

(No Model.)

5 Sheets—Sheet 1.

H. L. MORRELL.
SAW SETTING AND FILING MACHINE.

No. 598,267.

Patented Feb. 1, 1898.

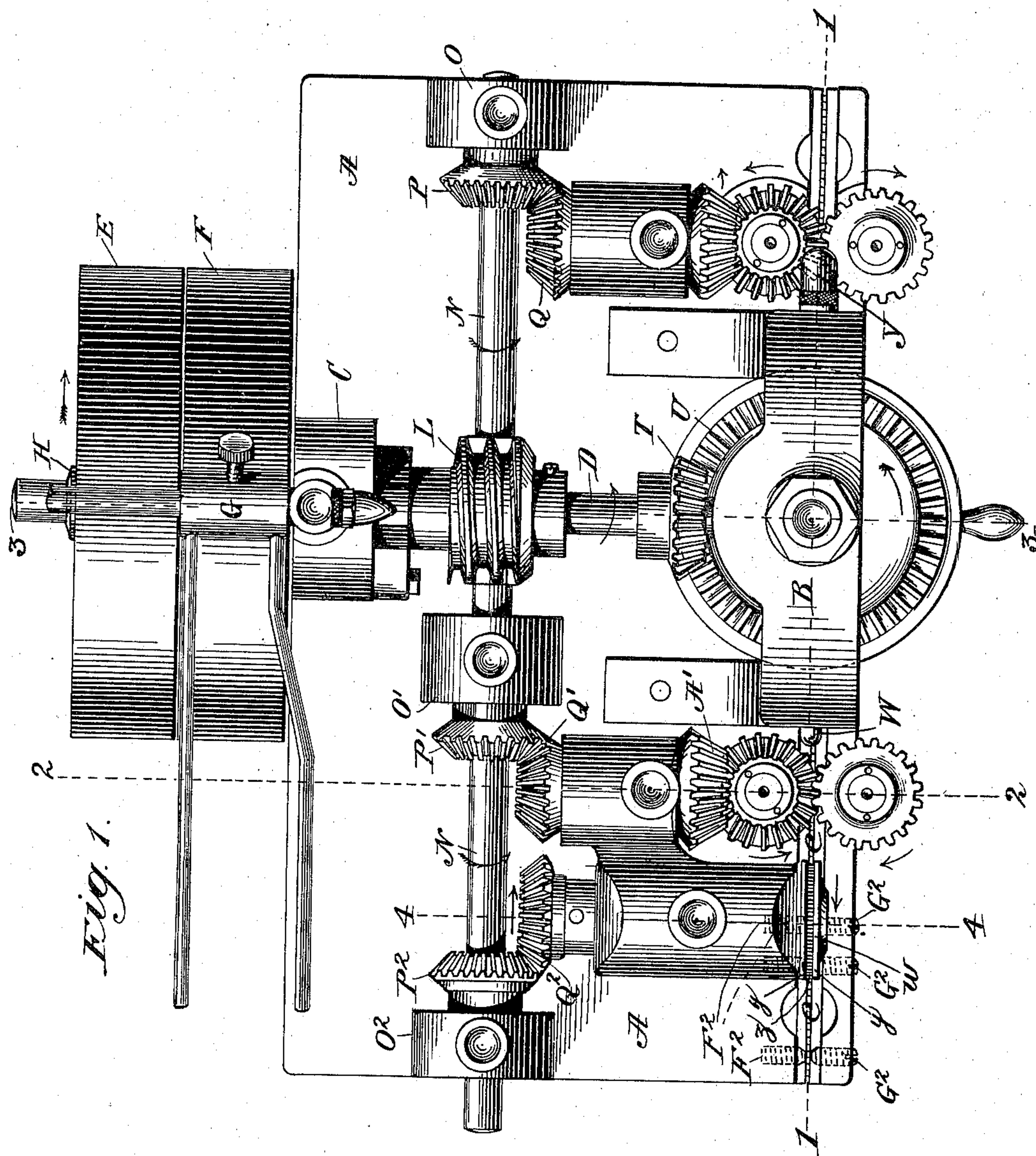


Fig. 1.

Witnesses
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Henry L. Morrell
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(No Model.)

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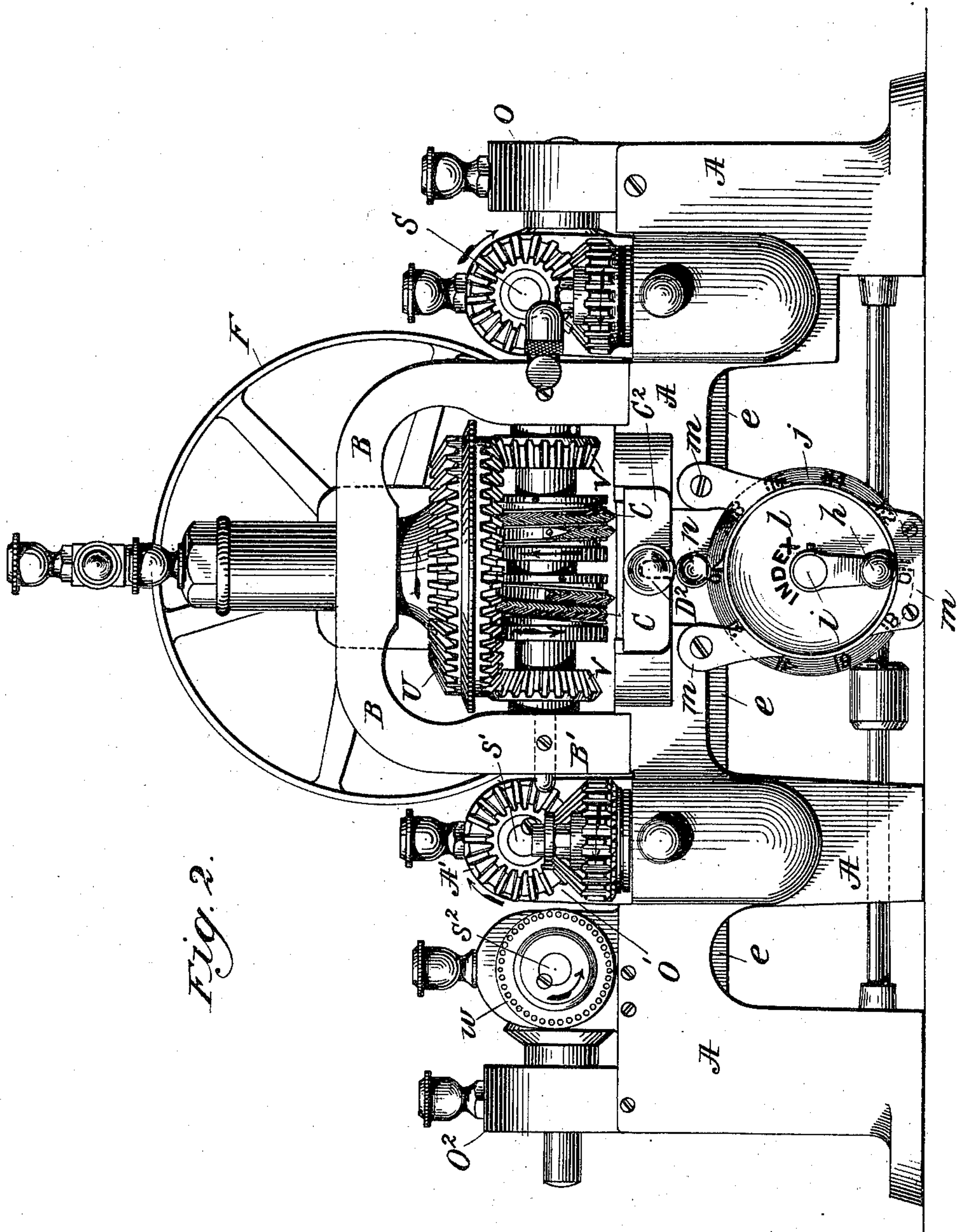


Fig. 2.

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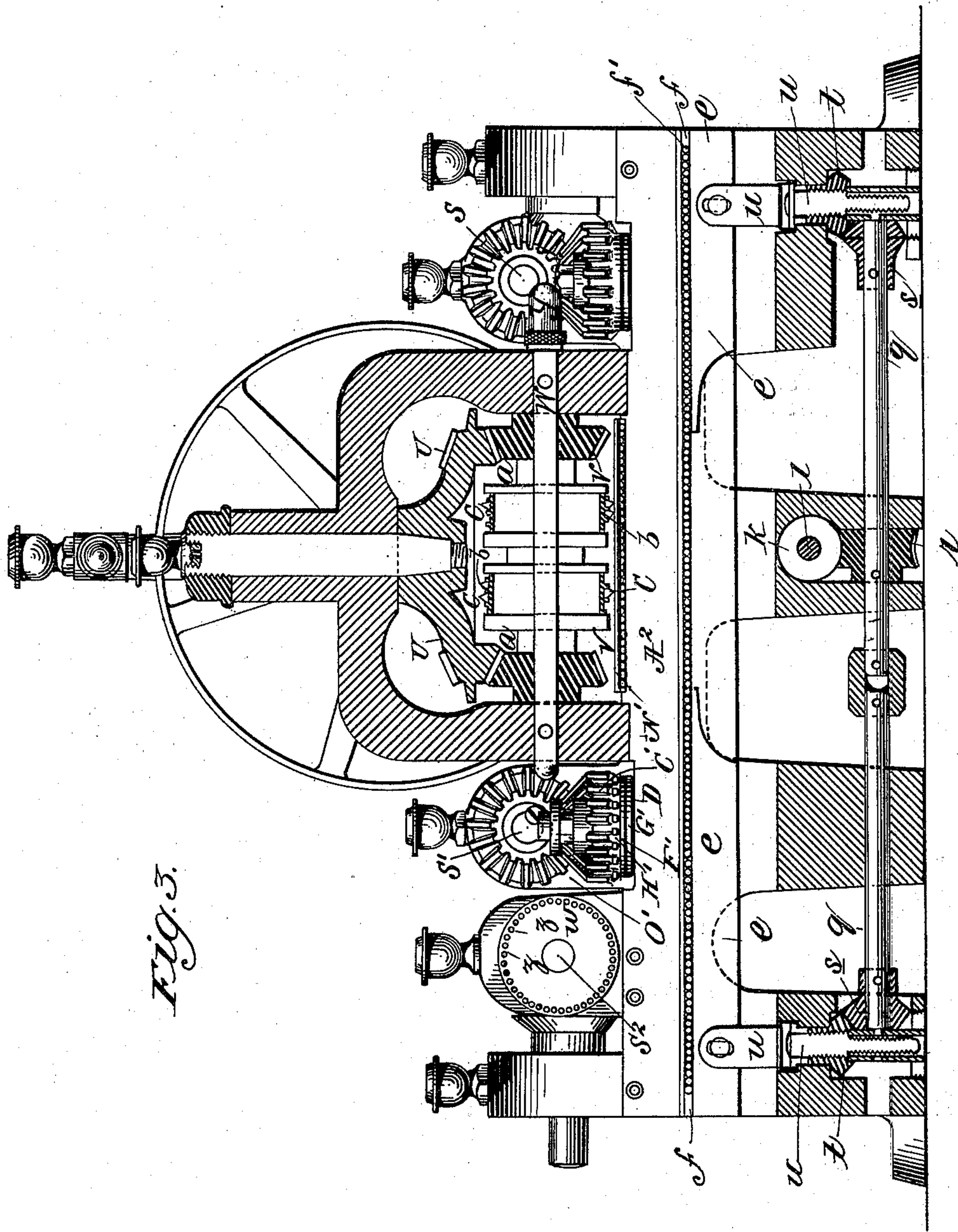


Fig. 3.

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Fig. 6.

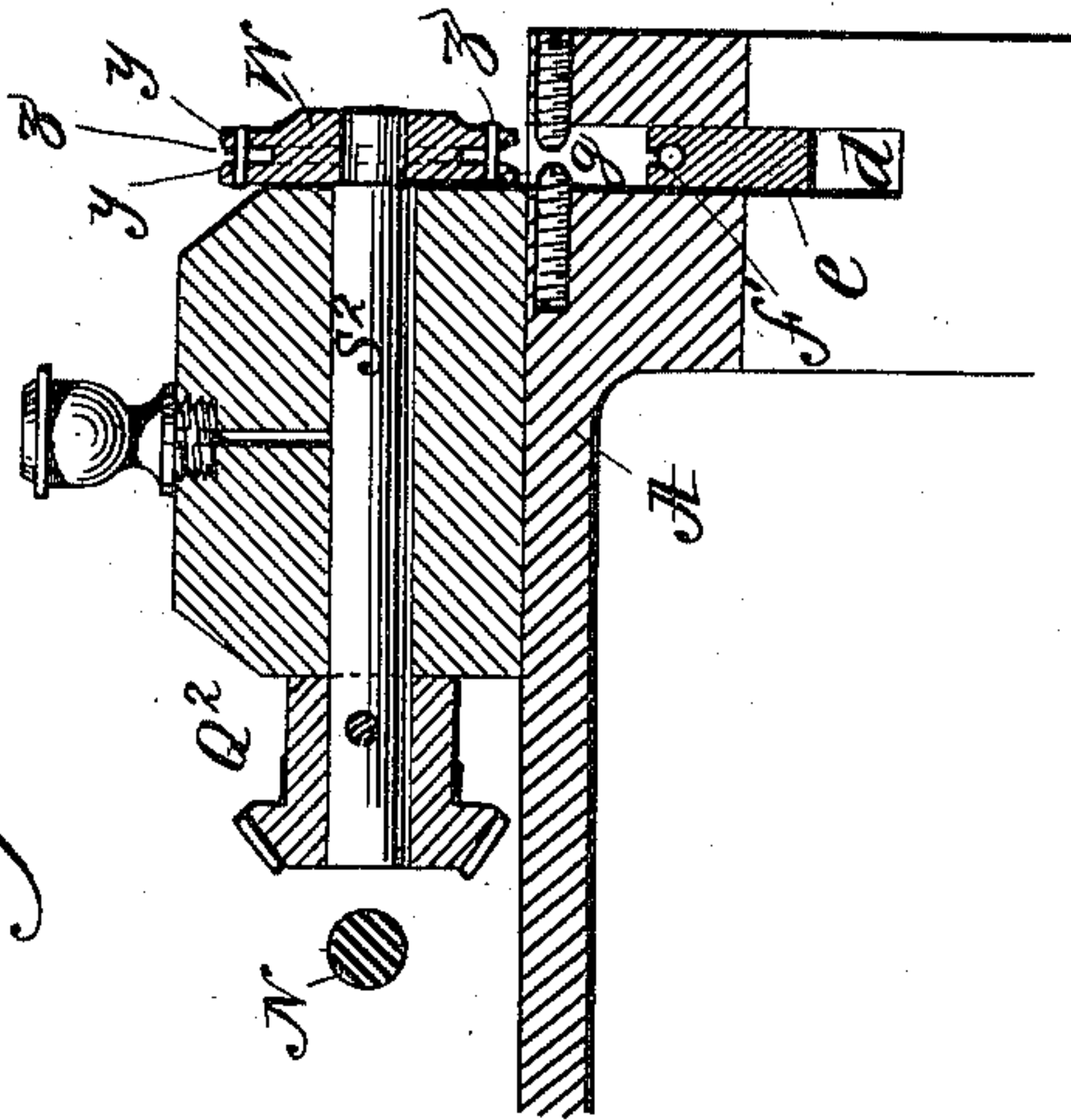


Fig. 8.

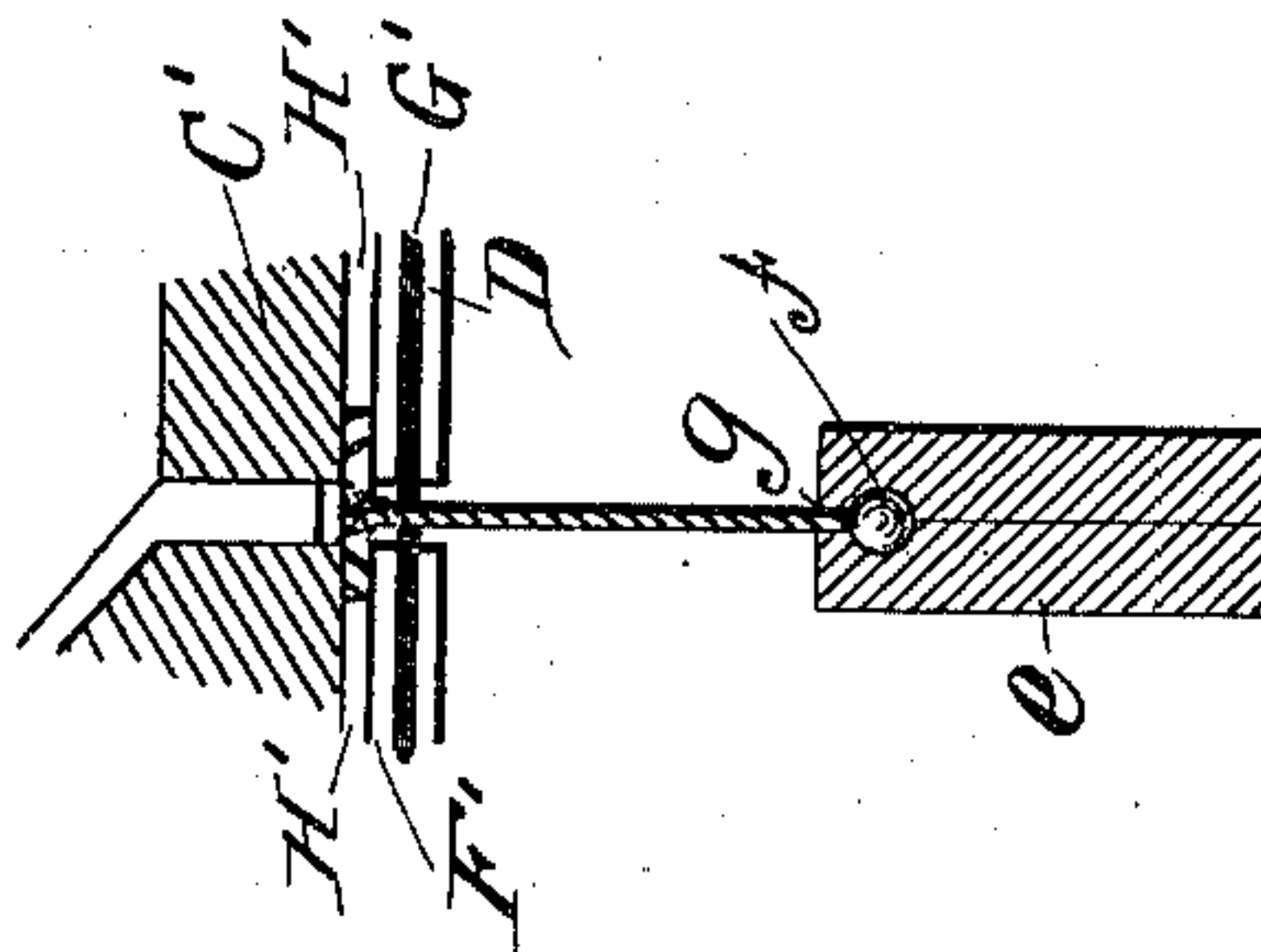
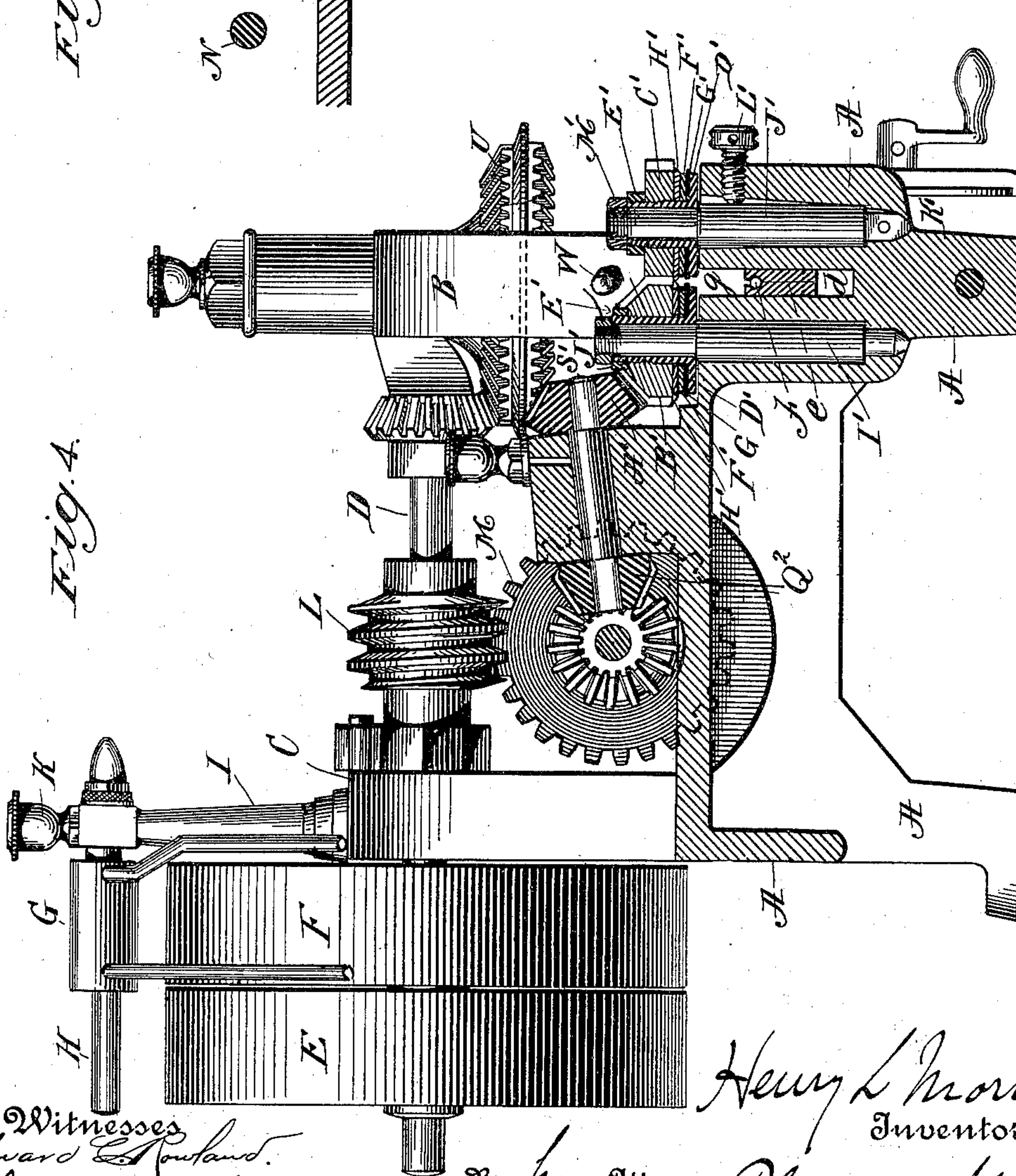


Fig. 4.



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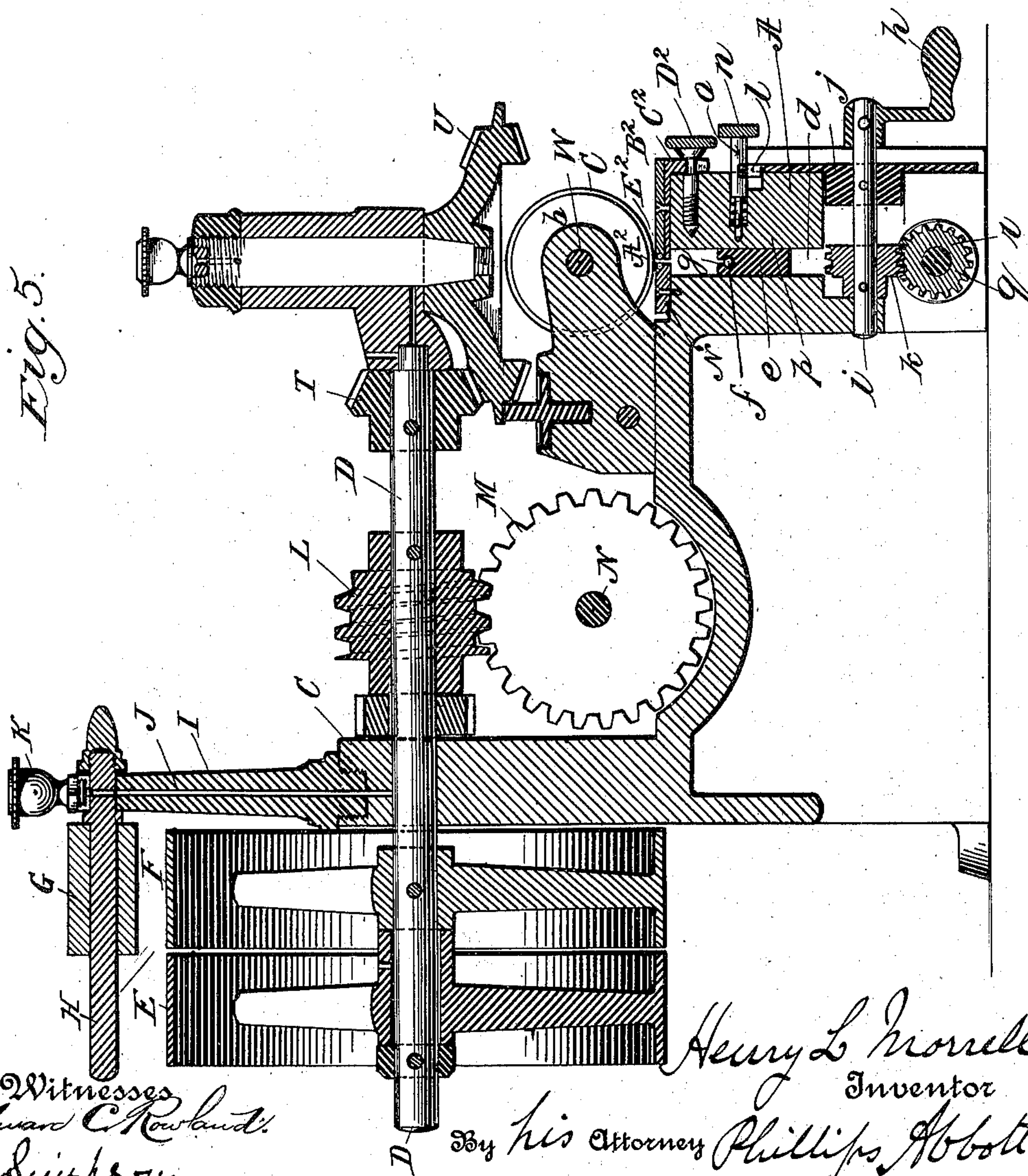
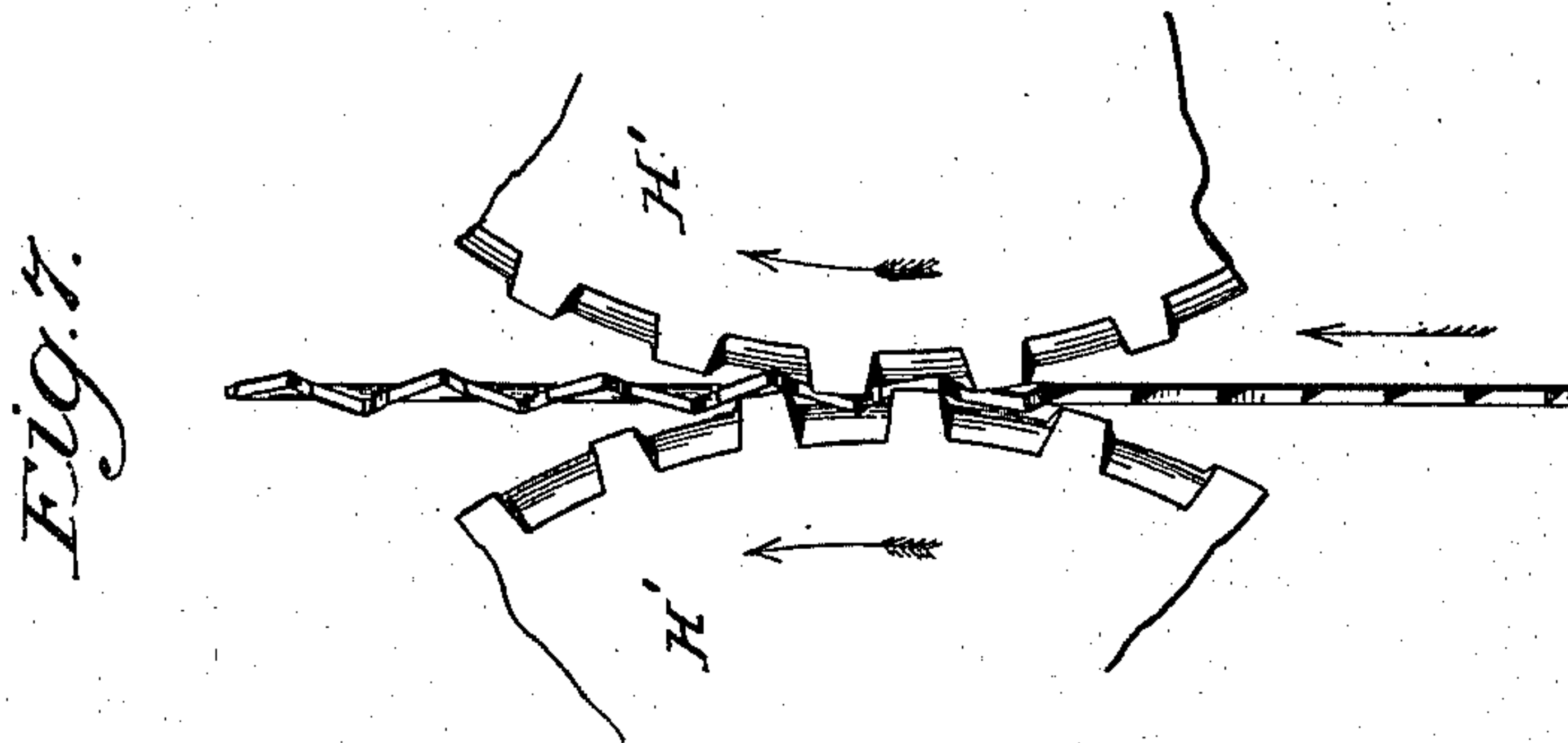
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UNITED STATES PATENT OFFICE.

HENRY L. MORRELL, OF BROOKLYN, NEW YORK.

SAW SETTING AND FILING MACHINE.

SPECIFICATION forming part of Letters Patent No. 598,267, dated February 1, 1898.

Application filed April 3, 1897. Serial No. 630,559. (No model.)

To all whom it may concern:

Be it known that I, HENRY L. MORRELL, a citizen of the United States, and a resident of Brooklyn, in the county of Kings and State of New York, have invented certain new and useful Improvements in Saw Setting and Filing Machines, of which the following is a specification.

My invention relates to a combined saw setting and filing machine, it being especially intended as a machine for filing butchers' saws, although adapted to file saws of any and all constructions. The machine in some respects resembles that heretofore invented by me and patented in United States Letters Patent dated November 3, 1896, and numbered 570,732; but in this machine I have advanced far beyond that set forth in the said patent, because in this I can take a saw-blade irrespective of its condition—i. e., whether or not the teeth are regular or its edge straight, or its set accurate, or the size of the teeth uniform—and by passing it once, or at most twice, through the machine it is made true and uniform with a straight edge, the teeth being all of the desired size, shape, and set and the saw otherwise put in good operative condition, and this work is performed in a small fraction of the time that would be required to do it by hand.

Referring to the drawings hereof, Figure 1 illustrates a plan view of the machine. Fig. 2 illustrates a front elevation. Fig. 3 illustrates a vertical sectional view on the line 1 1 of Fig. 1. Fig. 4 illustrates a vertical section on the line 2 2 of Fig. 1. Fig. 5 illustrates a vertical section on the line 3 3 of Fig. 1. Fig. 6 illustrates a vertical section on the line 4 4 of Fig. 1, showing the details of the feeding mechanism. Fig. 7 illustrates a detail of the tooth-setting devices. Fig. 8 illustrates a detail in section of the saw-setting devices and coacting parts.

A is the frame of the machine. It is ordinarily in the form of a single casting. This, however, is immaterial.

B is an upwardly-extending yoke.

C is an upwardly-extending post or bearing in which is journaled the main driving-shaft D, which is driven by the usual fast and loose pulleys E F.

G is a belt-shifter located upon a spindle

H, which is supported upon a standard I, through which there is a hole bored, with an oil-cup K at the upper end whereby the bearing of the shaft D is lubricated.

L is a worm fast on the shaft D, which meshes into a gear M, mounted on a shaft N, journaled in bearings O O' O², upon which are mounted beveled pinions P P' P², which engage, respectively, with other beveled pinions Q Q' Q², the latter being supported upon shafts S S' S², respectively. Upon the forward end of the shaft D is a beveled pinion T, which meshes into a duplex mitered gear U, engaging with its upper series of cogs, the lower series of which meshes into the beveled gears V V, which are supported by and turn upon a stationary shaft W, which has upon its end a handle or knob Y, whereby it may be pulled out of the machine, sliding through the pinions V. These pinions are mounted upon hubs *a a*, to which are connected file-bearing sleeves *b b*, the files being shown at *c*, so that as the pinions V V revolve these files revolve likewise, and they necessarily revolve in opposite directions, because one of the files engages with the right-hand and the other with the left-hand arc of the duplex pinion U.

At the front part of the machine (see particularly Figs. 3 and 5) there is provided a longitudinally-extending annular space *d*, within which is contained what I term the "saw-supporting bar" *e*, which has at or near its upper edge a small longitudinally-extending chamber or recess *f*, about as large as a large-sized knitting-needle, in which are contained a succession of small steel balls *f'*, which serve as antifriction devices for the saw-blade, there being a narrow slit *g*, wide enough to receive the edge of the saw, cut in the upper side or edge of this bar *e* and connected with the chamber *f*, within which the antifriction-balls are placed. This saw-supporting bar is adjustable vertically by the following instrumentalities, reference being had particularly to Figs. 2, 3, and 5:

h is a small crank attached to the shaft *i*, which is suitably journaled in the frame of the machine, and upon the shaft is keyed an index-dial *j* and worm-wheel *k*. Outside of the index-plate there is a stationary cover-plate *l l*, which is supported upon the frame by suitable laterally-extending portions *m*,

and in the rear edge of the index-plate *j* there are notches cut, in which engages the thumb *n* on a spindle *o*, which is normally thrust outward by a coiled spring *p*, so that the plate
5 may be locked in any desired position.

q is a longitudinally-extending shaft upon which is keyed a worm-pinion *r*, into which the worm *k* meshes, and upon either end of the shaft are two beveled pinions *s*, which
10 mesh into corresponding beveled sleeves *t*, which are journaled in the main frame, as shown, and are internally threaded, with the threads of which externally-threaded spindles *u u* engage, which spindles at their ends are
15 pivoted, as shown, to the bar *e*.

The operation of this part of the device is obvious. Upon turning the crank *h* the worm *k* is revolved, which transmits motion to the shaft *q*, and through the beveled pinions *s* and
20 the beveled sleeves *t* and the spindles *u* the saw-supporting bar *e* is lifted or depressed as desired.

The saw feeding and setting devices are as follows: At the incoming end of the machine,
25 as already partly explained and as illustrated in Figs. 2, 3, and 6, there is located a shaft *S*², upon the rear end of which is the beveled pinion *Q*², and upon the front end of it is what I term the "feeding-disk" *w*. This disk
30 (shown best in Fig. 6) has a deep groove cut in its edge somewhat wider than the widest saw-blade which will be manipulated upon the machine, so that there are left two lateral edges or plates *y y*, and bridging the space
35 between these two parts *y y* are a succession of pins *z*, (see Figs. 1 and 6,) which are so spaced and of such number as will coincide with the spacing and number of the teeth of the saw, and the vertical adjustment of the
40 saw is such that as this feeding device revolves the cross-pins in it gradually fit into the spaces between the teeth of the saw and by their impingement against the sides of the teeth feed it from left to right. Imme-
45 diately beyond—that is, to the right from this feeding device—are located the setting devices. Special reference is had to Figs. 1, 2, 3, and 7. In them it will be seen that the beveled pinion *A'*, which is mounted upon
50 the shaft *S'*, meshes into a horizontally-depressed beveled pinion *B'*, which has cogs on its inclined and also on its vertical face. Those on its vertical face engage with a horizontally-acting pinion *C'*. Each of the pin-
55 ions *B'* and *C'* are mounted upon a flanged sleeve *D'* and are rigidly clamped thereto by clamp-nuts *E'*, and above each of the flanges *D'* there are washers *F'*, and between the flanges and the washers there are rubber or
60 similar compressible rings *G'*, so that when the nuts *E'* are screwed up tight those washers are put under considerable compression, whereby they are squeezed out laterally throughout the circumference of the parts,
65 thus giving a partial-yielding support for the blade of the saw, which passes through be-

tween them immediately adjacent to the teeth, as shown in Fig. 8.

Immediately above the washers *F'* are located the saw-setting disks *H'*. They, as
70 shown in Figs. 7 and 8, are flat disks, of steel, having upon their edges peculiarly-constructed setting-teeth, the teeth of one of the disks meshing into the recess between the teeth in the other, and vice versa, and these teeth are
75 cut on an angle relative to the vertical plane, so that all of those upon one of the disks—say that upon the right hand—will press the teeth of the saw with which they engage to the left, and those upon the other or left-hand disk
80 will press the teeth of the saw with which they engage to the right, and the space between the teeth on each of these disks is made considerably larger than the width of the
85 teeth themselves, so that sufficient play is permitted for the gradually-widening lower portion of the teeth of the saw. Consequently the teeth upon each of the disks act in the
operation of the machine as punches, which
90 press against the respective teeth of the saw, and the spaces between the teeth on the opposite disk act as anvils for each of the said punches, the teeth upon one of the disks en-
gaging with the saw-teeth which are to be set to the right, and those only, and the teeth upon
95 the other disk engaging with the saw-teeth which are to be set to the left, and those only.

It is obvious that there must be the proper coincidence and registration between the
feeding devices, already described, and these
100 setting devices, so that the saw will be fed with exactness and in such manner as that the teeth on it will properly register with the punches or teeth upon the setting-disks, and it is also necessary that the feeding and also the
105 setting devices shall be made to coincide with the special saw to be manipulated by the machine. This, however, is not practically of much consequence, because all butchers' saws are "toothed and set" in practically the same
110 manner, also most band-saws, and to a large extent bucksaws, and this invention is intended as a means for sharpening and renovating saws of the above classes, large numbers of which, in the cities and large centers,
115 daily require attention.

The pinion *B'* is fixed, the flanged sleeve *D'*, upon which it is mounted, being itself supported upon the upper end of a spindle *l'*, which is rigidly set in the main frame, as
120 shown, the several parts being held firmly upon it by a nut *J'*, which is threaded to the upper end of the spindle *l'*. The pinion *C'*, however, and the parts which coact with it are made adjustable toward and from the
125 parts just described, so that saws of different thickness may be operated upon it with equal advantage and also so that the teeth may be set more or less, as desired, irrespective of the shape of the setting teeth or punches. This
130 adjustment is attained in the following manner: The sleeve *D'*, which supports the pin-

ion C', is mounted upon a spindle J', which is preferably pivoted, as at K, to the frame of the machine, and the boring or hole in which it is located is made somewhat larger than the spindle, particularly at its upper part, as shown best in Fig. 4, and a set-screw L' is threaded into the main frame A, whereby these parts may be set over toward the opposite parts, with which they coact, or allowed to recede from them. The pinion C' and the sleeve upon which it is mounted are confined upon the upper end of the spindle J' by a nut M', which is threaded to the upper end of the spindle.

The saw-filing devices c c have all been sufficiently described, particularly when reference is had to my said prior patent. There are, however, certain novel features in the construction of the files illustrated in this particular case which I intentionally have not described, since they form the subject-matter of another application for Letters Patent filed concurrently herewith. It is needful to say, however, that these files, the same as the feeding and setting mechanism, must be made upon the same system as these last two instrumentalities—that is to say, they must coincide and accurately register with the teeth of the saw being sharpened. In other words, the feeding mechanism, the setting mechanism, and the filing mechanism must all be made upon the same plan or system as to size, spacing, and pitch.

It remains only to describe the clamping-plates which rigidly confine the saw at or near the base of the teeth opposite the files. These devices are best seen in Figs. 2, 3, and 5, special reference being had to Fig. 5, and they are as follows:

N' is a plate rigidly fastened to the base of the machine by screws, as shown, in that part which is adjacent to the files, and in the front edge of it a recess is cut in which antifriction-balls A² are placed. B² is another plate in the same plane as the plate N', which is attached by screws, as shown, to an angular-shaped piece C², which slides in ways upon the frame and with the flange of which an adjusting-screw D² engages. This adjusting-screw is threaded into the main frame A, as shown in Fig. 5, and in the rearwardly-presented edge of this plate B² a similar recess and series of balls E² is arranged which face the balls in the opposing plate N'.

At the right of the devices just described there are additional feeding devices, comprising beveled gears or pinions and plates, between which a rubber ring is clamped, but without any teeth-setting disks, which are or may be substantially the same as the parts already described and indicated generally by the reference-letters B', C', D', E, and G', with coacting parts. They are provided merely for the purpose of feeding the saw, after it has been set and sharpened, out of the machine.

The bearings throughout the machine are provided with lubricating devices, adjusting

devices, wear-reducing devices, and the like instrumentalities, which may be the same as those employed in mechanism of this class, some of which are illustrated in the drawings, but do not require special description, excepting to call attention to the saw-centering devices at the left hand of the machine, and which guide it and determine its proper presentation to the feeding and setting mechanism. The devices referred to are the screw-plugs F², which are screwed into the main frame of the machine and always maintain a fixed position. Their outer points are smoothed off and are preferably case-hardened, so that they will permanently maintain their position and location. Opposite each of these fixed screw-plugs is an adjustable screw-plug G² G² G², which are by means of a screw-driver or other such device adjusted toward and from their opponents (the fixed ones) to coincide with the thickness of the saw-blade being operated upon.

Having now described the apparatus, its operation, briefly stated and without entering into details, is as follows: Power is transmitted through the main driving-wheels E and F, thence to the main shaft D, and through the roller and gear-wheel M to the counter-shaft N, thence through the appropriate gearing to the feeding mechanism and the saw-setting mechanism and saw-filing mechanism, and to the farther-on delivery feeding mechanism shown at the right of the machine. The saw-blade is introduced at the left-hand end of the machine, so that its straight untoothed edge passes through the longitudinal slit g in the bar e, and so that it rolls upon the edge which rests upon the series of antifriction-balls f' with exceedingly-slight friction through the machine, being fed by the teeth of the feeding mechanism w first through the saw-setting disks, whereby the points of the teeth are spread laterally to the right and left to the desired extent, all liability of snapping the teeth being avoided by reason of the cushioning action of the flattened rubber disks, which project beyond the edges of the plates or washers which hold them, and thence through the rotary files, which, being spiral in form, as shown, readily pass into and out of the teeth as they are successively presented to them. One of the files revolves from left to right and the other in the reverse direction, so that one of them properly acts upon the teeth which have a set to the right and the other upon the teeth which have a set to the left, and the action of the files is not only to sharpen the teeth, but, as will be seen, since their position is permanent and unvariable, the saw must be leveled up and the teeth made uniform in size and shape, the defects and inequalities incident to hand-filing not being possible when this machine is used, and after the saw has, as stated, been set, sharpened, and trued up then the delivery devices at the right of the machine continue to feed it, whereby it is delivered, the

spiral files themselves aiding in the operation.

It will be obvious to those who are familiar with this art that modifications may be made in the details of construction of the parts without departing in material respects from the essentials of the invention. I therefore do not limit myself to the details either as illustrated or described.

10 I claim—

1. A combined saw setting and filing machine embodying rotary feeding mechanism which engages with the teeth of the saw, oppositely-located circular teeth-setting devices, 15 rotary spiral files, and mechanism to drive the said instrumentalities contemporaneously and at uniform speed, for the purposes set forth.

2. A combined saw setting and filing machine embodying feeding mechanism which engages with the teeth of the saw, oppositely-located teeth-setting devices, rotary spiral files, means to support and guide the saw vertically and horizontally, and mechanism to 25 drive the said instrumentalities contemporaneously and at uniform speed, for the purposes set forth.

3. In a saw-filing machine, feeding mechanism which engages with the teeth of the saw, and thereby feeds it, rotary files revolving in different directions, positively-driven rotary devices for setting the saw, adjustable means for supporting the saw edgewise, and other adjustable means for supporting it side- 35 wise against the stress of the files, for the purposes set forth.

4. A combined saw setting and filing machine embodying feeding mechanism which engages with the teeth of the saw, oppositely-located and positively-driven teeth-setting devices, rotary spiral files, adjustable devices for supporting the saw edgewise, and other adjustable devices for supporting the saw sidewise against the stress of the files, and 45 feeding devices which engage with the side of the saw for delivering it from the machine, for the purposes set forth.

5. In a saw-filing machine, a support for the saw comprising a bar having a chamber therein adapted to receive and hold antifriction-balls, and a slit connecting said chamber with the exterior of the bar through which the saw-blade enters edgewise, for the purposes set forth.

6. In a saw-filing machine, a support for the saw comprising a bar having a chamber therein, adapted to receive and hold antifriction-balls, a slit connecting said chamber with the exterior of the bar through which 60 the saw-blade enters edgewise, and means to adjust the said bar toward and from the saw-filing devices, for the purposes set forth.

7. In a saw-filing machine, clamping devices for the support of the saw sidewise against 65 the stress of the files, embodying metallic

parts provided with chambers adapted to receive and hold antifriction-balls, said balls projecting beyond the face of said metallic parts for the purposes set forth.

8. In a saw-filing machine, clamping devices 70 for the support of the saw edgewise against the stress of the files, embodying metallic parts provided with chambers adapted to receive and hold antifriction-balls said balls projecting beyond the face of said metallic 75 parts, and means to adjust one of said balls toward and from the other, for the purposes set forth.

9. In a machine for filing saws, supporting devices for the saw, embodying a vertically- 80 adjustable bar provided with antifriction-balls upon which the saw rests edgewise, and other bars or metallic parts likewise provided with antifriction-balls, which engage with the saw at its sides adjacent to the files of the 85 machine, for the purposes set forth.

10. In a saw-setting machine, devices to yieldingly hold the saw adjacent to the teeth-setting devices, comprising circular disks or rollers having cushioning material projecting 90 beyond their edges which material comes in contact with the saw adjacent to the setting devices, for the purposes set forth.

11. In a saw filing and setting machine, devices for setting the teeth, consisting in oppositely-located rotary disks, each provided 95 with radially-extending teeth the ends whereof are formed on an angle to the plane of the disk, between the teeth recessed spaces, the bottoms whereof are formed at an angle the 100 reverse of the angle at the end of the teeth, the teeth and recesses in the two disks being counterparts one of the other, devices to yieldingly hold the saw adjacent to the teeth-setting devices, comprising circular disks or 105 rollers having cushioning material projecting beyond their edges which material comes in contact with the saw adjacent to the setting devices, for the purposes set forth.

12. In a saw filing and setting machine, a 110 rotary feeding mechanism having pins or like devices which engage with the teeth of the saw, oppositely-located and positively-driven teeth-setting disks having alternate projecting and receding parts on their edges, and 115 which operate in conjunction with one another, rotary spiral files revolving in opposite directions, and a feeding mechanism beyond the files, which engages with the sides of the saw and delivers it from the machine, in combination with means to support the saw vertically and laterally, for the purposes set forth. 120

Signed at New York, in the county of New York and State of New York, this 26th day of March, A. D. 1897.

HENRY L. MORRELL.

Witnesses:

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A. B. MORRISON.