

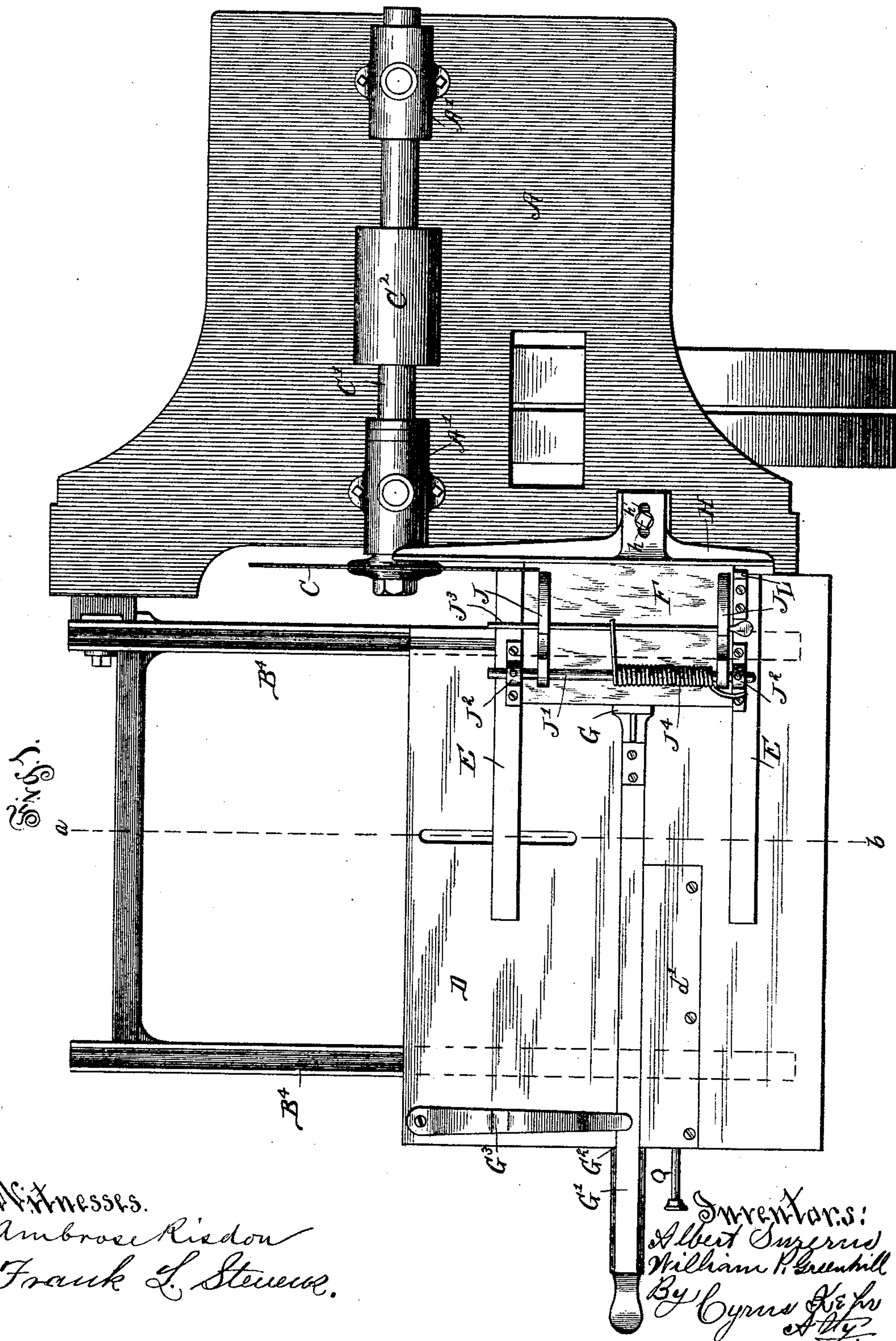
(No Model.)

5 Sheets—Sheet 1.

A. SURERUS & W. P. GREENHILL.
RESAWING MACHINE.

No. 500,167.

Patented June 27, 1893.



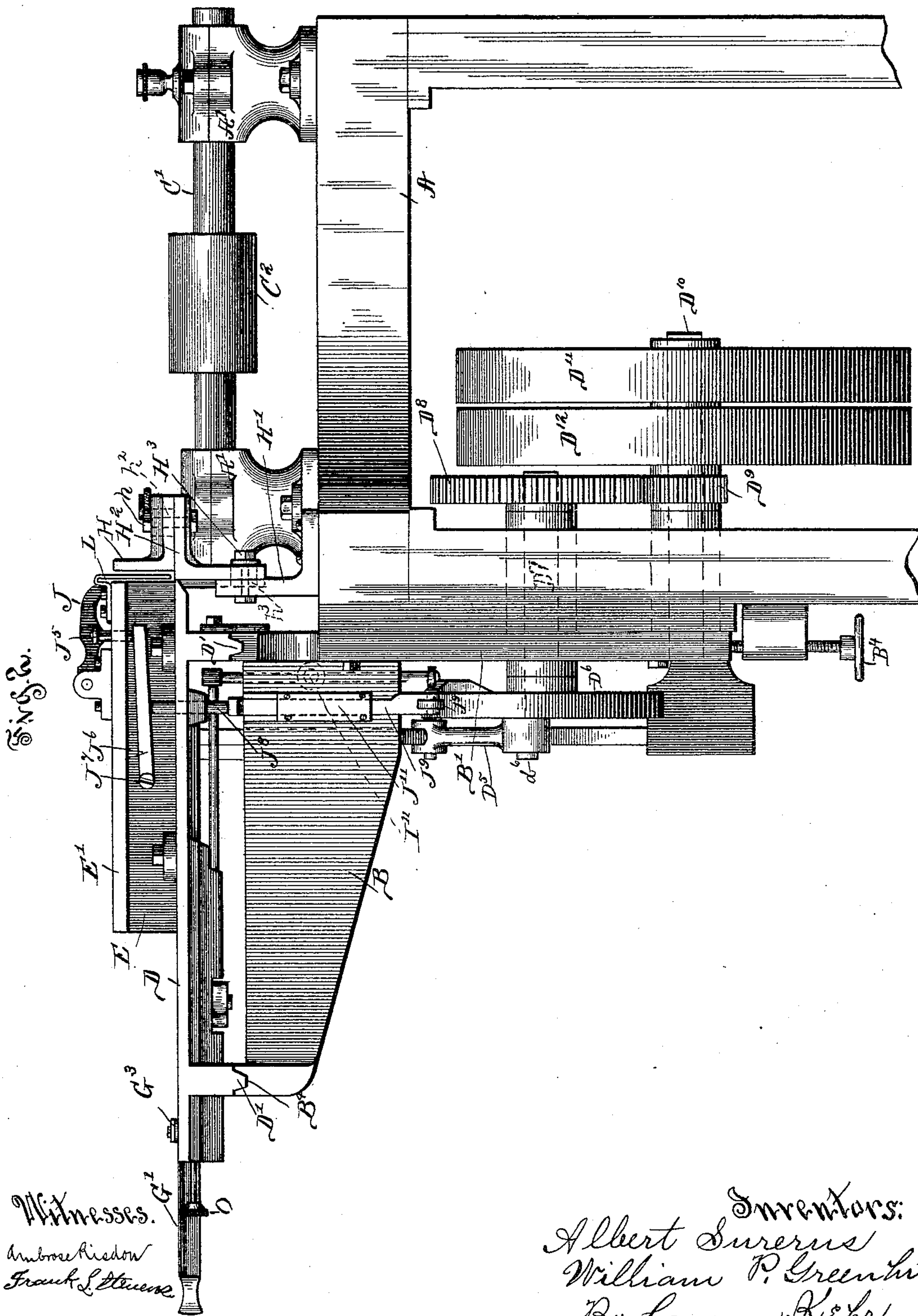
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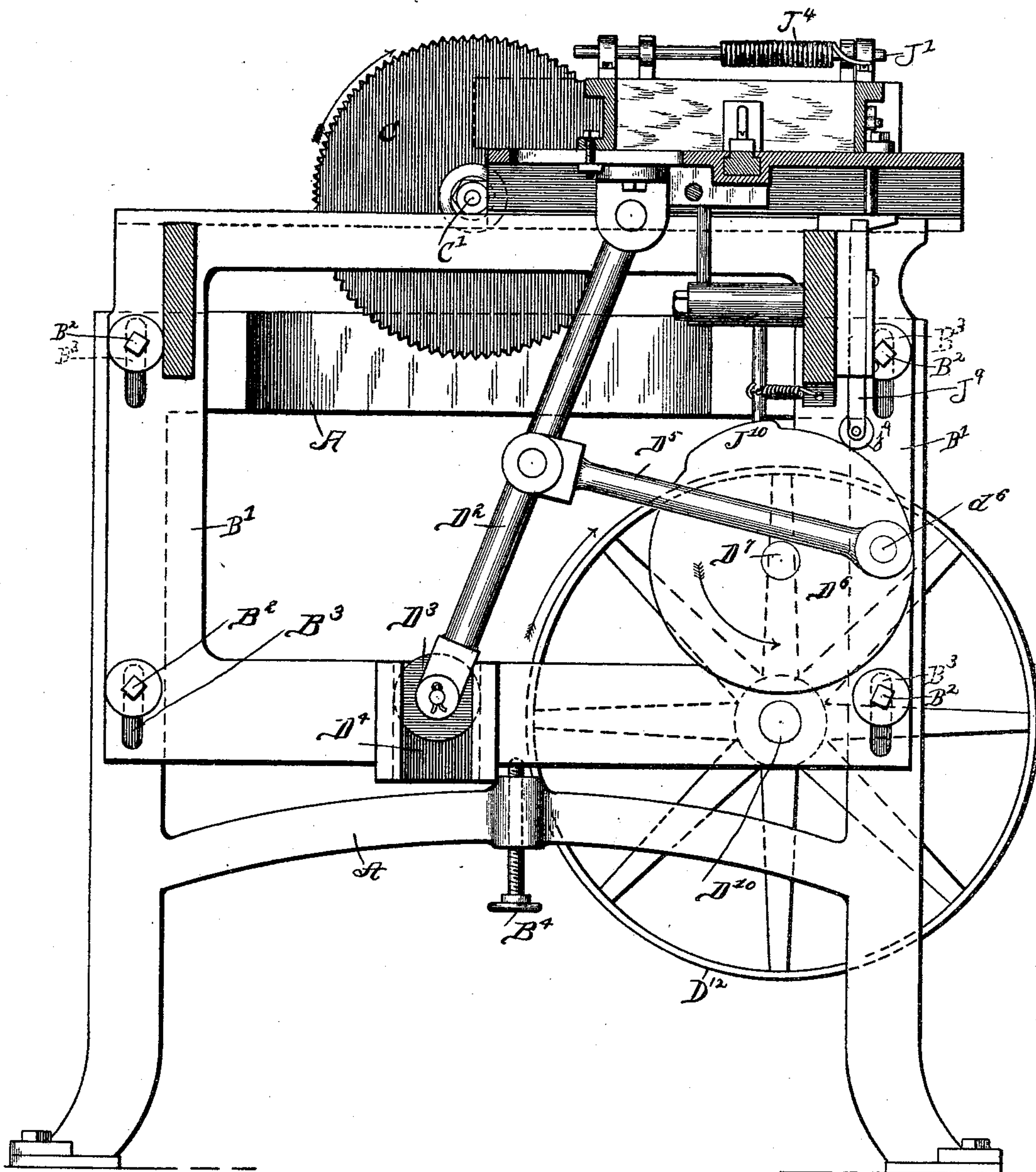
5 Sheets—Sheet 3.

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Fig. 3.



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Atty

No Model.)

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Fig. 4.

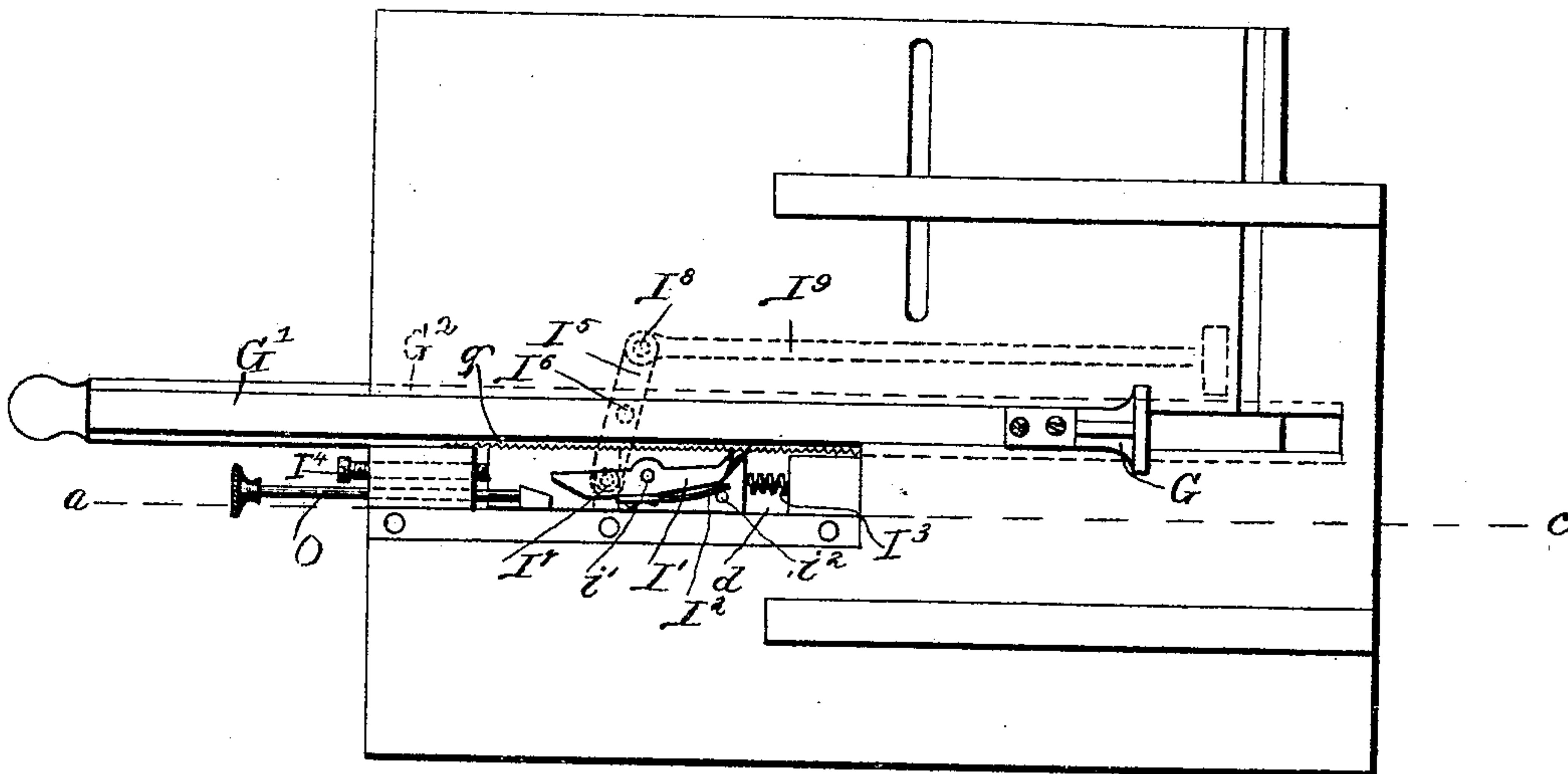
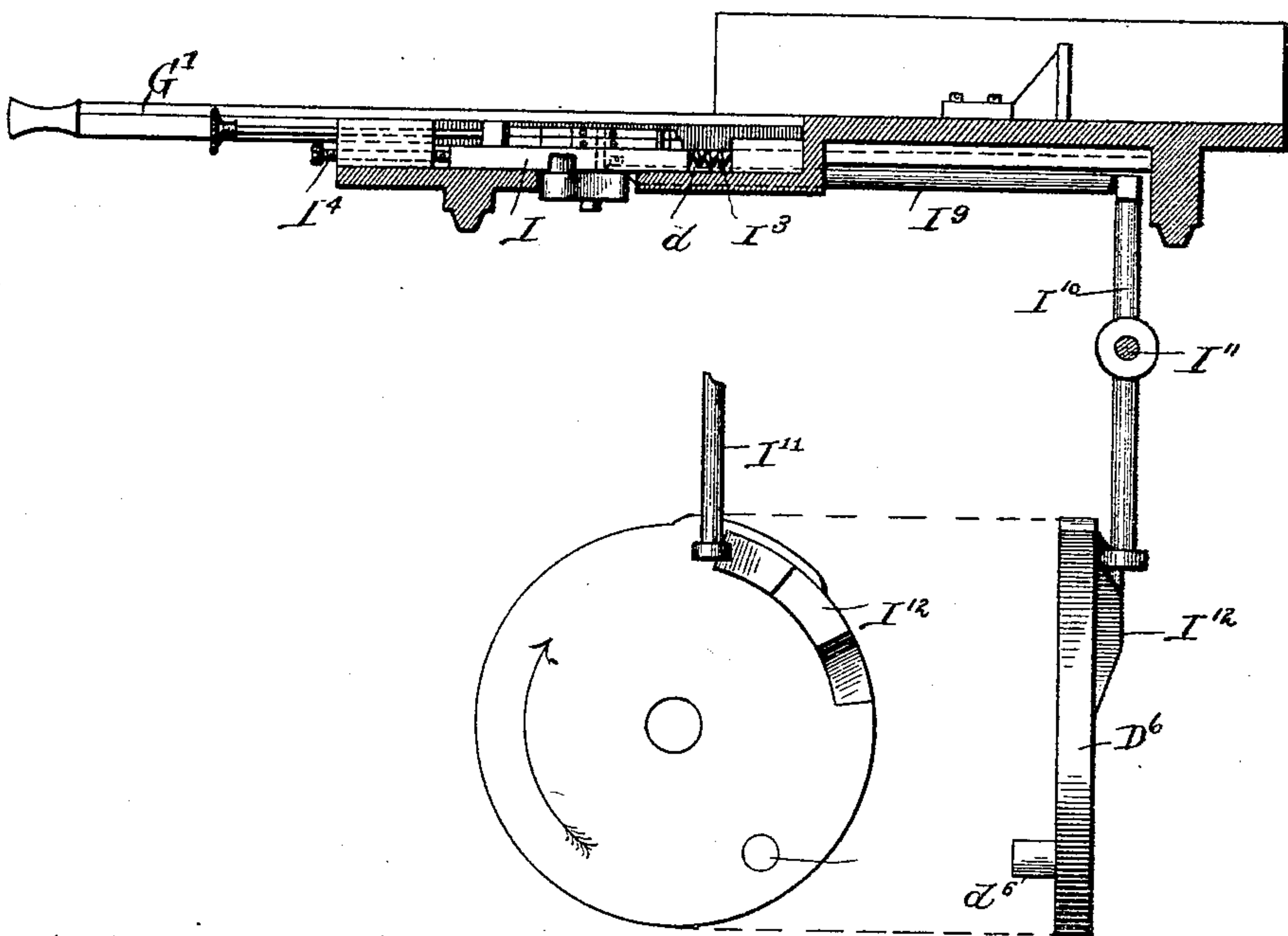


Fig. 5.



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(No Model.)

5 Sheets—Sheet 5.

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Fig. 6.

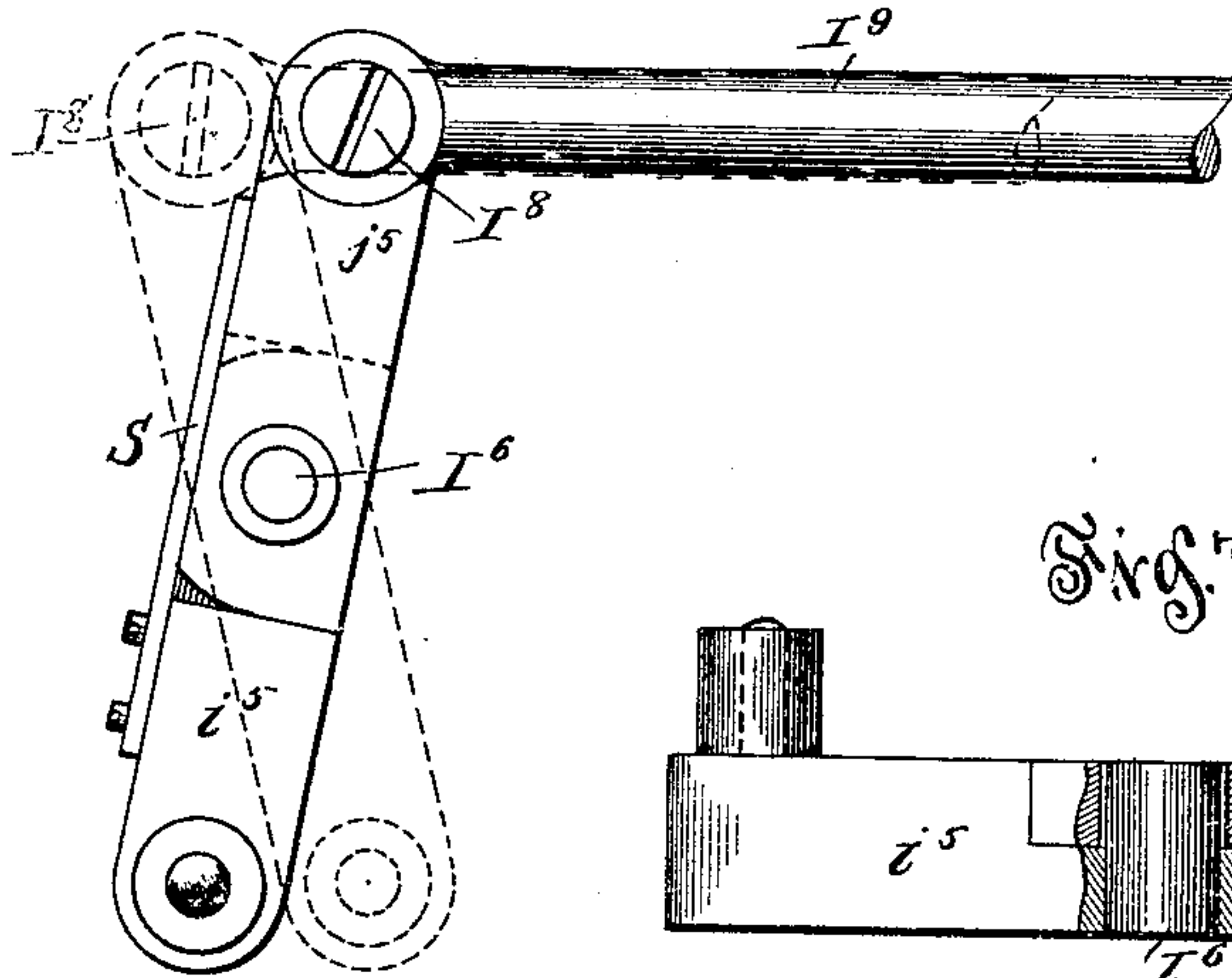


Fig. 7.

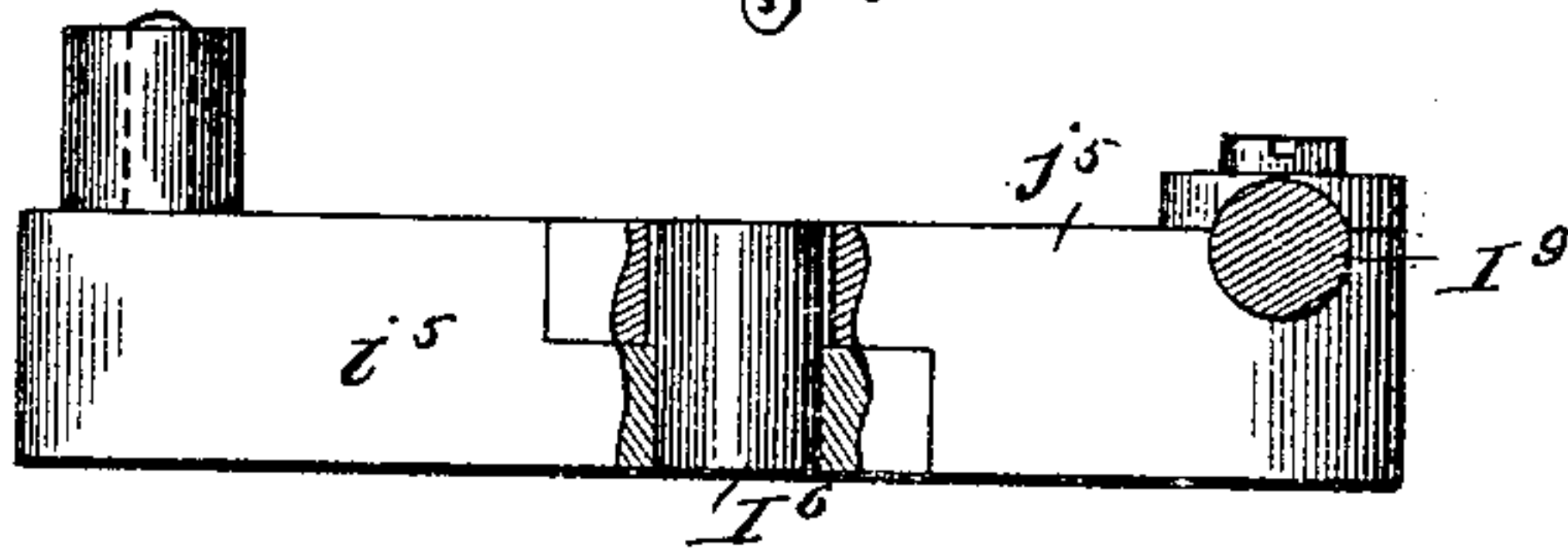


Fig. 8.

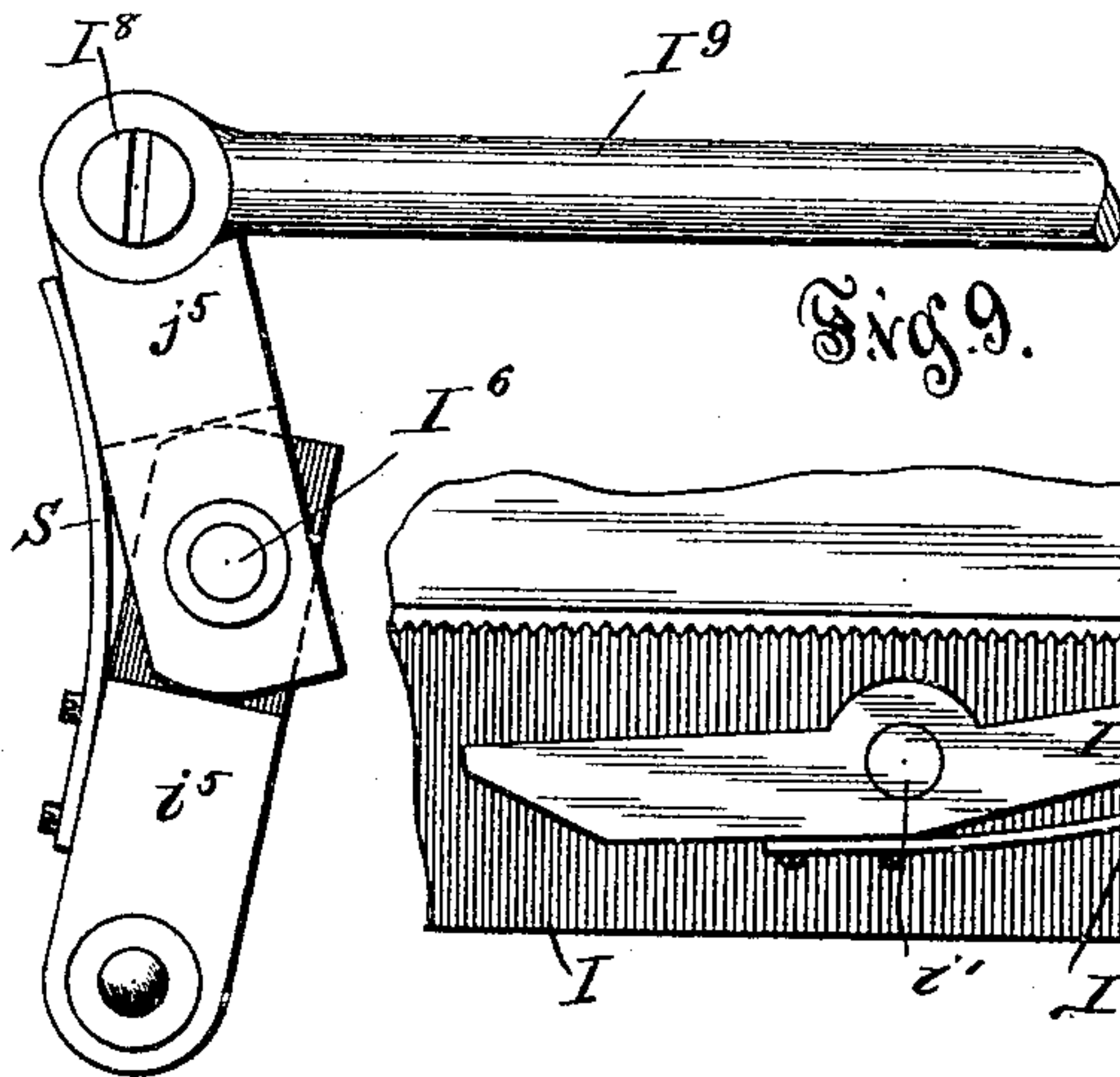


Fig. 9.

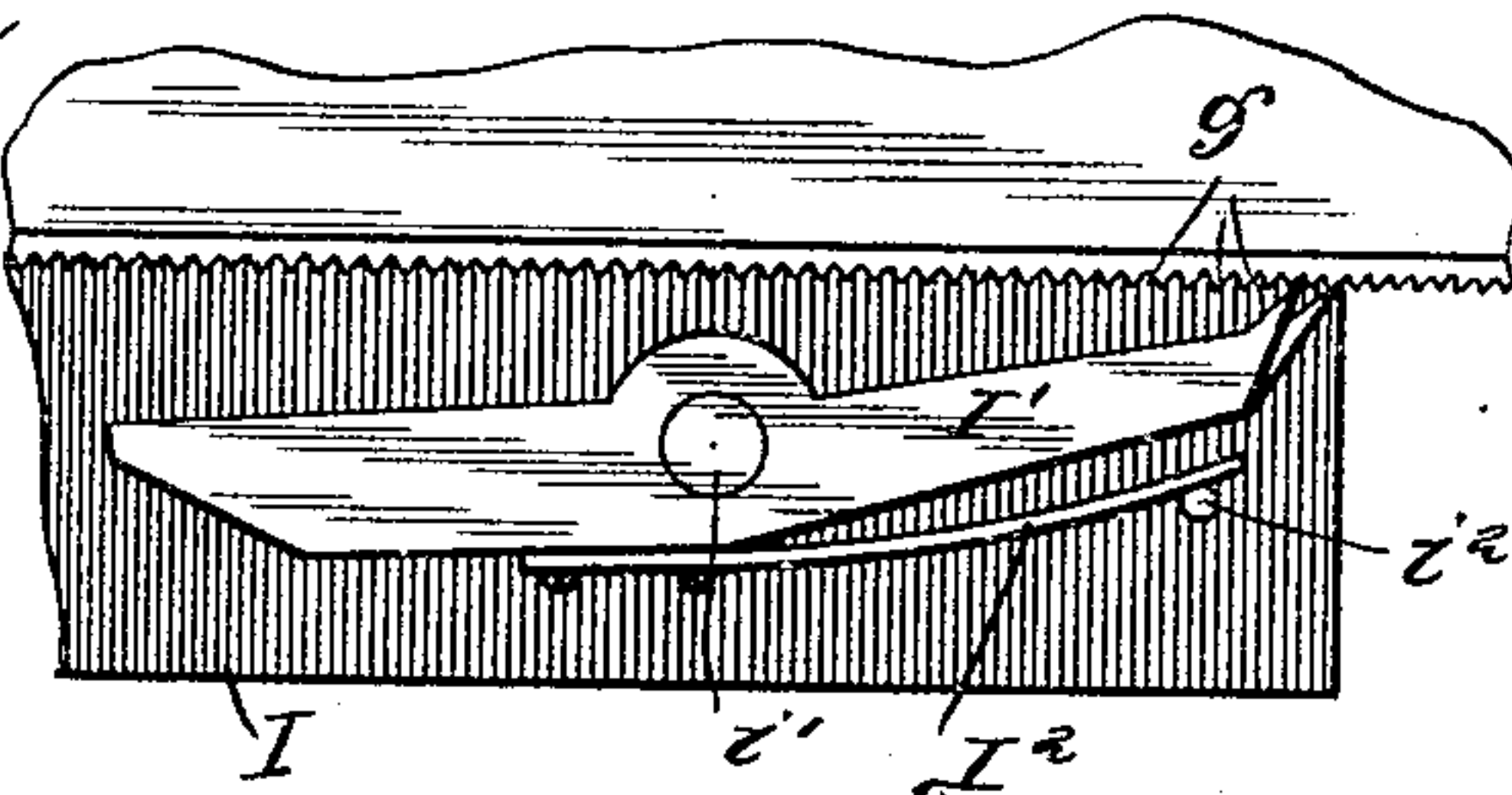
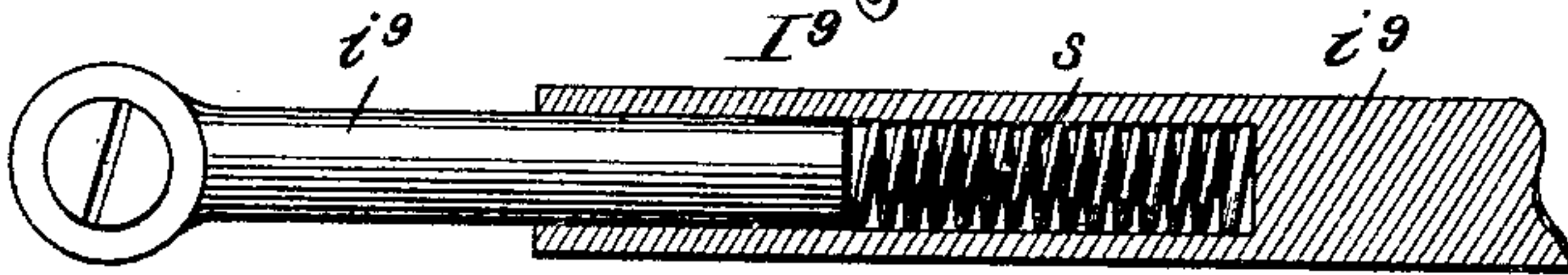


Fig. 10.



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UNITED STATES PATENT OFFICE.

ALBERT SURERUS AND WILLIAM P. GREENHILL, OF CHICAGO, ILLINOIS.

RESAWING-MACHINE.

SPECIFICATION forming part of Letters Patent No. 500,167, dated June 27, 1893.

Application filed November 10, 1891. Serial No. 411,469. (No model.)

To all whom it may concern:

Be it known that we, ALBERT SURERUS and WILLIAM P. GREENHILL, citizens of the United States, residing at Chicago, in the county of Cook and State of Illinois, have invented certain new and useful Improvements in Resawing-Machines; and we do hereby declare the following to be a full, clear, and exact description of the invention, such as will enable others skilled in the art to which it appertains to make and use the same, reference being had to the accompanying drawings, and to letters of reference marked thereon, which form a part of this specification.

Our improvement relates to a machine for sawing blocks of wood into relatively small strips of uniform thickness. Our machine is automatic in its operation. It is designed specially for sawing strips of wood to be used in the manufacture of lead-pencils and other like purposes requiring a precise thickness of the pieces of wood.

The machine comprises a saw, a carriage reciprocating automatically parallel to the plane of the saw, and automatic feed-mechanism supported by said carriage for feeding the block of wood forward into the path of the saw.

In the accompanying drawings—Figure 1 is a plan of the machine embodying our improvement. Fig. 2 is a front elevation. Fig. 3 is a vertical section in line *a—b* of Fig. 1. Fig. 4 is a plan of the carriage with a portion of the feed mechanism exposed. Fig. 5 is a section in the line *a—c* of Fig. 4. Figs. 6, 7, and 8 show details of the flexible lever which constitutes a part of the feed mechanism. Fig. 9 illustrates the pawl for progressing the follower. Fig. 10 shows a modification of the mechanism for progressing the follower.

In said drawings, A is the main frame, and B is the supplemental or carriage-supporting frame. Said supplemental frame is shown supported by the main frame A and provision is made for a vertical adjustment of the supplemental frame on said main frame. A vertical member B' constitutes a part of the supplemental frame B and is applied flatwise to one side of the main frame A and secured thereto by bolts B² extending through slots B³. A screw B⁴ may extend through a portion of the frame A below the middle of the

member B' of the frame B and in contact with said member, by means of which the frame B may be raised or lowered when the bolts B² are loose. Thus all the mechanism supported by said supplemental frame may be raised or lowered with reference to the frame A and the mechanism supported by said frame A.

C is the saw. This is supported upon the shaft C' which is in turn supported in bearings A' A'. A band-wheel C² is mounted upon the shaft C' to receive a band for the rotation of said shaft and saw.

B⁴ B⁴ are ways on the supplemental frame B parallel to each other and the plane of the saw C.

D is the carriage. This is provided with feet D' D' extending downward into the ways B⁴, so that said carriage may be reciprocated upon said supplemental frame in a direction parallel to the plane of the saw C. This reciprocation is effected automatically, as follows: An arm D² is hinged by its upper end to the bottom of the carriage D and by its lower end to a roller D³, which latter is confined in a vertical way D⁴. A pitman D⁵ is jointed by one end to the middle of the arm D² and by the other end to the wrist-pin *d*⁶ on the crank-wheel D⁶. Said crank-wheel is mounted on a shaft D⁷ which is supported in the frame B and which supports at its end opposite the wheel D⁶ a spur-gear D⁸, which spur-gear meshes into a spur-gear D⁹ on the driving-shaft D¹⁰ also supported by the frame B. Upon the driving-shaft D¹⁰ are mounted a fixed band-wheel D¹¹ and a loose band-wheel D¹² for receiving a belt for driving the carriage D and the feed-mechanism supported by the carriage. The rotation of the shaft D¹⁰ will obviously lead to the rotation of the crank-wheel D⁶ and the reciprocation of the pitman D⁵; and, since the shaft D² is hinged to the carriage D in the manner described, it follows that the upper portion of the shaft D² and the entire carriage D and the parts supported thereby will be reciprocated upon the ways B⁴ through a distance greater than the diameter of the circle described by the wrist-pin *d*⁶.

Upon the carriage D are fixed two guides which are vertical, parallel to each other, and at right angles to the plane of the saw and far enough from each other to receive be-

tween them the blocks which are to be re-sawed. F is such a block.

G is a follower arranged to move along above the face of the carriage D behind the block F to advance the latter after each cut made by the saw.

G' is the follower-stem. This rests in a dove-tailed channel G² in the upper face of the carriage D.

G³ is a frictional presser finger secured by one end to the carriage D and bearing with its other end upon the upper face of the follower-stem G', in order that said stem and follower may not shift unless acted upon positively by the feeding mechanism or by the attendant. But, since the upper face of said follower stem is a plane surface, the follower may be moved in either direction by applying positive force, without lifting the presser finger.

H is a stop arranged parallel to the saw at the side of the latter opposite the table D away from said saw a distance equal to the thickness of the strips to be cut from the block F. Said stop is supported on a standard H' rising from the frame A. A vertical adjustment for said stop may be provided by applying to said standard H' a piece H² by means of a bolt H³ extending through relatively large openings h³ in said standard H' and said piece H². A horizontal adjustment of the stop H may be afforded by providing the piece H² and the stop with horizontal meeting faces and a bolt h extending through relatively large openings h² in said stop and said piece H². By means of this vertical adjustment, the stop may be made to conform to the height of the carriage D when the latter is varied by a vertical adjustment of the supplemental frame B, as already explained. By means of the horizontal adjustment of the said stop, the machine may be set for sawing thin or thick strips from the blocks F.

The mechanism for automatically progressing the follower toward the stop H is located in and beneath the carriage D. At the front of the follower-stem G', the carriage D is provided with a recess d, as shown in Figs. 4 and 5, and covered with a plate d', as shown in Fig. 1. Said recess extends below the level of the follower-stem sufficiently to receive a block I with its upper face below a portion or all of the side of the follower-stem, so that a portion or all of the side of said follower-stem is exposed above said block. Upon said block is mounted one or more pawls I' on a vertical post i', so that the pawl or pawls will turn in a horizontal plane. The point of said pawl is directed forward toward the follower and pressed against the latter by means of a spring I² secured to said pawl by one end and bearing by the other end against a post i² rising from the block I. The portion of the follower G adjacent to said pawl is provided with teeth g, and the point of the pawl is pressed into engagement with said teeth. Said block I is

shorter than the recess d but fills the latter transversely excepting toward the top, as already stated, so that said block may be reciprocated longitudinally. From the foregoing it will be understood that the reciprocation of said block I will cause a forward movement of the follower G, for when said block is pushed forward toward the follower, said pawl will engage the teeth g and cause said follower and follower-stem to move toward the saw, while on a reverse movement of said block I the pawl will drag over the teeth g without sufficient engagement to move the follower and follower-stem in the reverse direction. This reverse movement is the more certainly precluded by the pressure of the presser-finger G³. The return of said block I is effected by a spring I³, located in front of said block and bearing against the front wall of the recess d. Said reverse movement of said block may be limited and varied by the adjusting-screw I⁴, extending through the left end of the carriage into the recess d and into the path of the block I. The teeth g extend only far enough toward the left end of the follower to insure the movement of the latter only to but not into the path of the saw.

I⁵ is a rocking member secured between its ends flatwise beneath the follower to a relatively fixed portion of the carriage at a point I⁶, and one end of said rocking-member is hinged to the block I at I⁷ and the other end is hinged to a reciprocating shaft I⁹ at I⁸. Said reciprocating shaft I⁹ extends into the path of one end of a rocking member I¹⁰ which is pivoted at its middle to a relatively fixed portion of the supplemental carriage at I¹¹, and the opposite end of said member reaches into the path of a cam-face I¹² on the crank-wheel D⁶. When said cam-face passes the lower end of said member I¹⁰, said lower end is thrown toward the right or head of the machine and the upper end of said member is thrown toward the left or foot of the machine and against the reciprocating shaft I⁹, so that the latter turns the member I⁵ upon the pivot at I⁶, whereby the block I and pawl I' are thrown forward. When said cam-face I¹² has passed said member I¹⁰, the coiled-spring I³ presses the block I⁴ backward or toward the left and reverses the movement of the member I⁵ and the reciprocating shaft I⁹. The cam face I¹² is so timed as to operate the pawl or pawls I' immediately upon the completion of the forward movement of the carriage D in response to the action of the crank-wheel D⁶ and the pitman D⁵; for at this time the block F is forward out of the range of the saw so that it may be moved against the strip H without touching the saw. The distance to which the shaft I⁹ and the rocking member I⁵ are adapted to throw the pawl I' is a little in excess of what is required to progress the block F for cutting the thickest strips, so that the follower will always tend to push the block F farther than required for the desired thickness of cut and farther than permitted by the

stop H. But the train of connection between the wheel D⁶ and the pawl I' is made yielding at any suitable point to such a degree as that when the block F has been driven against the stop H so that the follower G can progress no farther, said connection will yield in response to the power transmitted from the wheel D⁶, all the parts between said yielding point and the pawl I' remaining stationary and the parts between said point and the wheel D⁶ moving as before. Figs. 6, 7, and 8 show said yielding point in the locking member I⁵, said member being divided transversely into two sections i⁵ hinged to each other by the bolt I⁶. The spring S secured by one end to the side of one of the sections i⁵ opposite the reciprocating shaft I⁹ and bearing by its opposite end against the corresponding end of the other section i⁵ normally keeps said sections i⁵ in line, as shown in Fig. 6. But when the follower meets the resistance of the stop H, the reciprocating shaft I⁹ forces the section i⁵ to which said reciprocating shaft is directly attached against the spring S so as to bend the latter and permit the movement of said sections i⁵ and said reciprocating shaft without moving the other sections i⁵ and the pawl I'. Thus the reciprocating shaft I⁹ may always make a stroke which is slightly in excess of what is required for shifting the follower the desired distance, and if the strips cut from the block F are to be thin, only a limited portion of the stroke of the reciprocating shaft I⁹ will be actually used. The same result may be accomplished by making said reciprocating shaft yielding. Such a modification is shown in Fig. 10, in which said reciprocating shaft is divided into two sections i⁹, i⁹, one of which is hollow and opens toward the other and contains an expanding spring s and receives the end of the other section. Ordinarily said spring s will be expanded so that said reciprocating shaft will be of full length, but under excess of pressure said spring will become compressed so that the section i⁹ which is toward the head of the machine will progress toward the foot of the machine while the other section i⁹ remains motionless. Thus it will be seen that we use an automatically disengageable means for progressing the follower G.

It will be observed that the drawings show no attachment between the reciprocating shaft I⁹ and the rocking member I¹⁰. On the contrary, one only abuts against the other. This construction is adopted for the reason that the rocking member I¹⁰ is relatively stationary upon the supplemental frame B, while the reciprocating shaft I⁹ travels back-and-forth in a horizontal plane with the carriage D, the relative position of these parts being such as to bring said reciprocating shaft and said rocking member opposite each other into proper relation for engagement only when the cut has been completed and the carriage D has been shifted forward to its full limit. On reflection, it will be understood that no en-

gagement between said rocking-member and said reciprocating shaft is required excepting when the carriage D is at its forward limit; for it is only at this time that the block F is to be progressed by the follower G. Thus it will be seen that the train of mechanism intervening between the crank-wheel D⁶ and the follower G is not only automatically yielding or disengageable during the period of operation, but becomes entirely disconnected during each reciprocation of the carriage D.

O is a key extending into the recess d through the end of the carriage D the farther from the saw C in close proximity to the pawl I' at the side of the latter opposite the follower-stem G'. When said key is pushed inward it comes into contact with the adjacent end of the said pawl and forces said end toward and the opposite end from the follower-stem, so that said stem is no longer engaged by said pawl and may be retracted by the hand of the attendant to make room to set the follower to receive a new block F.

In addition to the guides E E and the follower G for controlling the block F, we have provided automatic, intermittent means for pressing and clamping said block F down upon the upper surface of the table D.

J J are fingers resting with their front ends upon the block F and secured by their rear ends to the shaft J' which is mounted in bearings J² on the guides E E.

J³ is a rod arranged parallel to the rod J' and extending through or attached to the fingers J J and projecting at the front through the adjacent finger J and resting above the adjacent guide E. A coiled spring J⁴ surrounds the shaft J' and is engaged by one end with the guide E or other relatively fixed part of the carriage and by the other end with the shaft J³ and bears downward upon said rod J³ sufficiently to turn said fingers J downward and clamp them upon the upper surface of the block F. Under these conditions, the block F is engaged at all sides. This clamping of said block by the downward pressure of said fingers is particularly helpful in maintaining the fixed position of said block while the saw is making a cut. It will be seen that a strip cannot be accurately cut from said block unless the latter is maintained in a fixed position with reference to the carriage D. But this clamping must cease after a cut has been made by the saw, in order that the follower G may progress said block into new contact with the stop H, and must then be resumed. We have provided automatic means for raising said fingers J immediately after each cut is completed and before the pawl I' is set into motion for progressing the follower G. For this purpose a train of mechanism is arranged between said fingers and the crank-wheel D⁶.

J⁵ is a vertical post extending loosely through the laterally-directed flange E' at the top of the front guide E, the bearing end of said post being directly beneath the end of

the rod J^3 while the other end is directly above a horizontal lever J^6 free at the end which is below said post and hinged by the other end to the side of the guide E at J^7 .

5 J^8 is another vertical post located below the lever J^6 and extending loosely through the carriage D to a point a little above the supplemental frame B.

10 J^9 is a vertically-reciprocating shaft resting upon the periphery of the crank-wheel D^6 and arranged to be engaged by a cam-face J^{10} on said periphery, and preferably provided at its lower end with an anti-friction roller j^9 and confined by a plate J^{11} , which is secured to
15 the supplemental frame B. At its upper end said shaft J^9 , extends to the level of the lower end of the post J^8 and stands directly beneath the latter when the carriage D stands at its forward limit of movement. Consequently,
20 the post J^8 , lever J^6 , post J^5 , arm J^3 , and fingers J are raised when the carriage D has arrived at its forward limit of movement and at the time when the follower G progresses the block F into contact with the stop H. The length
25 of the cam-face J^{10} is sufficient only to cause said fingers J to be raised during the interval required for such progression of the block F. It is to be noted that there is no permanent connection between the post J^8 and the shaft
30 J^9 , and such a connection is not desired, for the post J^8 travels back-and-forth horizontally with the carriage D, while said shaft J^9 , is relatively stationary. Thus said post and said shaft come into line with each other only once
35 during each reciprocation of the carriage D.

L is a finger secured to the upper portion of the guide E and extending toward the stop H and thence downward past the end of the guide E in a plane between the plane of the
40 saw and the adjacent face of the stop H, so that said finger may rest in contact with the portion of the block F which is being cut from said block. The purpose of this finger is to avoid the strip being cut from the block from
45 breaking or splitting off before the saw has quite completed the cutting. Said finger also serves to insure the delivery of the strip beyond the saw at the rear of the machine.

We claim as our invention—

50 1. In a re-sawing machine, the combination with a saw supported from relatively stationary bearings, of a stop located at one side of the saw in a direction perpendicular to its axis and in a plane parallel to the plane of
55 the saw, a carriage arranged to automatically reciprocate in a direction parallel to the plane of the saw at one side of the latter opposite said stop and provided with automatic yielding feeding mechanism for intermittently progressing the block to be re-sawed against said
60 stop in a direction perpendicular to the plane of the saw, substantially as shown and described.

2. In a machine for re-sawing, the combination with a main frame supporting a saw,
65 of a supplemental frame secured adjustably

to said main frame, a carriage mounted upon said supplemental frame and provided with automatic mechanism for reciprocating it in a direction parallel to the plane of the saw,
70 and automatic feed mechanism for intermittently progressing the block to be re-sawed toward the saw, substantially as shown and described.

3. In a machine for re-sawing, the combination with a main frame supporting a saw,
75 of a supplemental frame secured adjustably to said main frame, a carriage mounted upon said supplemental frame and provided with automatic mechanism for reciprocating it in a direction parallel to the plane of the saw, and
80 automatic feed mechanism for intermittently progressing the block to be re-sawed toward the saw, and a stop for limiting the progression of said block, substantially as shown
85 and described.

4. In a re-sawing machine, the combination with a saw supported from relatively stationary bearings, of a stop located at one side of the saw in a direction perpendicular to its
90 axis, a carriage arranged to automatically reciprocate in a direction parallel to the plane of the saw at one side of the latter opposite said stop, guides located upon said carriage, and extending in a direction perpendicular
95 to the saw for confining the block to be re-sawed, a follower confined in ways upon said carriage perpendicular to the saw, yielding mechanism for intermittently progressing the
100 follower toward said stop, the several movable parts being so timed as to operate in due order of sequence, substantially as shown and described.

5. In a re-sawing machine, the combination with a saw supported from relatively stationary
105 bearings, of a carriage arranged to automatically reciprocate in a direction parallel to the plane of the saw, a follower G having a stem G' provided with teeth g , a shiftable pawl I' normally in engagement with said
110 teeth, and automatic yielding mechanism for reciprocating said pawl, and a stop H arranged in due relation to said saw and said follower, substantially as shown and described.

6. In a re-sawing machine, the combination
115 with a relatively movable saw and support for the block to be re-sawed, of a follower confined in a way at right angles to the plane of the saw, a movable pawl for progressing said follower, a key for forcing said pawl out of
120 engagement with said follower, yielding mechanism for reciprocating said pawl, and a stop arranged in suitable relation to said saw and said follower, substantially as shown and described.
125

7. In a re-sawing machine, the combination with a saw supported from relatively stationary bearings, the carriage D for carrying the block to be re-sawed, a stop arranged in suitable relation to said saw and said carriage,
130 and a finger L mounted upon said carriage in such position as to extend between said saw

and said stop during the movements of said carriage, substantially as shown and described.

8. In a re-sawing machine, the combination with the saw C, and stop H, and a support for the block to be re-sawed, of a follower G arranged in suitable relation to said support in a way perpendicular to the plane of the saw, and a yielding automatic reciprocating pawl for progressing said follower, of a frictional device for pressing upon said follower in order to prevent the movement of said follower without the application of positive force thereto, and yet permitting movement of the follower in either direction perpendicular to the plane of the saw when positive force is applied, substantially as shown and described.

9. In a re-sawing machine, the combination with a support for the block to be re-sawed of the follower G, and yielding follower-progressing mechanism arranged in suitable relation to said follower and comprising a reciprocating shaft I⁹, a rocking member, I¹⁰ arranged in suitable relation to said reciprocating shaft, and mechanism for actuating said rocking member, substantially as shown and described.

10. In a re-sawing machine, the combination with the carriage D supporting the block to be re-sawed and the follower G and a yielding follower-progressing mechanism comprising a reciprocating shaft, I⁹, and a rocking member, I¹⁰ arranged in suitable relation to said reciprocating shaft and mechanism for actuating said rocking member, substantially as shown and described.

11. In a resawing machine, the combination with the carriage D arranged to be reciprocated in a direction parallel to the plane of the saw and for supporting the block to be re-sawed, of the follower G supported by said carriage, and follower-progressing mechanism comprising a reciprocating shaft, I⁹, a rocking

member, I¹⁰, arranged to stand in opposition to said reciprocating shaft, I⁹, when the carriage is at one side of the saw in a direction perpendicular to the axis of the saw, and mechanism for at such time actuating said rocking member, substantially as shown and described.

12. In a re-sawing machine, the combination with the carriage D for supporting the block F, and carrying it parallel to the plane of the saw, a follower for progressing said block perpendicularly to the plane of the saw, and yielding mechanism for periodically progressing said follower, of pressing mechanism located above the position for said block and normally bearing toward the carriage D, and lifting mechanism also supported by said carriage in such relation to said pressing mechanism as to lift the latter when said lifting mechanism is raised, and movable mechanism located upon the frame of the machine independent of said carriage in such position as to adapt it to lift said lifting mechanism when said carriage is in the position requiring the progression of said block F toward the plane of the saw, substantially as shown and described.

13. In a re-sawing machine, the combination with the guides E and a support for the block to be re-sawed, of pressing mechanism located above the space for said block, and the cam-faced crank-wheel D⁶ and reciprocable mechanism between said crank-wheel and said presser, and suitable mechanism for rotating said crank-wheel.

In testimony whereof we affix our signatures, in presence of two witnesses, this 4th day of November, in the year 1891.

ALBERT SURERUS.
WILLIAM P. GREENHILL.

Witnesses:

D. FRANCES SEELEY,
CYRUS KEHR.