

No. 686,184.

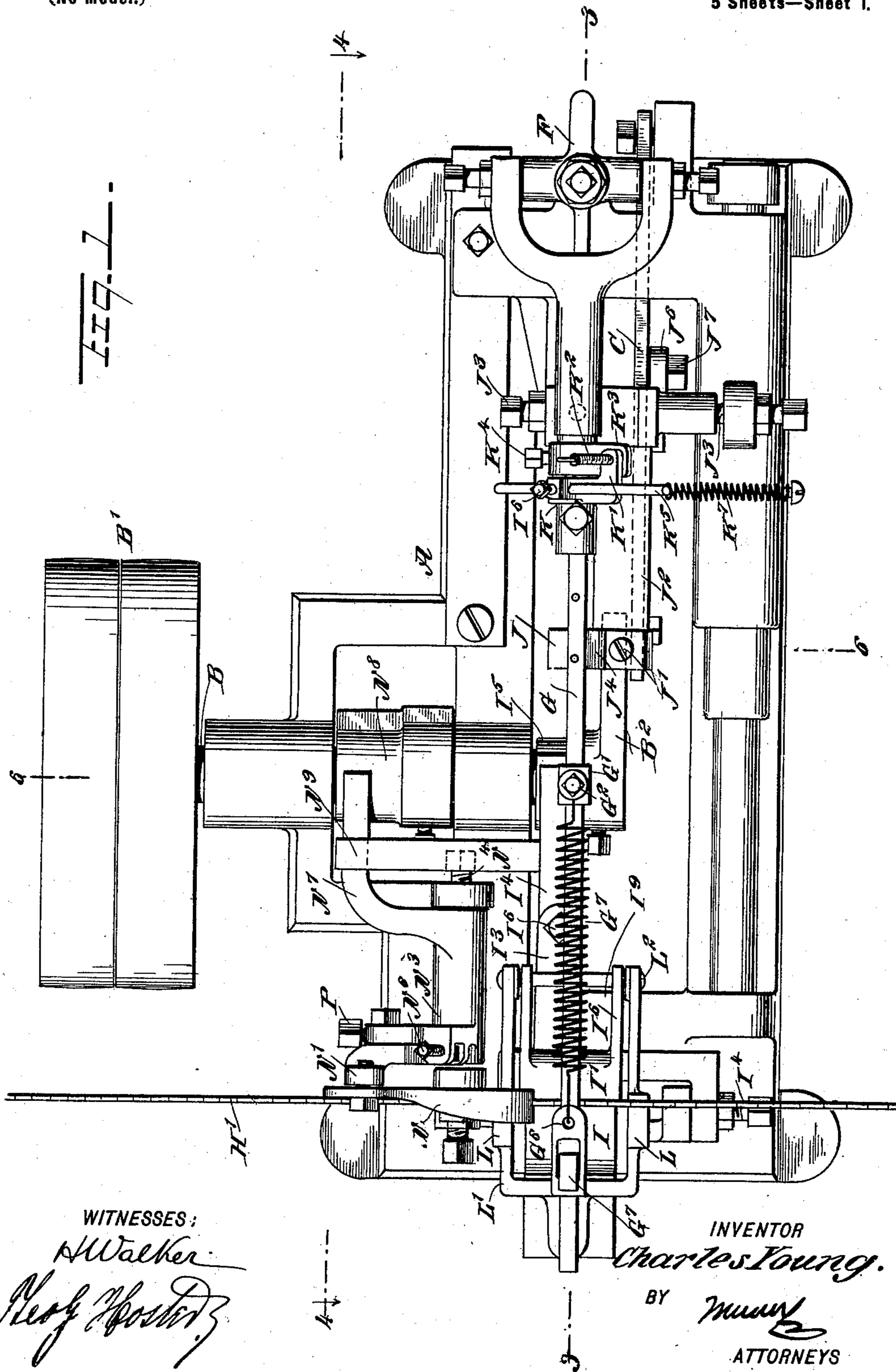
Patented Nov. 5, 1901.

C. YOUNG.
SAW FILING MACHINE.

(Application filed Jan. 3, 1901.)

(No Model.)

5 Sheets—Sheet 1.



WITNESSES:

H. Walker
George Foster

INVENTOR

Charles Young.

BY

Munn

ATTORNEYS

No. 686,184.

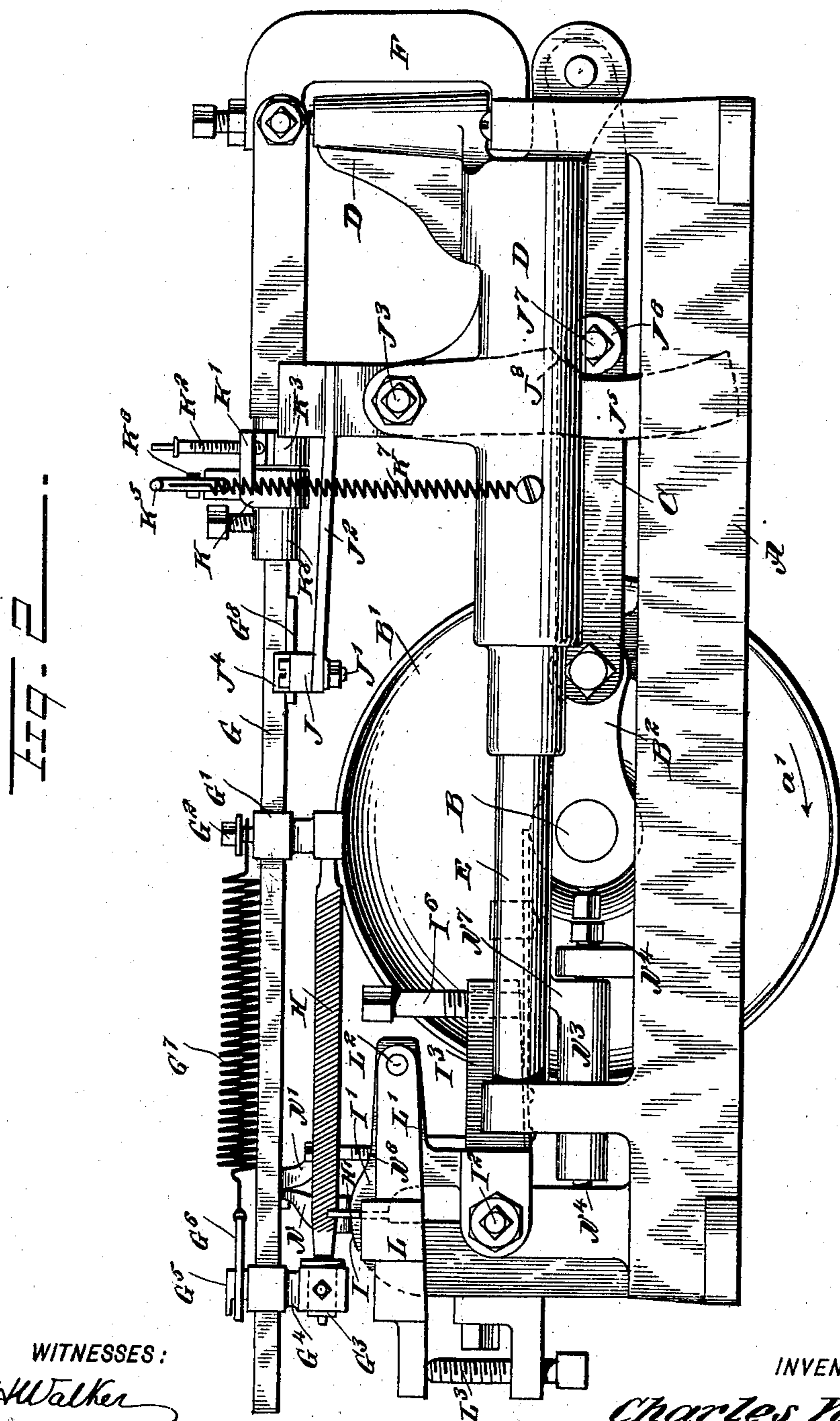
Patented Nov. 5, 1901.

C. YOUNG.
SAW FILING MACHINE.

(Application filed Jan. 3, 1901.)

(No Model.)

5 Sheets—Sheet 2.



WITNESSES:

H. Walker
Rev. G. H. H. H.

INVENTOR

Charles Young.

BY

Munn & Co.
ATTORNEYS

No. 686,184.

Patented Nov. 5, 1901.

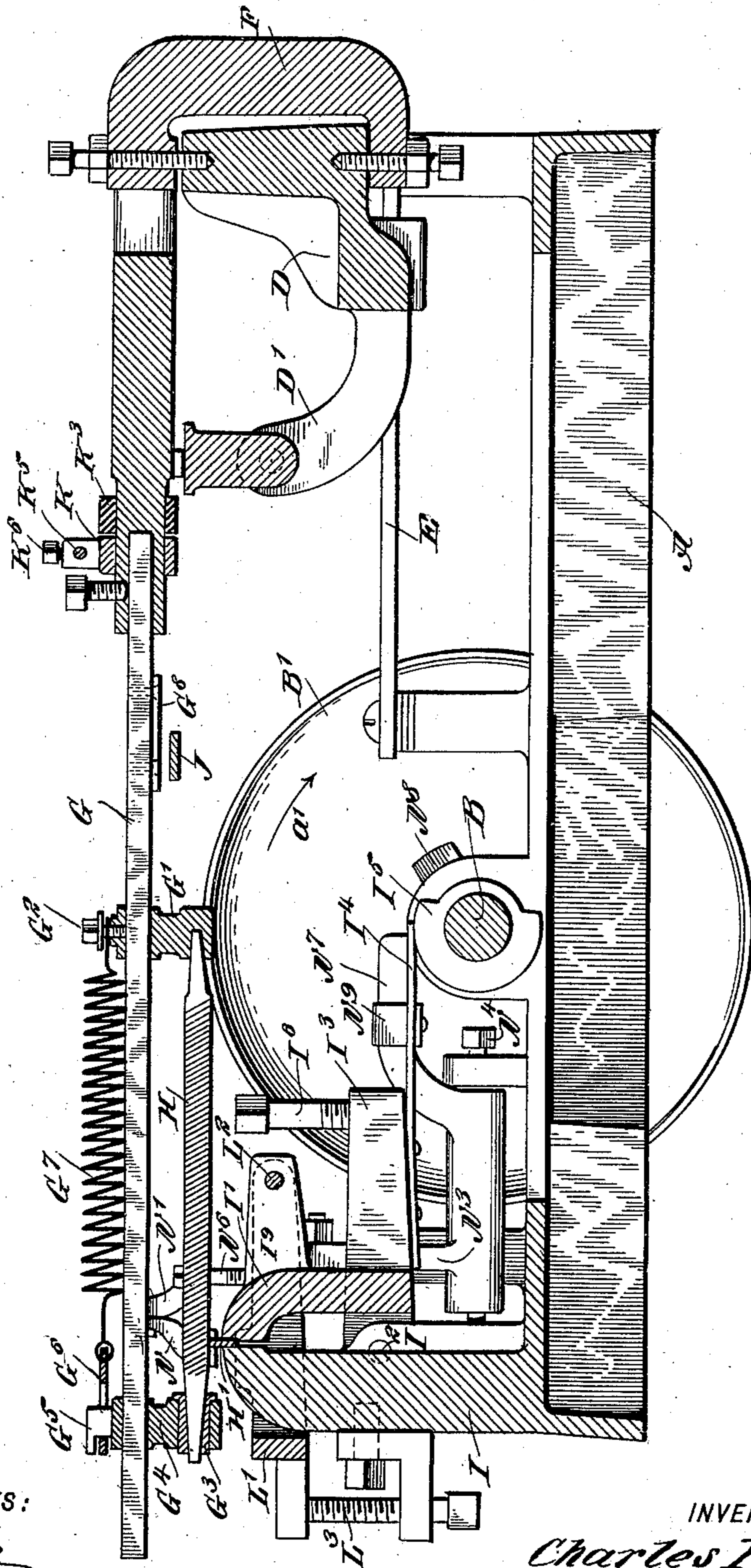
C. YOUNG.
SAW FILING MACHINE.

(Application filed Jan. 3, 1901.)

(No Model.)

5 Sheets—Sheet 3.

Fig. 2.



WITNESSES:

H. Walker
Rev. J. H. Foster

INVENTOR

Charles Young

BY

Mumford

ATTORNEYS

No. 686,184.

Patented Nov. 5, 1901.

C. YOUNG.
SAW FILING MACHINE.

(Application filed Jan. 3, 1901.)

(No Model.)

5 Sheets—Sheet 4.

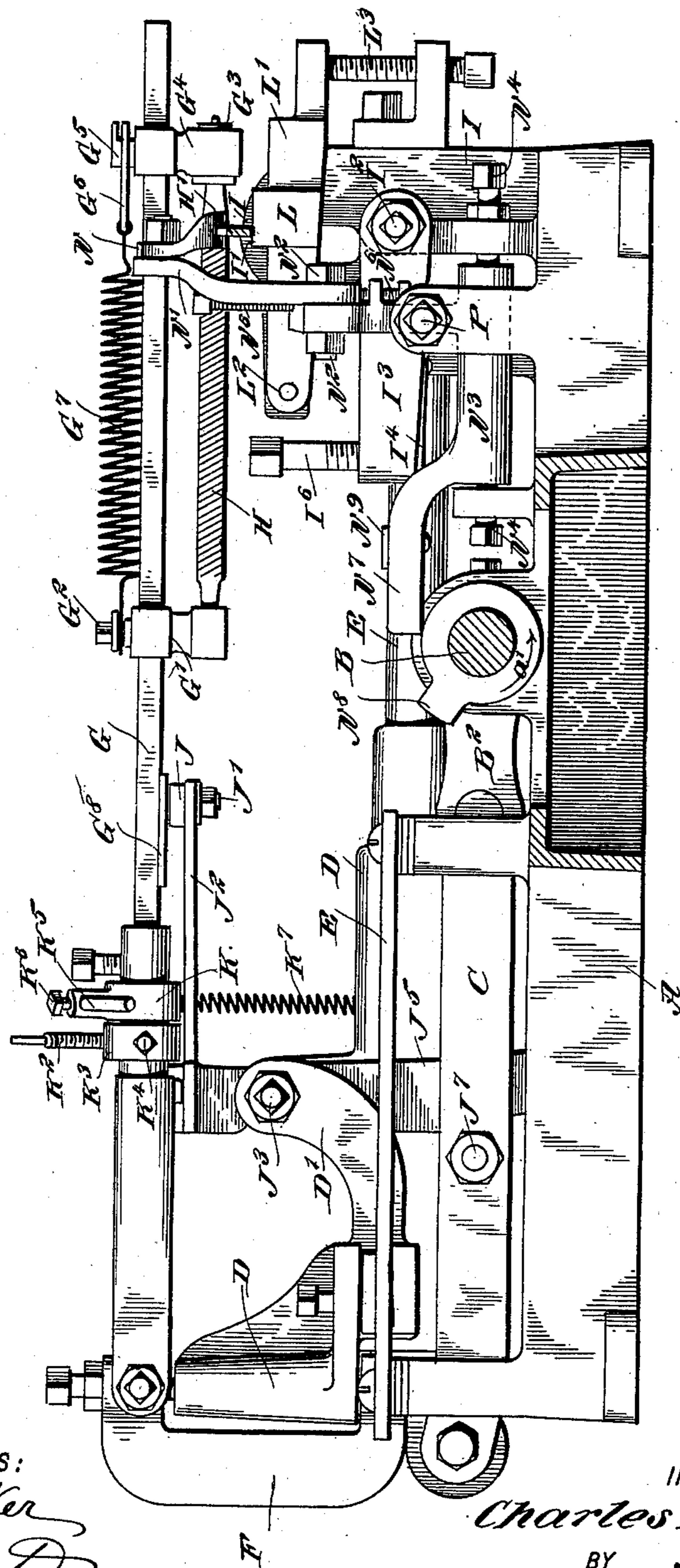


Fig. 4.

WITNESSES:

H. Walker
Rev. G. H. Foster

INVENTOR

Charles Young.

BY

Munn
ATTORNEYS

No. 686,184.

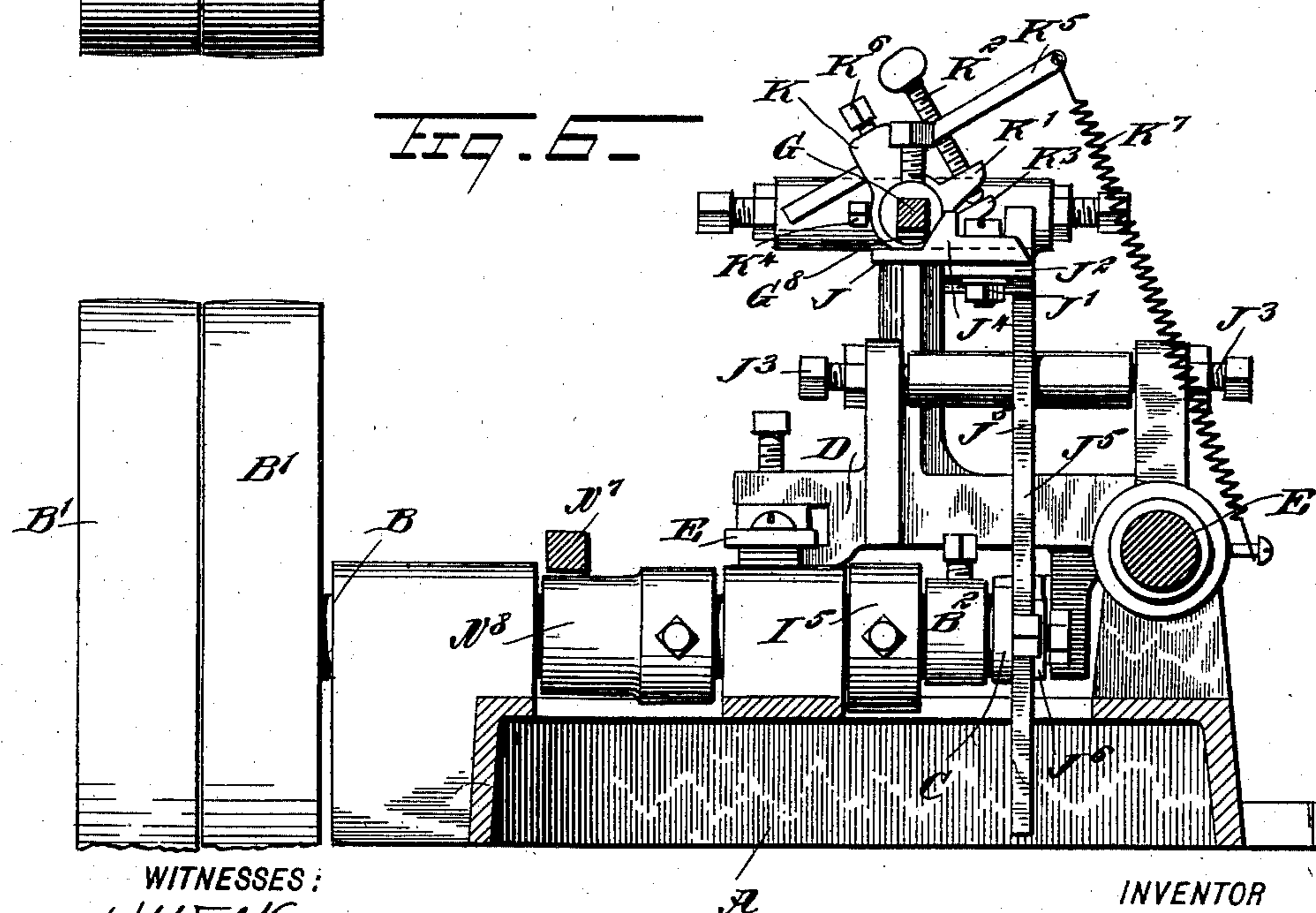
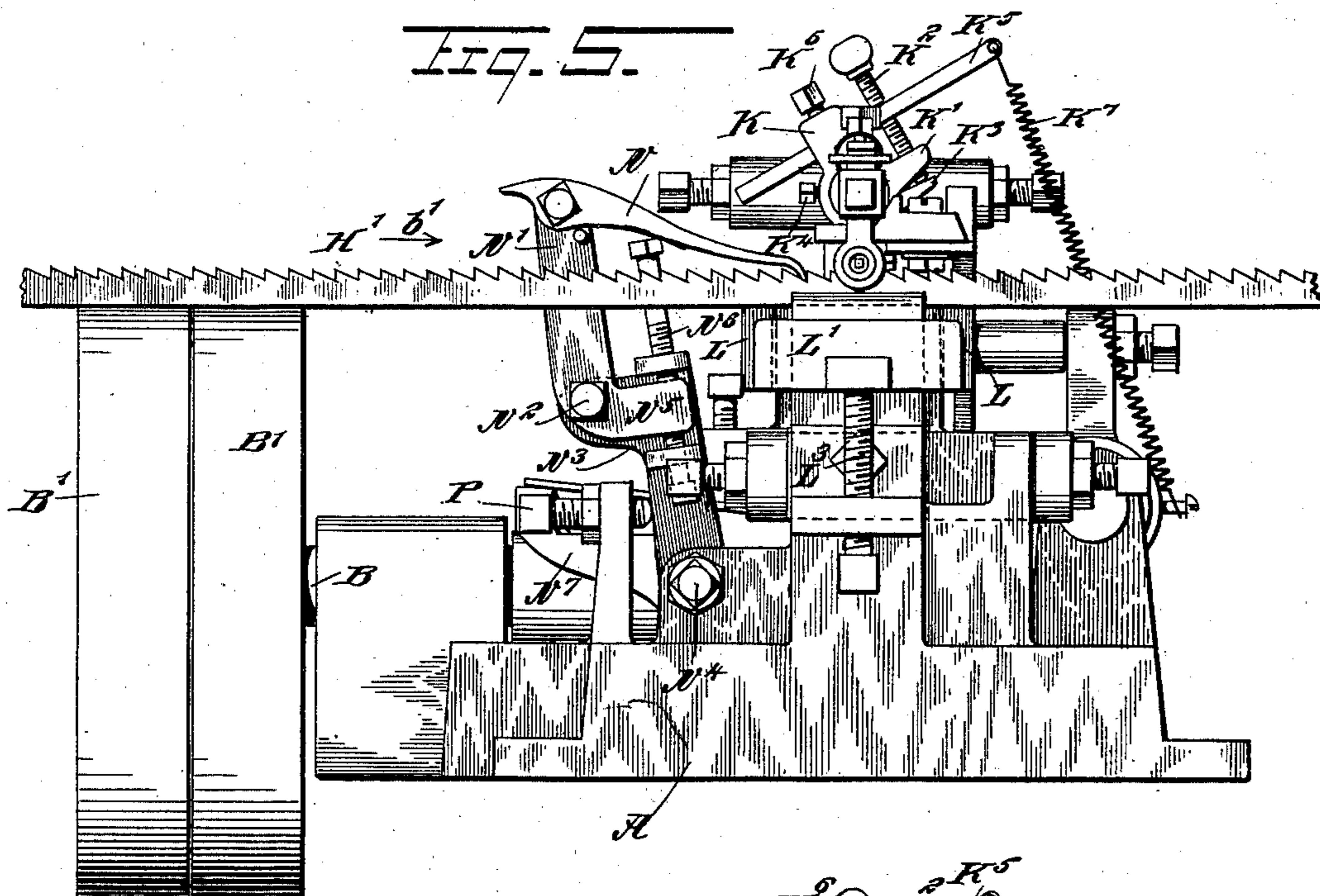
Patented Nov. 5, 1901.

C. YOUNG.
SAW FILING MACHINE.

(Application filed Jan. 3, 1901.)

(No Model.)

5 Sheets—Sheet 5.



WITNESSES:

H Walker
Rev. J. Foster

INVENTOR

Charles Young.

BY

Werner
ATTORNEYS

UNITED STATES PATENT OFFICE.

CHARLES YOUNG, OF YORK, MAINE.

SAW-FILING MACHINE.

SPECIFICATION forming part of Letters Patent No. 686,184, dated November 5, 1901.

Application filed January 3, 1901. Serial No. 42,003. (No model.)

To all whom it may concern:

Be it known that I, CHARLES YOUNG, a citizen of the United States, and a resident of York, in the county of York and State of Maine, have invented a new and Improved Filing-Machine, of which the following is a full, clear, and exact description.

The object of the invention is to provide a new and improved filing-machine more especially designed for filing band-saws and other saws and which is simple and durable in construction, very effective in operation, and arranged to automatically clamp the saw securely in place during the filing operation, the file moving back from the cutting-point of the tooth at the end of the filing stroke, to leave an accurately-filed tooth, and to permit of feeding the saw forward during the return stroke of the file, the latter receiving sufficient jar to dislodge the filings, and thus leave the file in proper shape for accurate working.

The invention consists of novel features and parts and combinations of the same, as will be fully described hereinafter and then pointed out in the claims.

A practical embodiment of the invention is represented in the accompanying drawings, forming a part of this specification, in which similar characters of reference indicate corresponding parts in all the views.

Figure 1 is a plan view of the improvement. Fig. 2 is a side elevation of the same. Fig. 3 is a sectional side elevation of the same on the line 3 3 in Fig. 1. Fig. 4 is a rear sectional side elevation of the same on the line 4 4 in Fig. 1. Fig. 5 is an end elevation of the improvement. Fig. 6 is a cross-section of the same on the line 6 6 in Fig. 1.

On a suitably-constructed bed A is journaled a transversely-extending shaft B, carrying at the outer end fast and loose pulleys B', connected by a belt with other machinery for imparting a rotary motion to said shaft B. On the inner end of the shaft B is secured a crank-arm B², connected by a pitman C with a carriage or cross-head D, mounted to slide longitudinally on suitable guideways E, secured to or formed on the bed-plate. The rear end of the carriage D is connected by a universal joint F with a file-holder G, carrying a file H for sharpening the teeth on the saw H' extending between the fixed jaw I and

the movable jaw I', as illustrated in the drawings. The inner end of the file H is held in a socket G', adjustably secured by a set-screw 55 on the file-holder G, the forward end of which is preferably made in the shape of a square bar, as is plainly indicated in the drawings. The outer end of the file H engages a thimble G³, removably held in a socket G⁴, mounted 60 to slide on the outer end of the file-holder G, said socket G⁴ being provided on its top with a notched head G⁵, engaged by a link G⁶, connected to one end of a coil-spring G⁷, secured at its other end to the set-screw G² of the 65 socket G'. By the arrangement described the spring G⁷ draws the socket G⁴ toward the fixed socket G', so that the file H is securely held in position and is prevented from turning by forming the bore of the thimble G³ 70 angular, the same as the file.

On the under side of the file-holder G and somewhat in the rear of the socket G' is arranged a wear-plate G⁸, adapted to engage a transversely-extending rest J, secured by a 75 bolt J' to an arm J², hung on centers J³, supported on a bracket D', carried by the carriage D. The rest J is formed at one side with a bevel or incline J⁴ for one side edge of the wear-plate G⁸ to abut and rest against for 80 the purpose hereinafter more fully described. The arm J² is provided with a depending arm J⁵, engaged at the rear edge by a friction-roller J⁶, mounted to turn on a stud J⁷, secured to a pitman C. The edge of the arm 85 J⁵ engaged by the friction-roller J⁶ is provided with an offset J⁸, so that the friction-roller in traveling over this offset imparts a sudden swinging movement to the arm J² to drop the file-holder G and the file H sud- 90 denly at the beginning of the forward stroke of the carriage D and pitman C, on which the friction-roller J⁶ is journaled, and to quickly raise the file-holder and file at the end of the forward stroke. The sudden move- 95 ment or jerk thus given to the file dislodges the filings adhering to the file, and consequently the file is always in a clean condition to properly file the tooth.

On the file-holder G is mounted to turn 100 loosely a cam K, formed with a longitudinally-extending arm K', in which screws an adjusting-screw K², abutting with its lower end on a collar K³, secured by a set-screw K⁴

to the file-holder. In the said cam K is held to a slide a transversely-extending rod K⁵, adapted to be secured in place in the cam by a set-screw K⁶, and on the other end of this rod K⁵ is secured one end of a spring K⁷, secured at its other end to the carriage D. The spring K⁷ exerts a downward and sidewise pressure on the file-holder G, so as to hold the file H in yielding contact with the tooth to be filed during the forward stroke of the carriage, the spring K⁷ also drawing the file-holder G sidewise, so as to bring the wear-plate G⁸ in contact with the incline or bevel J⁴ of the rest J. (See Fig. 6.) When the shaft B is rotated in the direction of the arrow α' , then the crank-arm B² and pitman C impart a reciprocating motion to the carriage D, file-holder G, and file H, so that the latter during the forward stroke files the saw-tooth, and during the back or return stroke the file H is out of contact with the tooth and moves above the same. When the carriage D is at the beginning of its forward stroke, then the arm J² is in a lowermost position, owing to the action of the friction-roller J⁶ on the depending arm J⁵, so that the wear-plate G⁸ abuts with one edge against the incline J⁴, owing to the action of the spring K⁷. By this arrangement the file-holder G is supported at one end on the universal joint F and is free to swing downward to engage the file H with the saw-tooth, the file being pressed in contact with the saw-tooth by the weight of the file-holder and the pressure of the spring K⁷. When the carriage D nears the end of its stroke, the friction-roller J⁶ presses the depending arm J⁵, so as to impart an upward swinging motion to the arm J², whereby the file-holder G, with its wear-plate G⁸, is caused to slide down the incline J⁴, so that the file H is first moved sidewise, and on a further upward swinging movement of the arm J² the rest J engages the wear-plate and swings the same upward, thus causing the file-holder G and its file H to swing into an uppermost position. During the return stroke the file-holder and its file are held in this position, and when the carriage G nears a rearmost position then the friction-roller J⁶ moves back to the lower segmental portion of the depending arm J, and consequently the arm J² swings downward, and in doing so the rest J leaves the wear-plate G⁸ and the spring K⁷ draws the side edge of the wear-plate up on the incline J⁴ until the file-holder G has again assumed its lowermost position and the file H has moved back into engagement with a tooth on the saw H'. It is understood that when the machine is in operation and the carriage D moves forward then during the first half-stroke the pitman C swings downward and the friction-roller J⁶ travels downward on the lower segmental edge of the depending arm J⁵, and when the carriage travels forward during the last half-stroke the pitman swings upward and the friction-roller J⁶ travels up-

ward on the said lower segmental edge of the arm J⁵ to finally travel up the offset J⁸, and thereby impart a sudden forward swinging motion to the depending arm J⁵ and an upward swinging motion to the arm J² for the purpose mentioned. During the return stroke of the carriage the friction-roller J⁶ first travels up the upper segmental edge of the depending arm J⁵ and then down again without giving movement to the arm J² and the file-holder, thus holding the latter in the raised position, and when the carriage reaches the end of its return stroke and begins the next forward stroke then the friction-roller travels down the offset J⁸ to allow the arm J² to swing into a lowermost position, which is retained during the forward stroke of the carriage. When the arm J² swings upward, as described, the incline J⁴ forces the file-holder G and the file sidewise to move the file away from the back of the tooth filed, and when the arm J² swings downward at the beginning of the next stroke the spring K⁷ draws the file-holder back to again engage the wear-plate with the incline J⁴ for the file to engage the back of the next tooth and file the same. By the arrangement described the file is not liable to drag over the tooth just filed. During the forward stroke of the carriage D, the file-holder G, and file H the saw H' is normally clamped between the jaws I I'; but during the return stroke of the file H the jaw I' is opened and a feeding mechanism now engages a tooth on the saw H', so as to shift the same transversely for the file H to engage the next succeeding tooth during the next forward stroke of the carriage D. The movable jaw I' is hung on centers I², carried by the bed-plate A, and the said jaw is provided with an arm I³, carrying a spring I⁴, the free end of which rests on the peripheral surface of a cam I⁵, secured to the shaft B adjacent to the crank-arm B². A set-screw I⁶ in the arm I³ engages the spring I⁴, so as to adjust the tension thereof. When the free end of the spring I leaves the high portion of the cam I⁵ during the rotation of the shaft B, then the said spring I⁴ and arm I³ swing downward to swing the jaw I' into an open position, and thus release the saw H', so that the latter can now be shifted transversely by the feed mechanism. The back of the saw rests on supports L, arranged on opposite sides of the jaws I I' and secured to or forming part of a U-shaped yoke L', pivoted at L² on arms I⁰, projecting from the movable jaw I'. The rear end of the yoke L' is engaged by a set-screw L³, so as to move the yoke up or down and bring the supports L in proper position, according to the width of the saw under treatment, so that the saw-teeth project the desired distance above the jaws I I' for the file to properly file the saw-teeth.

The saw-feed operates in conjunction with the movable jaw I' and consists, essentially, of a feed-pawl N, fulcrumed on an arm N',

(see Fig. 5,) pivoted at N² on a rock-arm N³, hung on centers N⁴, carried by the bed-plate A. The arm N' has an extension N⁵, engaged at the top and bottom by set-screws N⁶, screwing in the rock-arm N³, so as to permit of adjusting the arm N', and consequently the pawl N, to compensate for wear of the said pawl. The rock-arm N³ is provided with an arm N⁷, engaging the peripheral surface of a cam N⁸, secured to the shaft B, and said arm N⁷ is pressed on by a spring N⁹, attached to the spring I⁴, previously mentioned, so that the arm N⁷ is always held in firm contact with the peripheral surface of the cam N⁸. The spring N⁹ holds the jaw of the vise against the saw when the spring I⁴ is out of contact with the cam I⁵ and prevents the saw from feeding too far ahead or working up out of the jaws of the vise while the saw is feeding. When the carriage D reaches the end of its forward stroke, then the spring I⁴ moves from the high portion of the cam I⁵, so that the jaw I' opens, as previously described, at about the time the file H swings into an uppermost position. During the return stroke of the carriage the cam N⁸ imparts an upward swinging motion to the arm N⁷, so that a transverse swinging motion is given to the rock-arm N³ and the arm N' to cause the pawl N to push the saw H' transversely in the direction of the arrow b' to feed the saw forward the length of a tooth, and previous to the carriage D reaching the end of its stroke the spring I⁴ is engaged by the high portion of the cam I⁵, so that the jaw I' is moved into a closed position to securely clamp the saw H' in position between the jaws I I'. At the same time the arm N⁷ drops off the high portion of the cam N⁸ and swings downward, so that a return swinging motion is given to the rock-arm N³ and arm N' to cause the pawl N to glide over a tooth of the saw back to its forward position. Thus by the arrangement described a saw-tooth is filed during the forward stroke of the carriage D by the file H, and when the carriage D nears the end of its forward stroke the file H is thrown back from the cutting-point of the tooth, and then the file is raised completely out of engagement with the saw, and during the return stroke of the file the saw is unclamped and fed transversely, so as to bring a succeeding tooth in proper position for the next stroke of the file, the saw being again clamped securely in position prior to the carriage D making its next forward stroke, as previously explained. By causing the file H to leave the tooth in the manner described very accurate filing of the tooth is possible.

By the arrangement of the sockets on the file-holder G and the spring G⁷ for drawing the socket G⁴ toward the other socket G⁵, I am enabled to readily accommodate large and small files, and at the same time the files can be readily changed whenever desired.

By adjusting the tension of the spring K⁷ more or less pressure can be given to the file-holder G and the file H, so that use can be

made of sharp or dull files, the pressure on the file-holder being regulated by adjusting the tension of the spring K⁷ accordingly. It is further understood that by having the universal joint F the file-holder G can readily swing downward or upward or sidewise to bring the file H in the proper position relatively to the saw, as above described.

Having thus fully described my invention, I claim as new and desire to secure by Letters Patent—

1. A filing-machine having a reciprocating carriage, a file-holder, and a universal joint between the carriage and the file-holder, to allow the latter to swing in any direction and to move bodily with the carriage, as set forth.

2. A filing-machine having a reciprocating carriage, a file-holder, a universal joint between the carriage and the file-holder, to allow the latter to swing in any direction and to move bodily with the carriage, and an arm on the carriage for forming a rest for the file-holder, as set forth.

3. A filing-machine having a reciprocating carriage, a file-holder, a universal joint between the carriage and the file-holder, to allow the latter to swing in any direction and to move bodily with the carriage, and a movable arm on said carriage and having an incline to support said file-holder and to move the latter up or down or sidewise, as set forth.

4. A filing-machine having a reciprocating carriage, a file-holder, a universal joint between the carriage and the file-holder, to allow the latter to swing in any direction and to move bodily with the carriage, and a spring-pressed arm pivoted on the carriage and having a rest supporting an incline for engagement with the file-holder, to move the latter up or down or sidewise, as set forth.

5. A filing-machine having a reciprocating carriage, a file-holder, a universal joint between the carriage and the file-holder, to allow the latter to swing in any direction and to move bodily with the carriage, a spring-pressed arm pivoted on the carriage and having a rest supporting an incline for engagement with the file-holder, to move the latter up or down or sidewise, a crank-arm, and a pitman connected with said carriage, the pitman being arranged to engage the said pivoted arm, as set forth.

6. A filing-machine having a reciprocating carriage, a file-holder, a universal joint between the carriage and the file-holder, to allow the latter to swing in any direction and to move bodily with the carriage, an arm pivoted on said carriage, a spring pressing said arm, a tension device for said spring, to adjust the tension thereof, and a rest on the free end of said arm and having an incline for engaging the said file-holder, as set forth.

7. A filing-machine having a reciprocating carriage, a file-holder, a universal joint between the carriage and the file-holder, to allow the latter to swing in any direction and to move bodily with the carriage, an arm piv-

oted on said carriage, a spring pressing said arm, a tension device for said spring, to adjust the tension thereof, a rest on the free end of said arm and having an incline for
5 engaging the said file-holder, a crank-arm, and a pitman connected with said carriage, the pitman having a friction-roller engaging a depending arm on the previously-mentioned arm, as set forth.

10 8. A filing-machine having a file-holder, comprising a bar, a socket adjustably secured thereon, a socket slidable on the bar, a thimble carried by the slidable socket, and a spring connecting the sockets with each other, as
15 set forth.

9. A filing-machine having a file-holder, comprising a bar, a socket adjustably secured

thereon, a socket slidable on the bar, a thimble carried by the slidable socket, and a spring connecting the sockets with each other, the
20 spring having a loop for hooking into a hook on one of the sockets, as set forth.

10. A filing-machine having a fixed jaw, a movable jaw, a yoke fulcrumed on one of the jaws and having supports for supporting a saw
25 at the time the jaws are open, and means for adjusting the said yoke, as set forth.

In testimony whereof I have signed my name to this specification in the presence of two subscribing witnesses.

CHARLES YOUNG.

Witnesses:

ANDREW W. JUNKINS,
RUTHERFORD B. H. MOULTON.