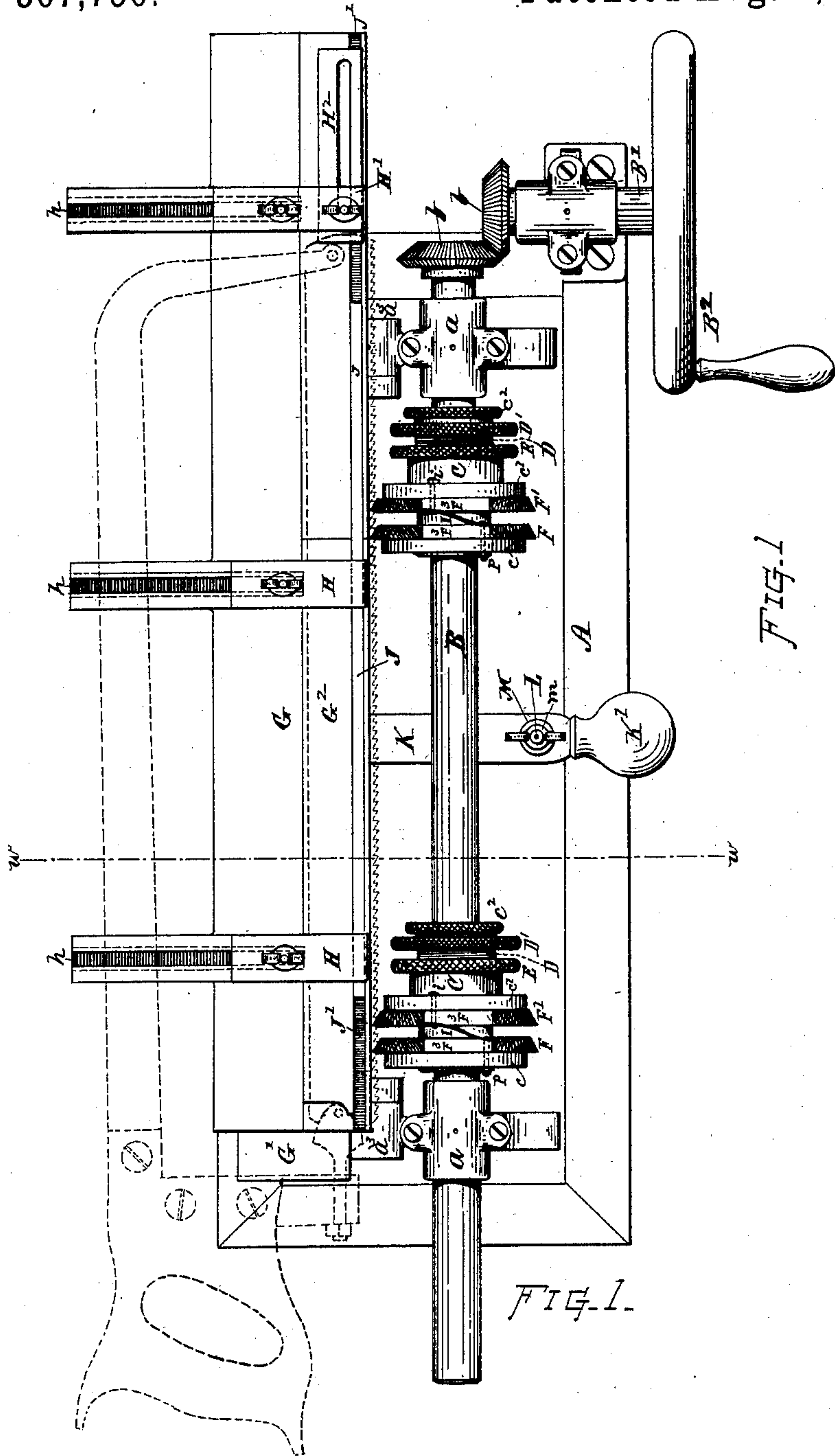
(No Model.)

2 Sheets—Sheet 1.

D. HARRINGTON.
SAW FILING MACHINE.

No. 367,756.

Patented Aug. 2, 1887.



WITNESSES

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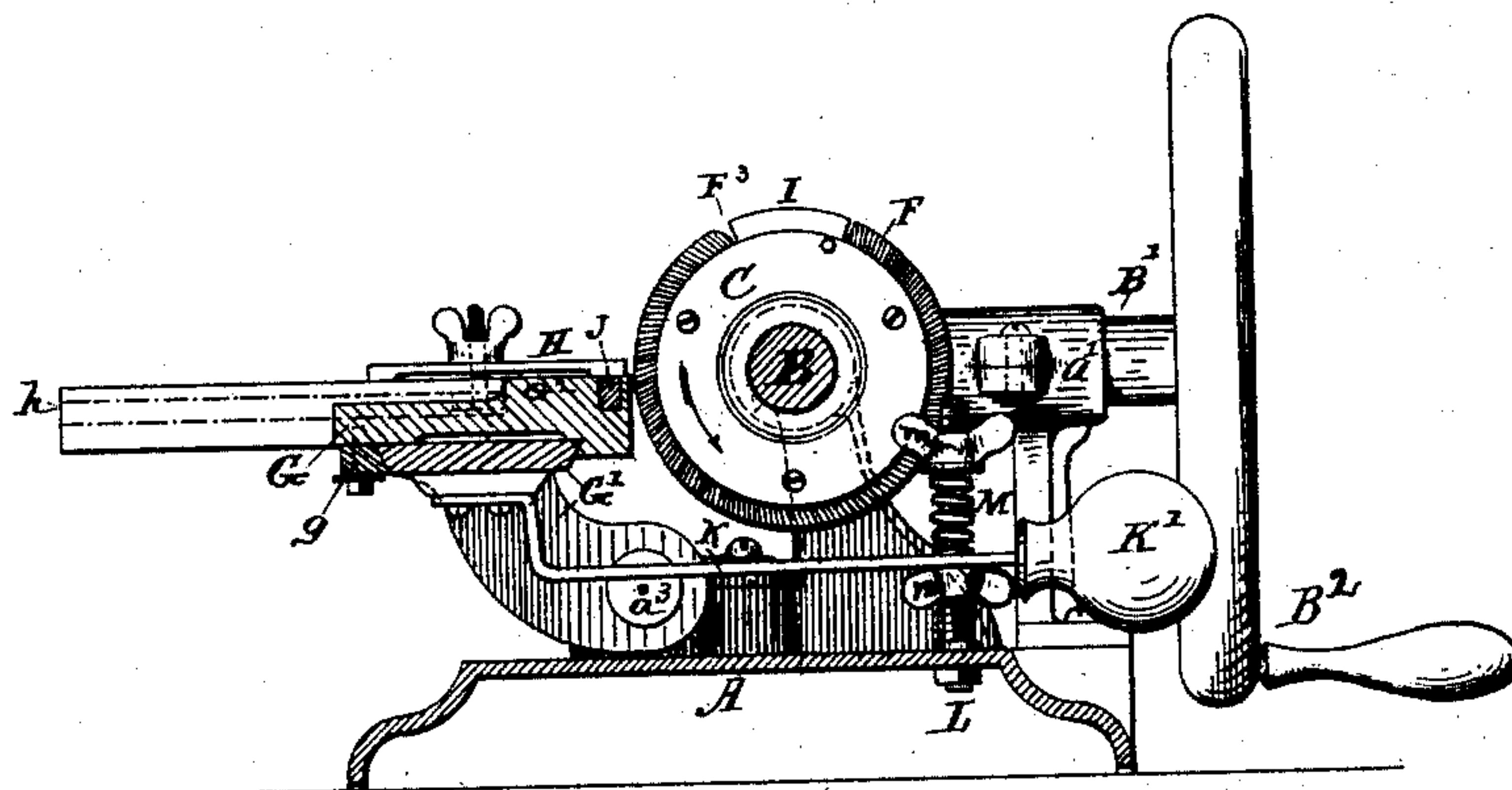


FIG. 2.

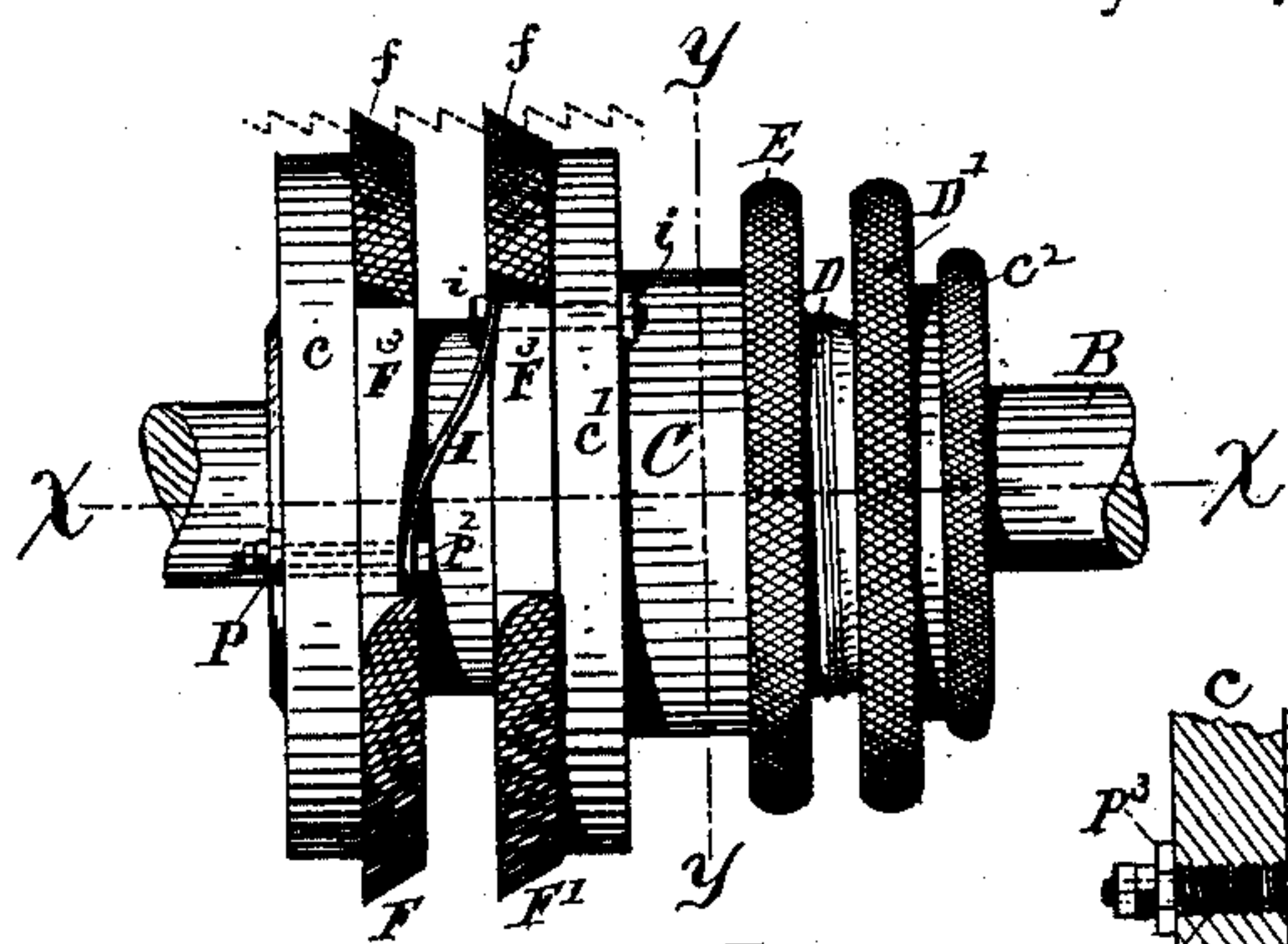


FIG. 3.

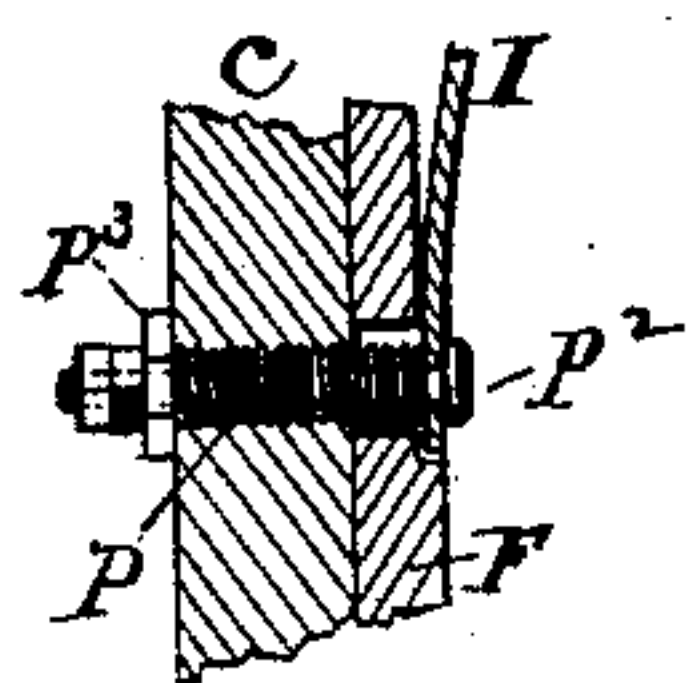


FIG. 7.

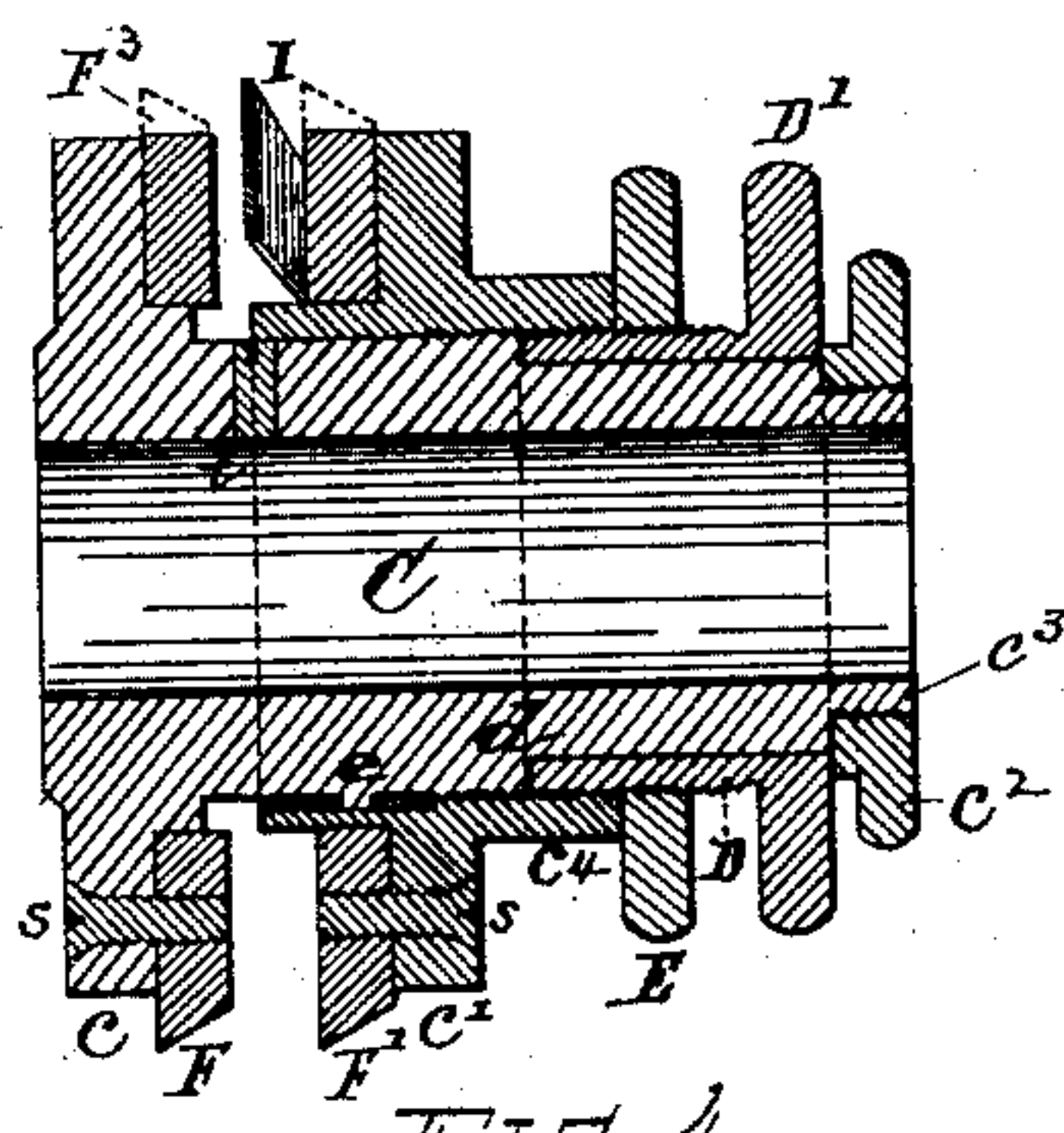


FIG. 4.

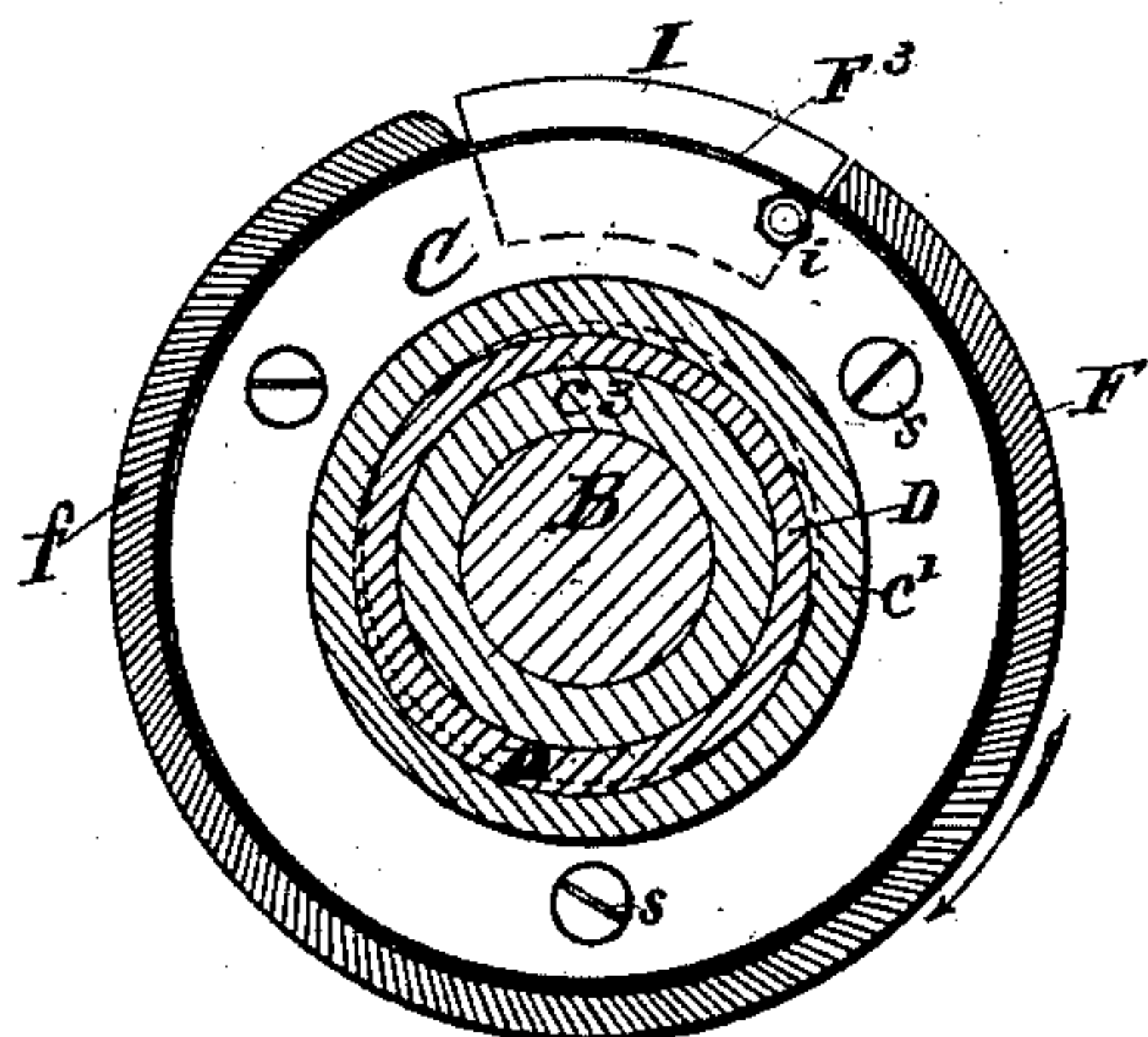


FIG. 5.

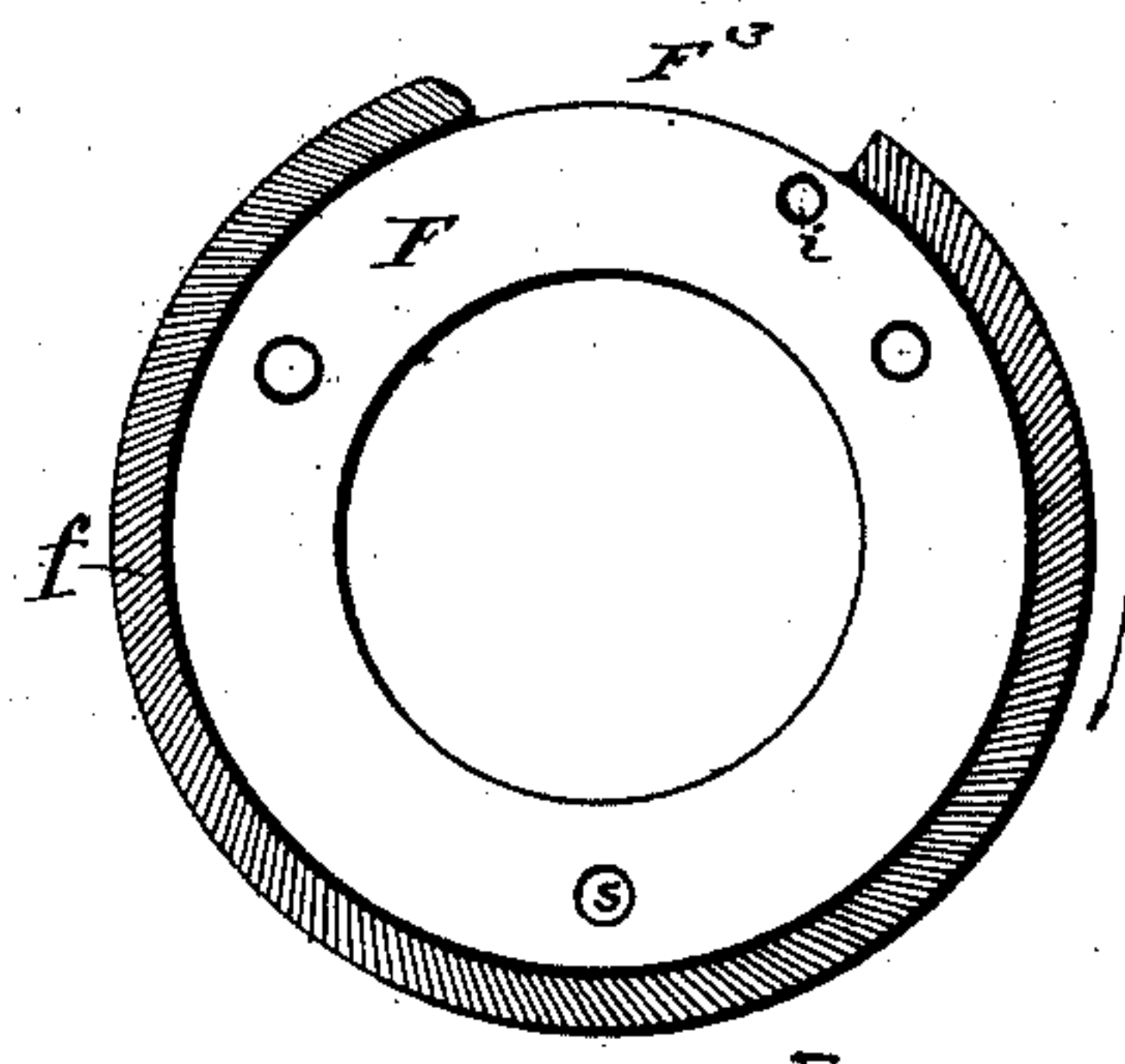


FIG. 6.

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UNITED STATES PATENT OFFICE.

DAVID HARRINGTON, OF WORCESTER, MASSACHUSETTS.

SAW-FILING MACHINE.

SPECIFICATION forming part of Letters Patent No. 367,756, dated August 2, 1887.

Application filed September 22, 1886. Serial No. 214,232. (No model.)

To all whom it may concern:

Be it known that I, DAVID HARRINGTON, a citizen of the United States, residing at Worcester, in the county of Worcester and State of Massachusetts, have invented certain new and useful Improvements in Saw-Filing Machines, of which the following, together with the accompanying drawings, is a specification sufficiently full, clear, and exact to enable persons skilled in the art to which this invention appertains to make and use the same.

The objects of my present invention are to provide an automatic saw-filing mechanism which shall be practical and efficient for use, and which can be conveniently adjusted for different spacings or sizes of teeth; also, to provide a saw-filing machine having a plurality of annular files peripherally recessed to facilitate feeding forward on the work as the saw-teeth are consecutively filed and the said recesses are brought into a laterally-coinciding relation therewith, in combination with an inclined feed-plate and means for adjusting the same to different degrees of inclination for imparting a greater or less movement for the feed; also, to provide a carrier or head for supporting and revolving a pair of circular files having facilities for adjustment to give greater or less distance between the peripheral edges of said files; also, to provide a rocking support or carriage adapted for holding a saw with a yielding pressure, in combination with circular files and means for regulating the action thereof, as more fully hereinafter explained; also, to provide an extensible bed for accommodating saws of different size, in combination with the rocking support or carriage and clamp devices for retaining the saw in place thereon; also, to provide a saw-filing mechanism having a plurality of annular rotating files, a yielding saw-support, with adjusting devices for regulating the action thereof, and a flexible inclined feed device and means for adjusting the same to different degrees of spacing. These objects I attain by mechanism the nature and operation of which are illustrated and explained in the following description, the particular subject-matter claimed being hereinafter definitely specified.

In the drawings, Figure 1 is a plan view of my improved saw-filing machine. Fig. 2 is a transverse vertical section at line *ww* in Fig.

1. Fig. 3 is a top view of the file-supporting head drawn to a somewhat larger scale. Fig. 4 is a longitudinal section of the head at line *xx* in Fig. 3. Fig. 5 is a transverse section of the head at line *yy* in Fig. 3. Fig. 6 is a side view of the annular-file. Fig. 7 is a sectional view showing the detail of the feed-plate-supporting stud.

My improved saw-filing machine comprises a frame or base, on which is arranged a horizontal shaft carrying circular rotary files. At the back of said shaft is a rocking or yielding support or carriage for holding the saw and pressing it forward against the files. An adjustable inclined feed device is combined with the files, which engages with the saw-teeth and feeds along the work as the teeth are filed, and suitable cushioning and gaging devices are combined with the carriage for controlling the pressure and action of the saw against the files.

In referring to parts, A denotes the base or main frame.

B indicates the operating-shaft, on which the file-supporting head or heads C is or are mounted. Said shaft is journaled in horizontal position to turn in bearings *aa*, and in the present instance is, for convenience of operation, connected with a forwardly-projecting shaft, B', that supports the crank and balance wheel B² by beveled gears *bb*, so that the operator standing in front of the machine has the crank in convenient reach of his right hand, the shaft B being disposed to revolve in the direction indicated.

The file is formed as an annular plate or circle, (see Fig. 6,) with its peripheral edge beveled. It is serrated on the beveled surface, as at *f*, and also on the upright face, so as to correspond to the required form of the saw-tooth. This annular file is provided with a recess or space, F³, where the periphery is cut away on a circle of less diameter than the working-diameter of the file, which recess accommodates the feeding of the work, as will be hereinafter more fully explained.

The files are preferably disposed in pairs, as indicated at F and F', in conjunction with a feeding device, and fixed on a suitable carrier or supporting-head, C.

The machine is preferably provided with a plurality of files, or with one or more file-sup-

porting heads on the shaft B, said heads being made with separable rims or adjustable, so that the files and feed-plate can be adjusted for various spacings of teeth. By employing a plurality of files on the shaft, or by using two or more heads each with a pair of annular files in the manner shown, the work can be very quickly performed without speeding the rotation of the shaft beyond the practical working speed for the files.

The file-carrier or head C is made substantially as shown in Figs. 3, 4, and 5. The main part of the head, which is keyed to the shaft B, is provided with a stationary flange or rim, c , to which one of the files, F, is secured, and with an adjustable rim, c' , to which the other file, F', is secured, and means for effecting adjustment of this rim c' to and from the other for varying the distance between the working planes of the files F and F' is provided. The mechanism for effecting adjustment of the head is preferably constructed to operate as follows: A rotatable sleeve, D, having a milled rim, D', is arranged on the main hub c^3 , and longitudinally confined by a shoulder at d and by a nut, c^2 , screwed onto the end of the hub c^3 . The sleeve D is fitted with a screw-thread to the interior of the hub c^4 of the rim c' , which latter is confined by a spline or pin, e , (see Fig. 4,) from revolving independent from the main hub c^3 , so that when the sleeve D is revolved the screw-thread action between the parts D and c' effects the movement of the file F' to or from the file F. A check-nut, E, is provided on the sleeve D, which can be turned up against the hub c^4 for clamping the parts in position of adjustment.

I indicates the feed guide or device for changing the relation of the saw and files from one tooth to another as the work of filing proceeds. Said device consists of a flexible plate of steel or other suitable material, the outer edge of which is curved on a circle corresponding to the periphery of the files, and said plate is secured in a manner to enter between the saw-teeth as the shaft revolves. The forward end of said plate is connected with the movable rim c' of the head, as at i , and the rear end thereof is connected with the stationary rim c by means of an adjustable stud, P. The feed device occupies a position on the circle of the head corresponding to that of the recesses F³, and acts as a diagonal or helicoidal guide between the teeth of the saw for transferring the work longitudinally. The recesses F³ permit the feeding action without requiring the saw to be moved back from filing position.

The saw-supporting mechanism preferably consists of a frame, G', pivoted or hinged to the main frame A, as at a^3 , so that its upper part can rock toward or from the file-supporting shaft B. Upon the top of the frame G' is arranged the sliding bed or carriage G, upon which the saw is secured while being filed. Said carriage is connected with its supporting-

frame G' by dovetailed or undercut guideways. An adjustable gib or bearer, g , may be used to take up any looseness or wear of the guides.

H H' indicate clamps for holding the saw-blade in place on the carriage. The screws of said clamps have their heads locked into undercut channels h , extending crosswise of the carriage, so as to be readily adjusted forward or back, as desired. The clamp H' at the right-hand end of the machine is preferably made with an adjustable extension-bar, H².

The raised bed-surface G² along the front of the carriage is made of a suitable length to accommodate the smaller sizes of saws, and the carriage is longitudinally grooved, as at J', and a sliding bar, J, is fitted in said groove, which serves as an extensible or adjustable bed to accommodate saws of any length above the minimum. The bed-surface and bar J give a bed for the saw-blade, while the back frame lies on the carriage-plate G and the backward-extending arms thereof. The saw is arranged on the carriage as indicated by dotted lines in Fig. 1.

K indicates an arm or lever attached to the rocking carriage-frame and extending toward the front of the machine, where it is provided with a hand-knob, K'. A bolt, L, is fixed in the bed A, which extends up through an opening in said lever, and has adjusting-nuts m and n arranged thereon, one above and one below the arm, and also a spring, M, between the upper nut and top of the arm, which spring serves as a cushion for giving yielding pressure of the saw against the files when the machine is in operation. The nut n serves as a stop for the rocking action of the saw-supporting mechanism, thereby gaging the depth to which the files work in the saw. The tension of the spring is regulated by nut m .

The adjusting-stud by which the feed-plate I is connected to the rim c of the head is made as in Fig. 7, being formed hollow and fitted with a screw-thread in the rim c .

A bolt, P², passing through the stud, with a nut on its outer end, holds the plate I to the stud, and adjustment of the plate in relation to the rim and file is effected by screwing the stud in or out of the rim. A check-nut, P³, is provided for holding the stud when adjusted.

The feed-plate I, being flexible and having its ends attached, respectively, to the flanges or rims c and c' , which carry the files F and F', it follows, when adjustment of the rims is made for increasing or decreasing the space between the files, that the adjustment of the feed-plate to correspond therewith is effected; also, that the flexure of the guiding-plate accommodates all adjustments of the files.

The feeding is effected by the crowding along of the saw-teeth by the inclined surface of the plate I as the shaft and files revolve, the recess in the periphery allowing the lateral action at the position of feed. The front end of the plate I takes into a tooth as the file F leaves it, and slides the saw and carriage to

the left, carrying it along to a position where the part of the file following the recess will just engage with a new tooth.

The files F and F' are preferably set at a distance apart of three teeth, and the feed-plate is set to feed the distance of two teeth at each revolution, so that each file will work on a separate tooth-space and the two files cut alternate teeth or spaces.

In the operation the saw is clamped onto the carriage with its teeth in position to be engaged by the file and feed-plate, as shown by dotted lines. The nut *n* is then adjusted to give proper gage, and the work is quickly performed by turning the crank B', the action of filing and feeding being automatic.

In the present instance I have shown a flexible adjustable feed-plate, I, in connection with each head C or pair of files F F'. It will be obvious, however, that a single one of said feed-plates I located on either of the heads C, or as convenient, and operating in the manner substantially as set forth, would accomplish the feeding operation.

In some instances, if desired, the head C may be made to slide on the shaft in lieu of feeding by the longitudinal movement of the carriage. This can be done by simply making the head loose on the shaft and confining it from revolving independent of the shaft by a longitudinal spline and groove.

What I claim as my invention, and desire to secure by Letters Patent, is—

1. A rotatable file-supporting head having a fixed rim or file-attaching plate, combined with an adjustable rim or file-attaching plate that is movable in a direction parallel with the axis of the head, and a pair of circular files respectively supported in connection with said plates, substantially as and for the purpose set forth.

2. The revoluble file-supporting head, provided with flanges or holding-rims for supporting files, adjustable one from the other in a direction longitudinal with the axis of rotation, combined with an adjustable inclined feed-plate, substantially as described, whereby the distance between the files can be regulated and the feed simultaneously adjusted, as set forth.

3. The file-supporting head having the fixed flange *c*, the movable flange *c'*, mounted thereon, the adjusting-sleeve D, confined between the shoulder *d* and nut E, and the check-nut E, substantially as set forth, in combination with the circular files F F' and feed-plate I, substantially as set forth.

4. In a saw-filing machine, the combination of a revoluble operating-shaft, a plurality of circular files mounted on said shaft and capable of adjustment toward or from each other, an adjustable diagonal feeding-guide rotating with said files, and a support for a saw, substantially as set forth.

5. A pair of circular peripherally-recessed files and a flexible feed-plate, one end of which

is secured in conjunction with one of said files and the opposite end secured in conjunction with the other of said files, the peripheral edge of said feed-plate being formed on a circle the diameter of which corresponds with the diameter of said files, combined with a revoluble file-supporting shaft and a work-supporting carriage, substantially as and for the purposes set forth.

6. In a saw-filing machine, the peripherally-recessed files F and F', disposed at a distance apart corresponding to three of the saw-teeth, and the diagonal peripheral feed-plate disposed for advancing the work the space of two saw-teeth at each revolution, combined with the rotating shaft and file-supporting head and the yielding saw-supporting carriage, substantially as set forth.

7. The combination of a revoluble shaft, a plurality of circular peripherally-recessed files mounted thereon, a rocking supporting-frame, and an inclined feed-plate rotating with said shaft and files and adapted for engagement with the teeth of a saw supported on said frame, substantially as and for the purpose set forth.

8. The combination of a circular file mounted upon a revolving operating-shaft, a backwardly-yielding saw-supporting table, and an adjustable feed device acting upon the saw-teeth for feeding forward the work, substantially as and for the purposes set forth.

9. The combination of an annular revoluble file and a rocking support adapted for supporting a saw in position to be acted upon by said file, substantially as set forth.

10. The combination of the annular revoluble files having a peripheral recess, a rocking supporting-carriage adapted for sustaining a saw in position to be operated upon by said files, and a diagonally-disposed feed-plate revolving in conjunction with said files and peripherally engaging the teeth of the saw for feeding along the work, substantially as set forth.

11. The combination of a revoluble file, a saw-supporting carriage longitudinally movable on a rocking-frame, and provided with clamp devices for sustaining a saw in position to be acted upon by said file, and a flexible adjustable guide or feed plate the peripheral edge of which is adapted to engage the saw-teeth for feeding along the work, substantially as set forth.

12. The combination of a revoluble head carrying a plurality of circular peripherally-recessed files, a longitudinally-movable carriage mounted on a rocking support and adapted for supporting a saw in position to be acted upon by said files, and a flexible adjustable feed-plate for feeding along the work, substantially as set forth.

13. The combination of the revolving files, a saw-supporting carriage provided with pivot-supports upon the frame substantially parallel with the axis of the files, and having a rock-

ing action toward and from the files, and an adjustable stop for limiting the forward movement of said carriage, substantially as set forth.

5 14. The combination of the revolving files, a saw-support pivotally connected to the frame, and having rocking movement toward and from said files, an adjustable stop for limiting the forward movement, and a cushioning-
10 spring forcing forward said saw-support with a yielding pressure, substantially as hereinbefore set forth.

15 15. The combination, with revolving filing devices, of the saw bed or carriage having its supporting-frame pivoted to give rocking action, the arm or handle-lever fixed thereto, and the gage bolt provided with a cushioning-spring, and upper and lower nuts confining
20 said spring and arm in relation to said bolt, substantially as and for the purpose set forth.

16. The combination of a revolving filing

mechanism and a saw-supporting carriage provided with an extensible bed-surface and adjustable clamps for retaining a saw-blade thereon, substantially as set forth. 25

17. In a saw-filing machine, the saw-supporting bed having a longitudinal groove, as J', in its surface, in combination with a longitudinally-adjustable bar, as J, forming an extension thereof, substantially as and for the
30 purpose set forth.

18. The adjustable stud, as P, having the attaching-screw P², in combination with the flexible peripheral feed-plate, circular file F, and rotating file-supporting head, substan-
35 tially as and for the purpose set forth.

Witness my hand this 7th day of August, A. D. 1886.

DAVID HARRINGTON.

Witnesses:

CHAS. H. BURLEIGH.

ELLA P. BLENUS.