

No. 859,981.

PATENTED JULY 16, 1907.

L. A. SCHAEFFER.  
MACHINE FOR MAKING CIGARS.

APPLICATION FILED SEPT. 18, 1906. RENEWED DEC. 10, 1906.

11 SHEETS—SHEET 1.

Fig: 1

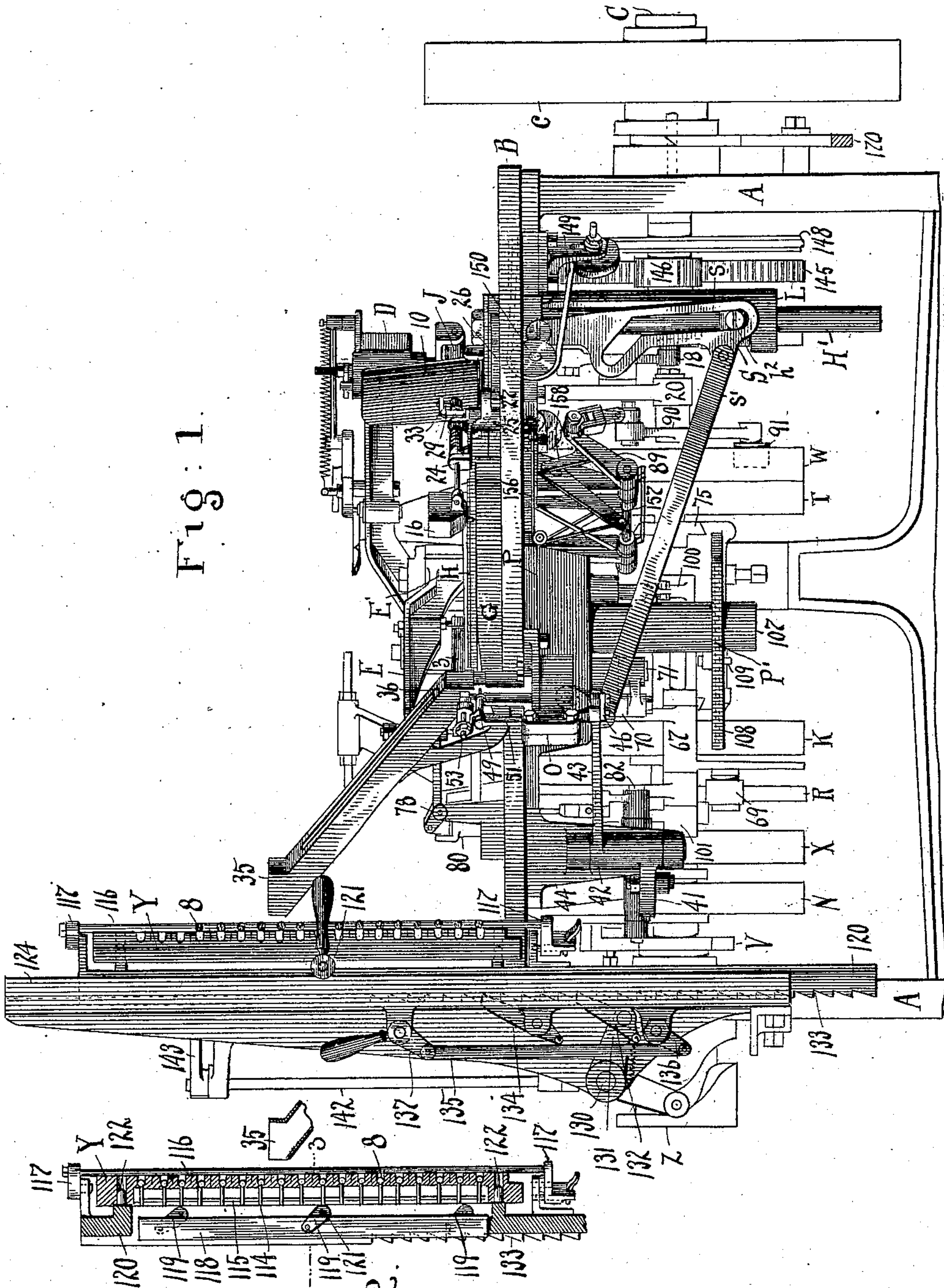


Fig: 2

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Fig. 4.

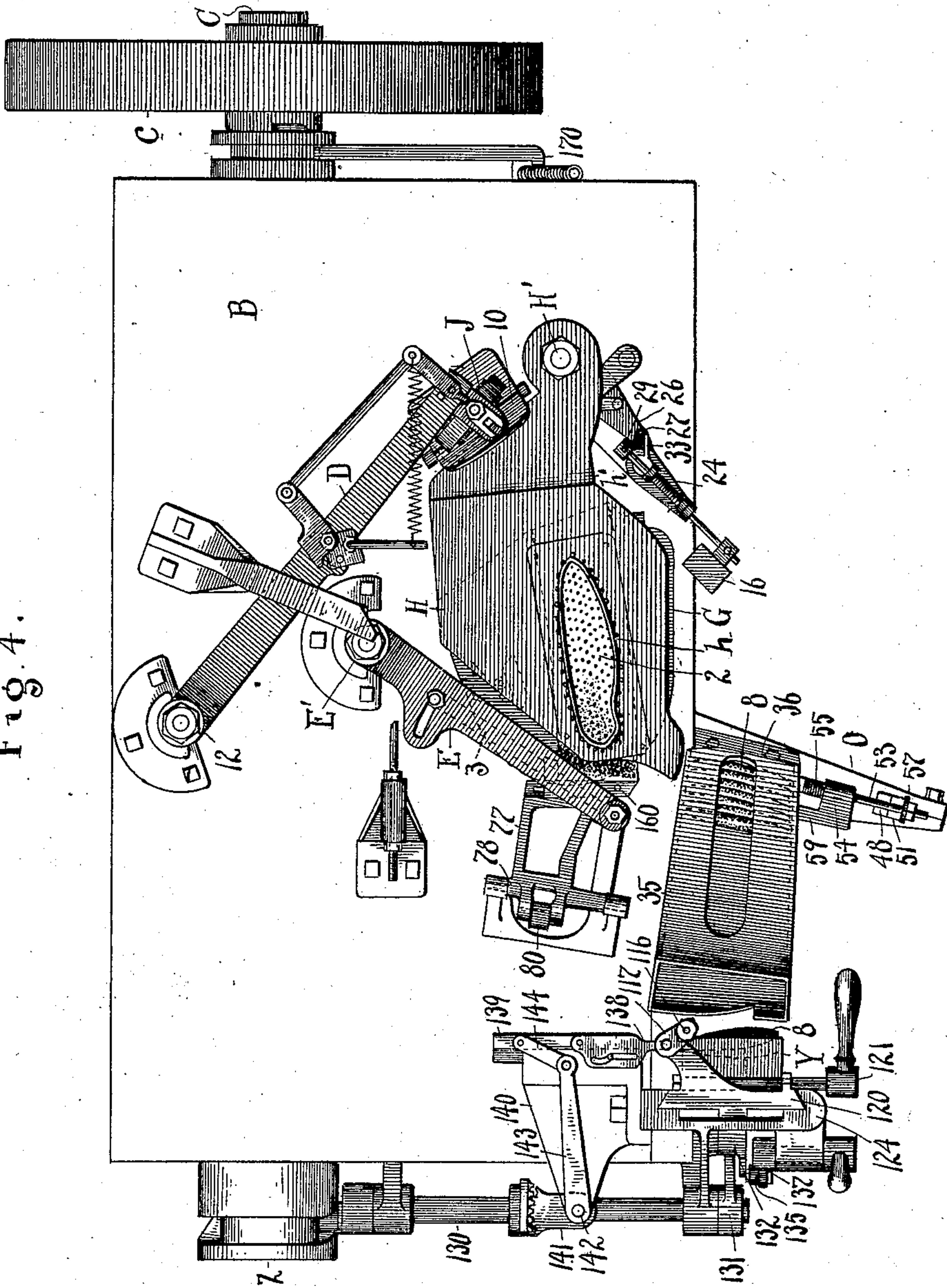
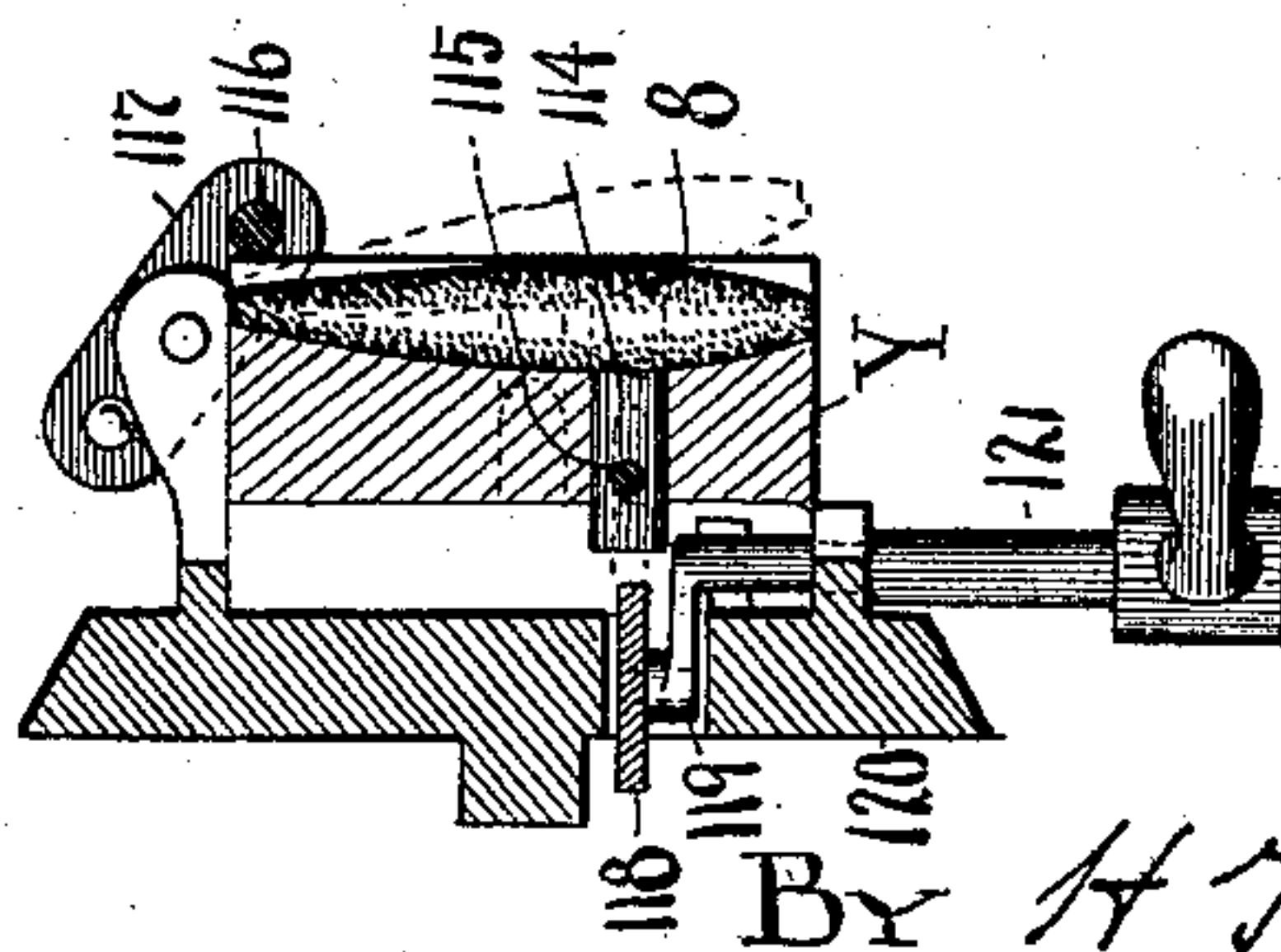


Fig. 3.



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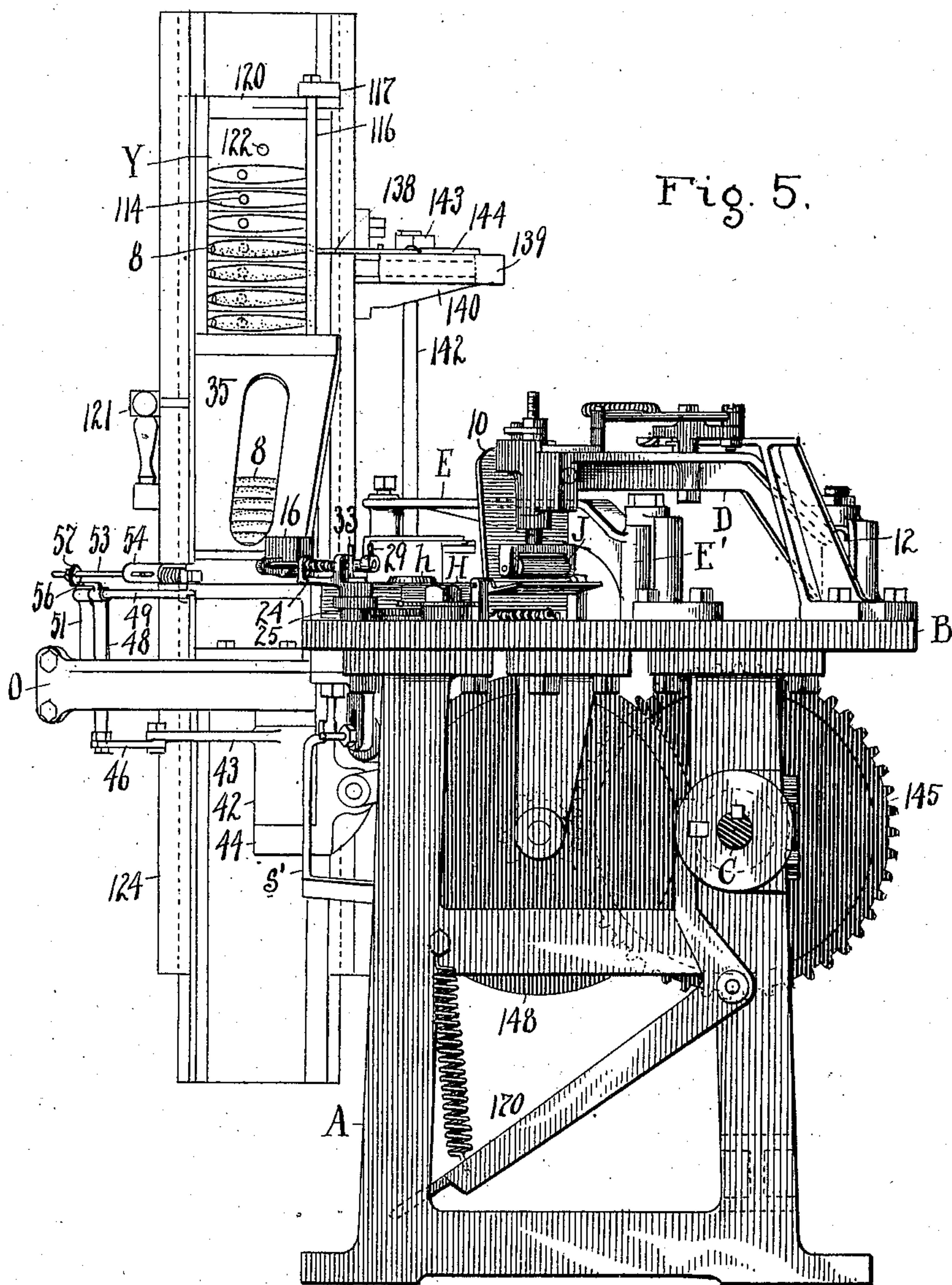
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11 SHEETS—SHEET 3.



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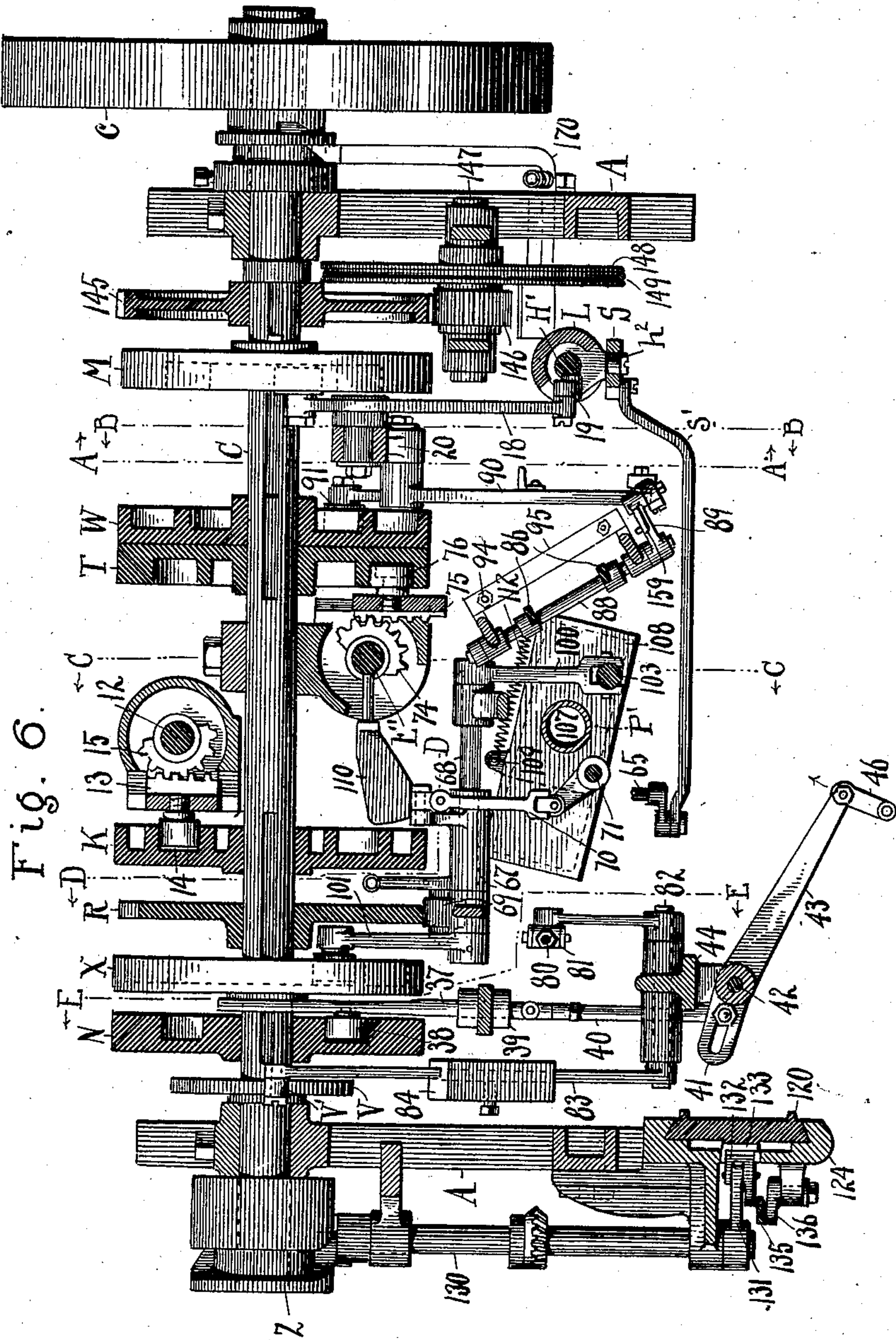
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11 SHEETS—SHEET 4.



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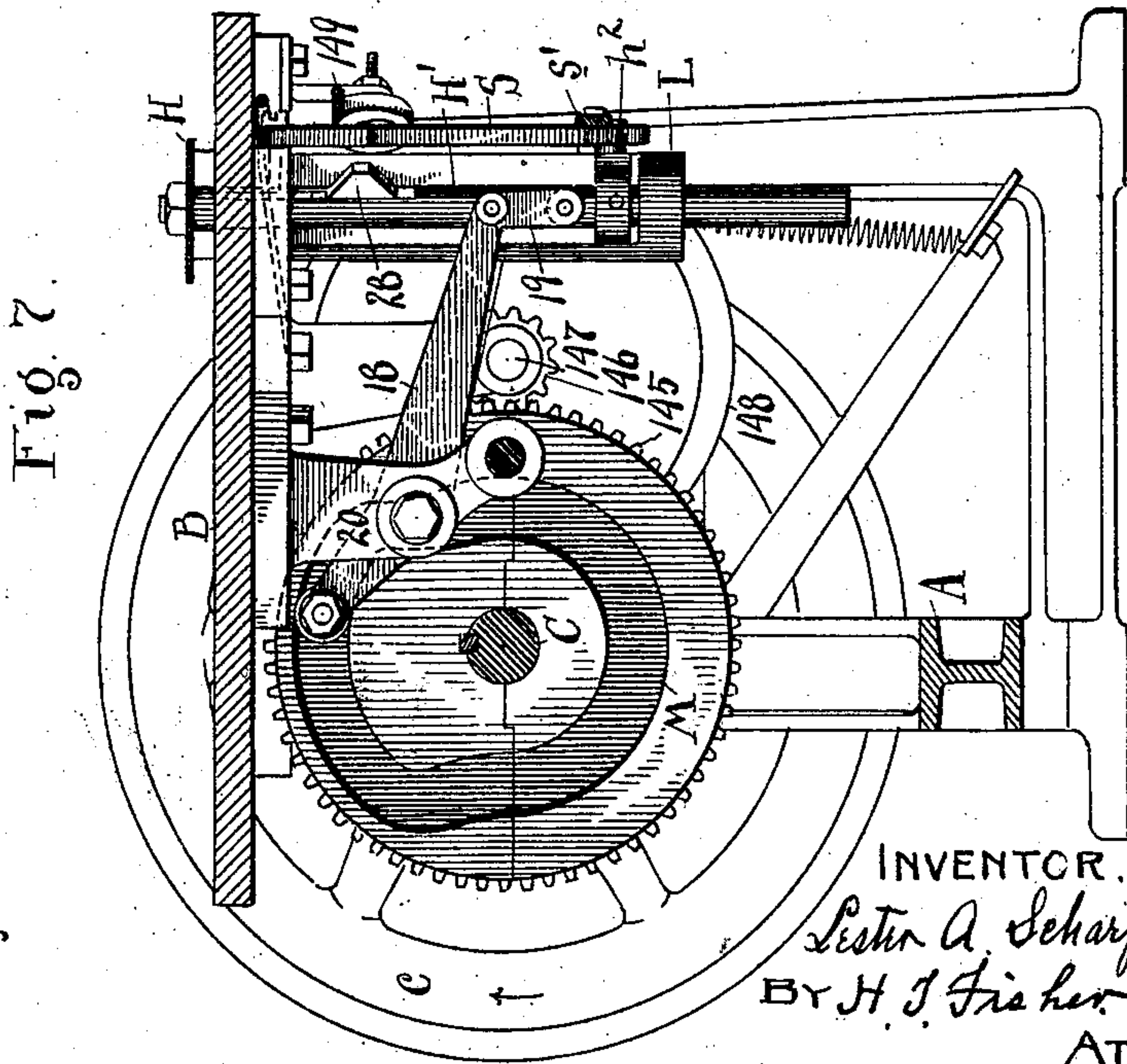
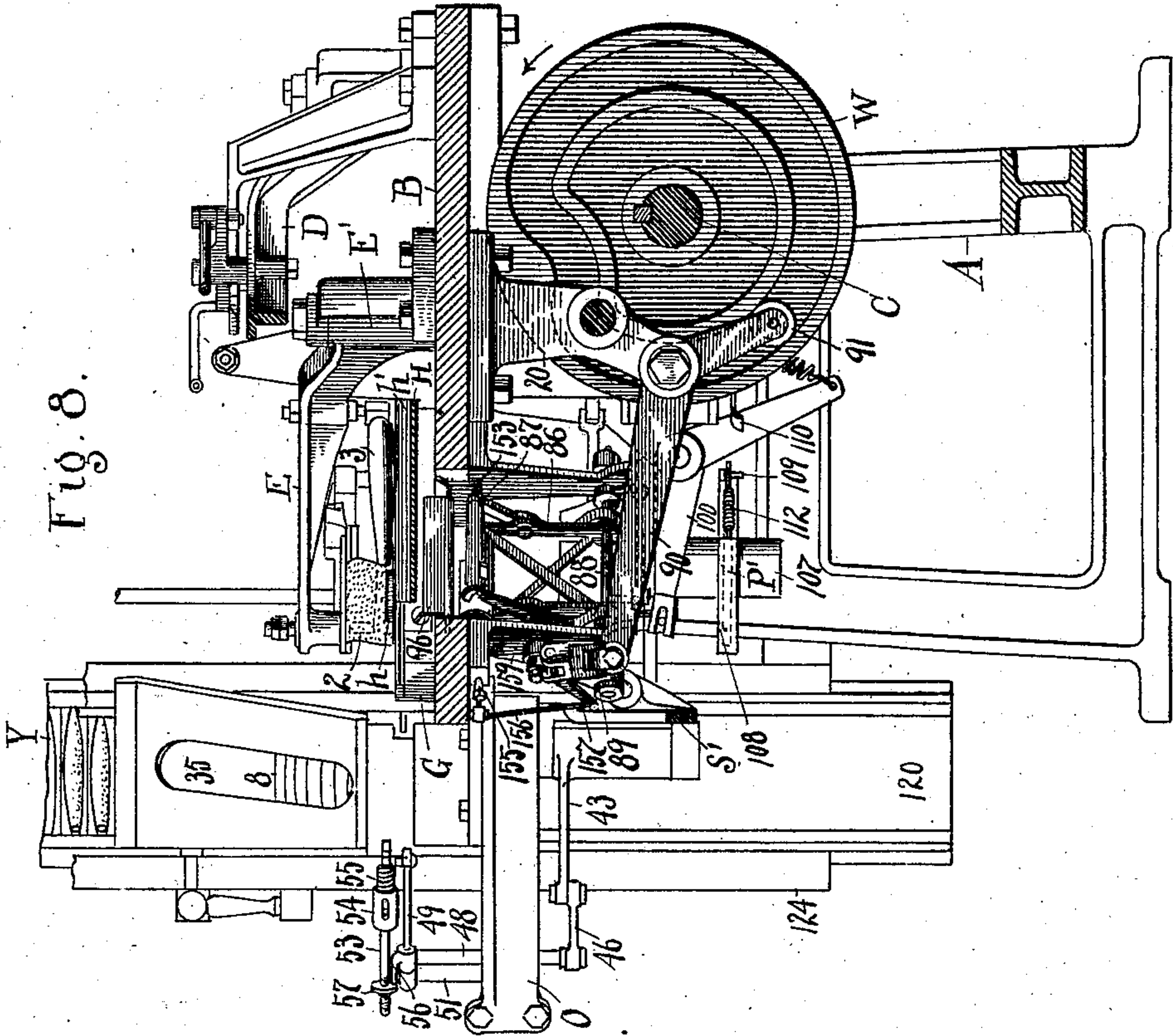
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11 SHEETS—SHEET 5.



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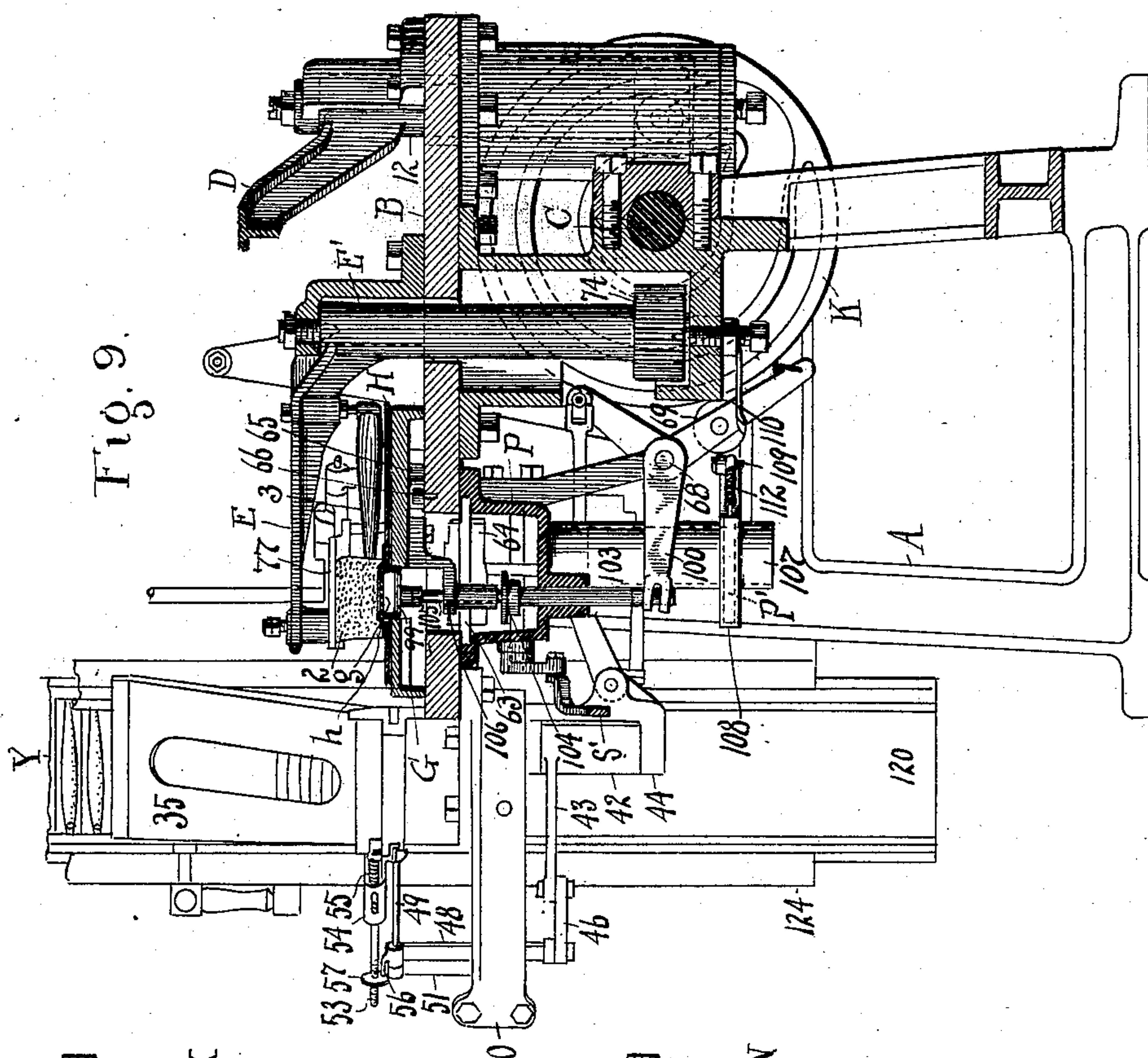
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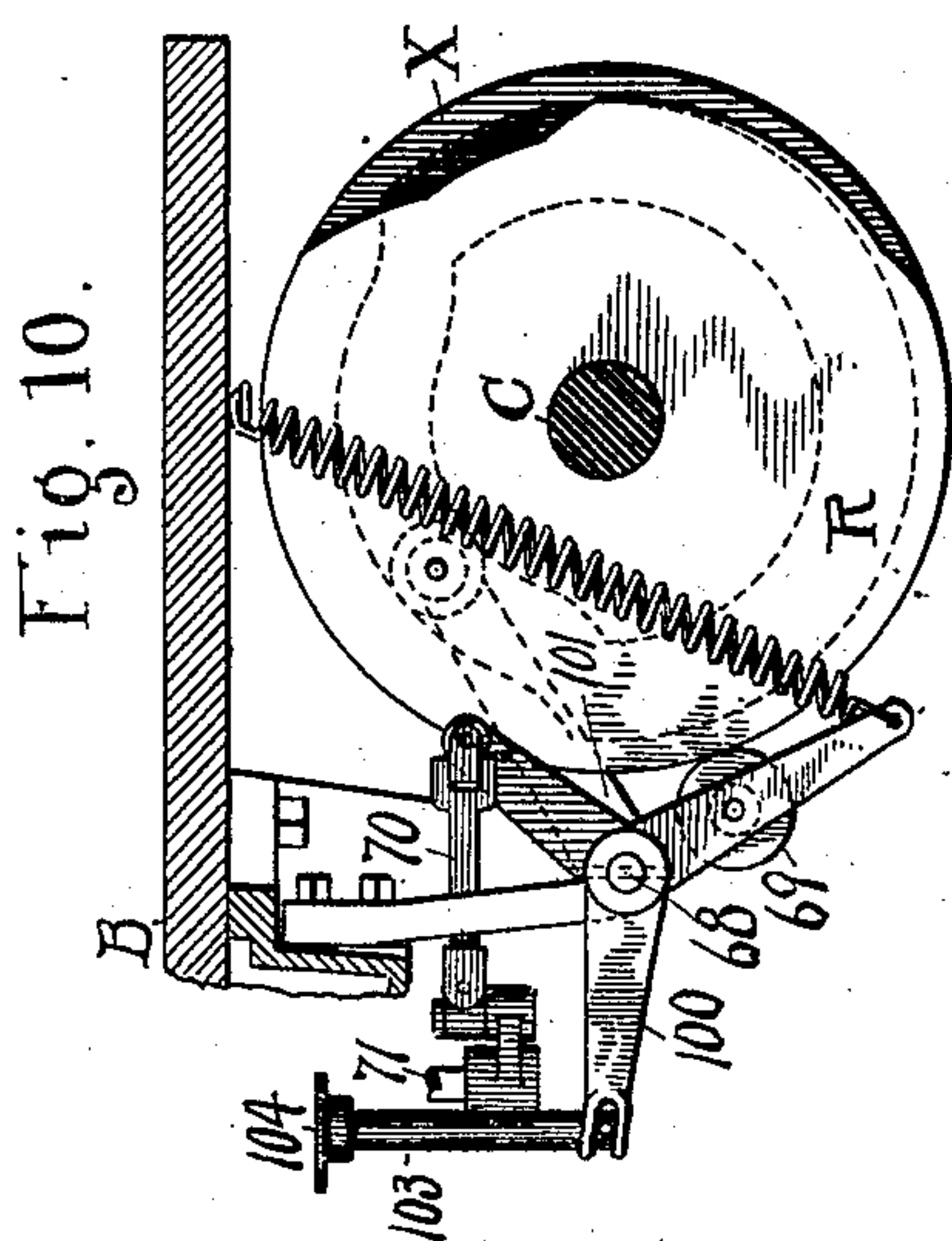


Fig. 10.

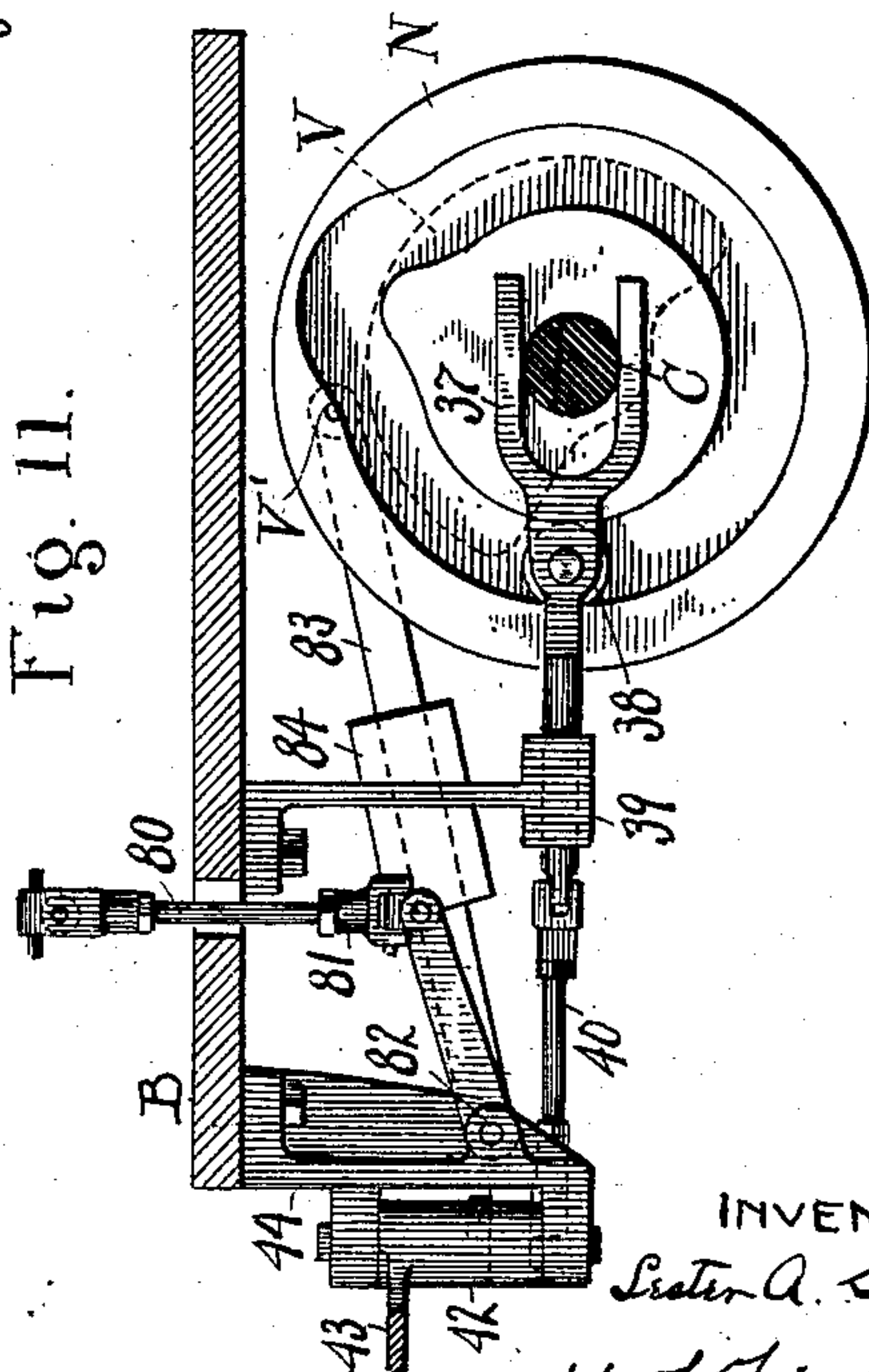


Fig. 11.

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No. 859,981.

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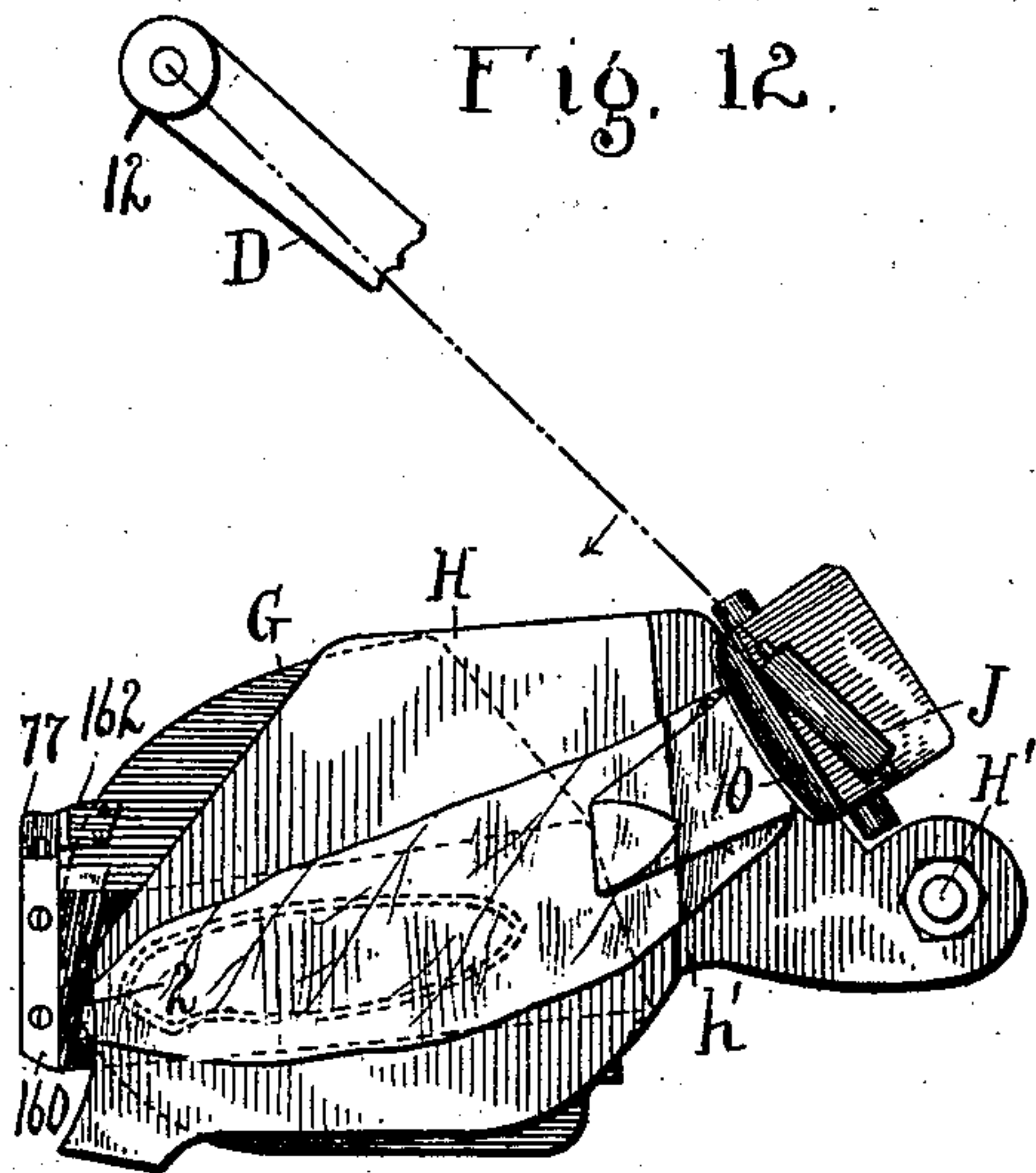


Fig. 12.

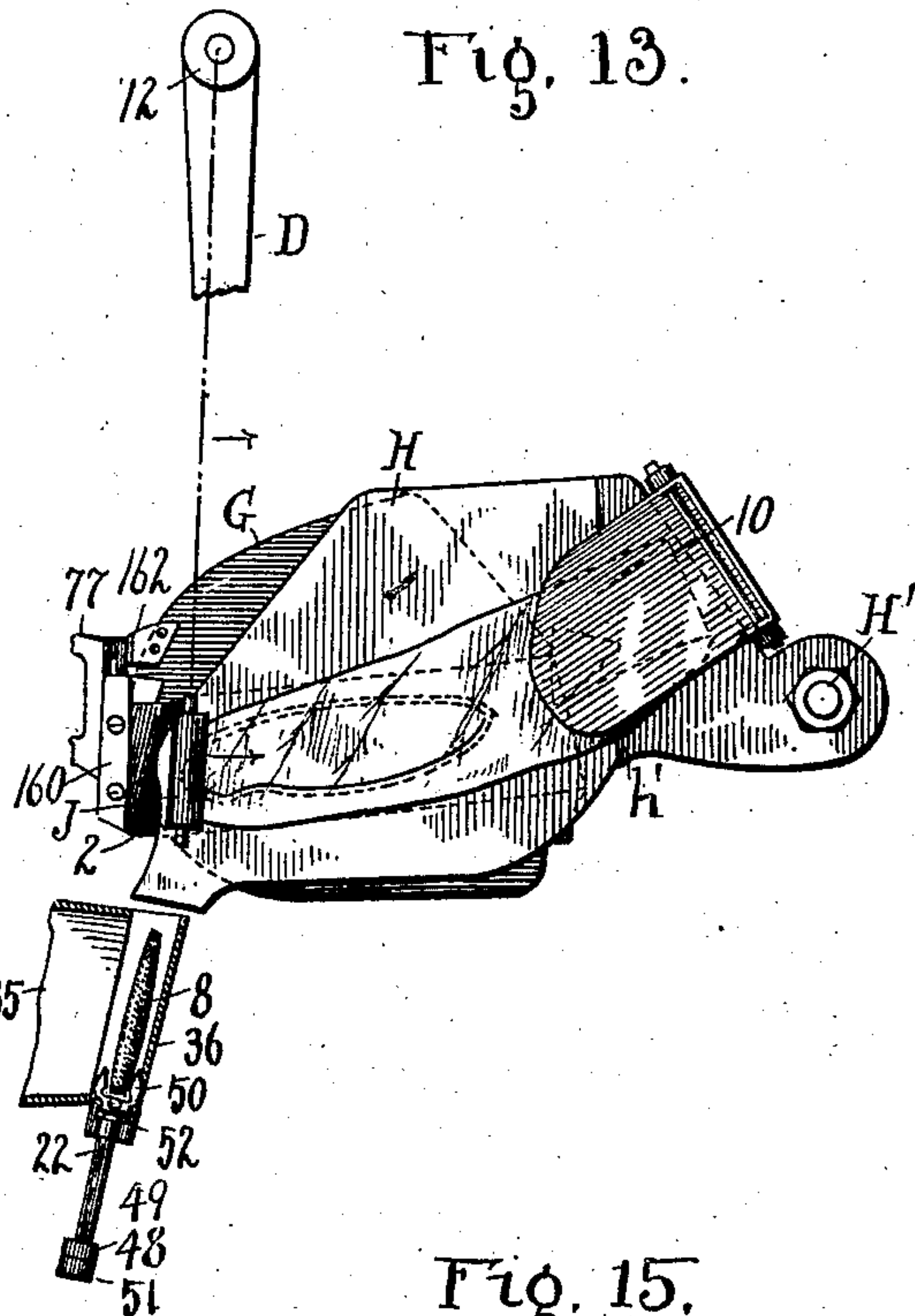


Fig. 13.

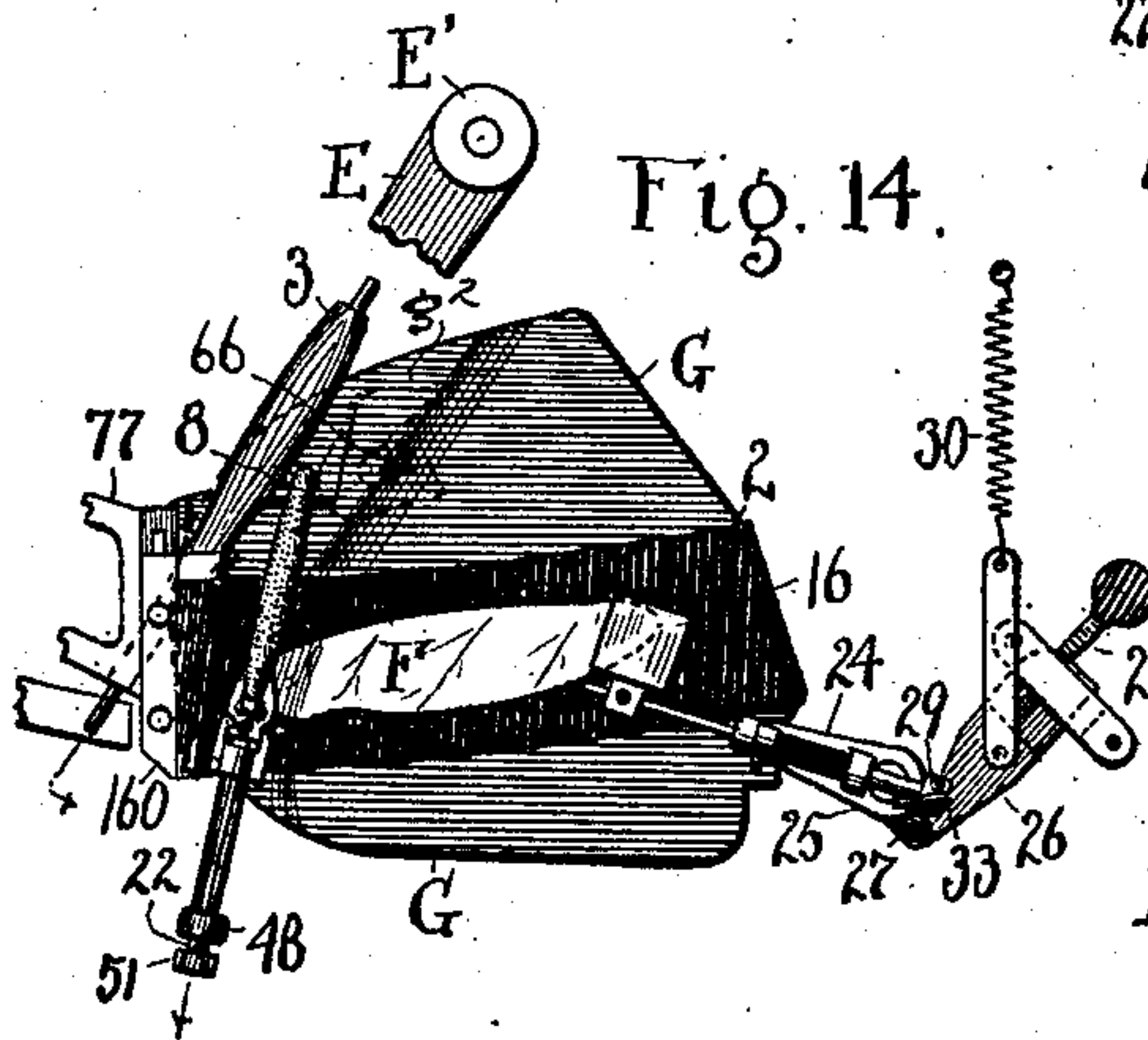


Fig. 14.

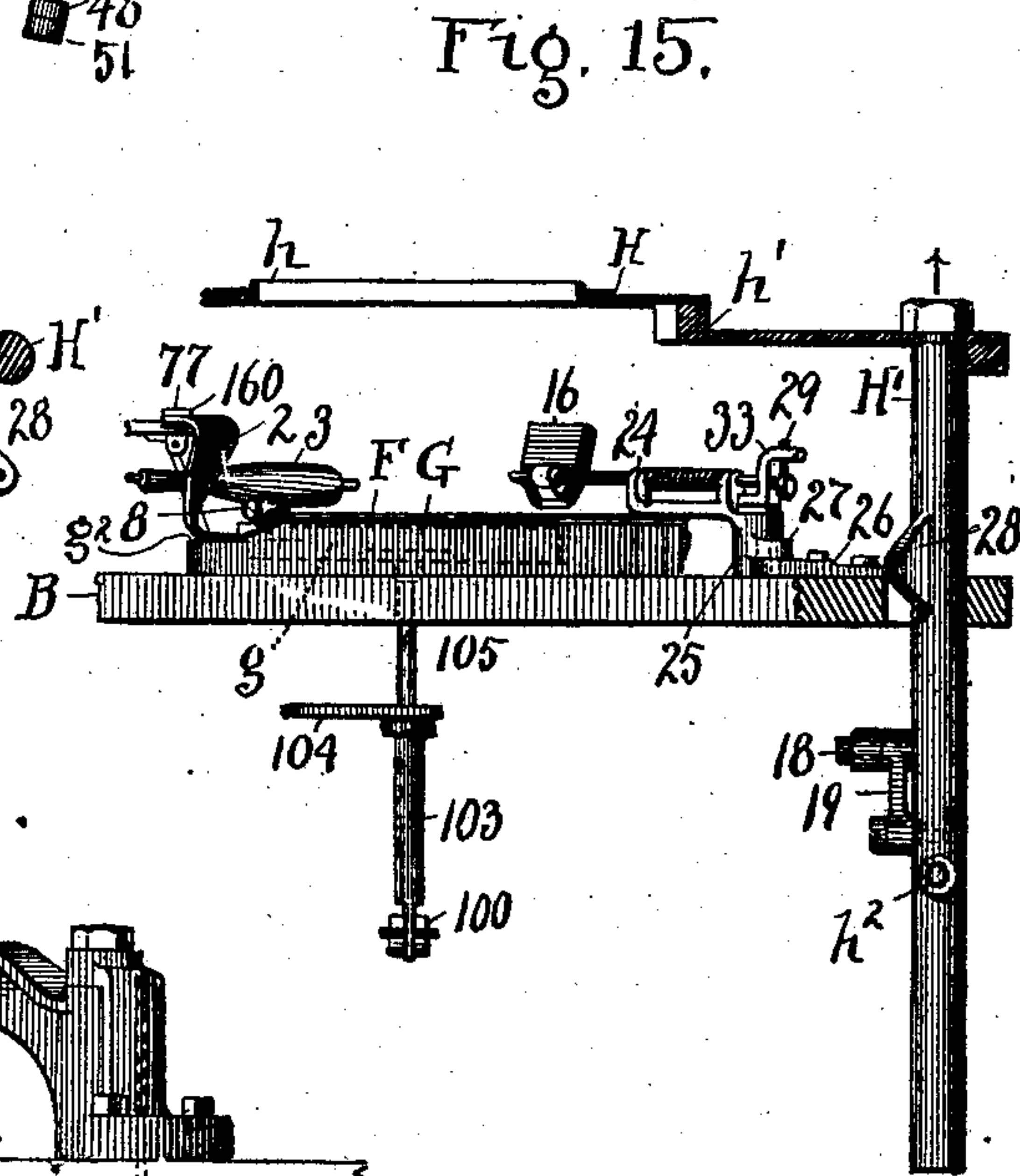


Fig. 15.

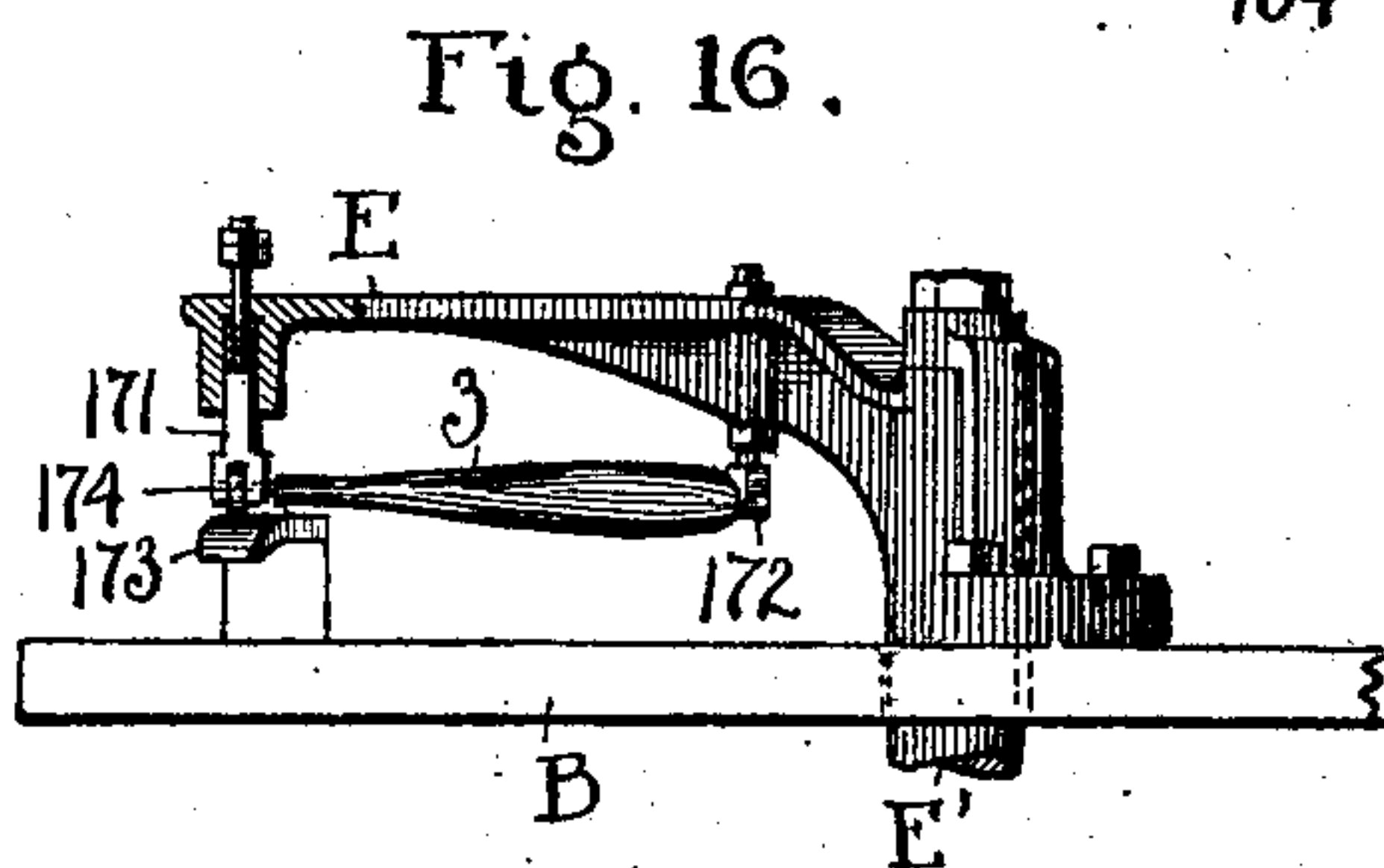


Fig. 16.

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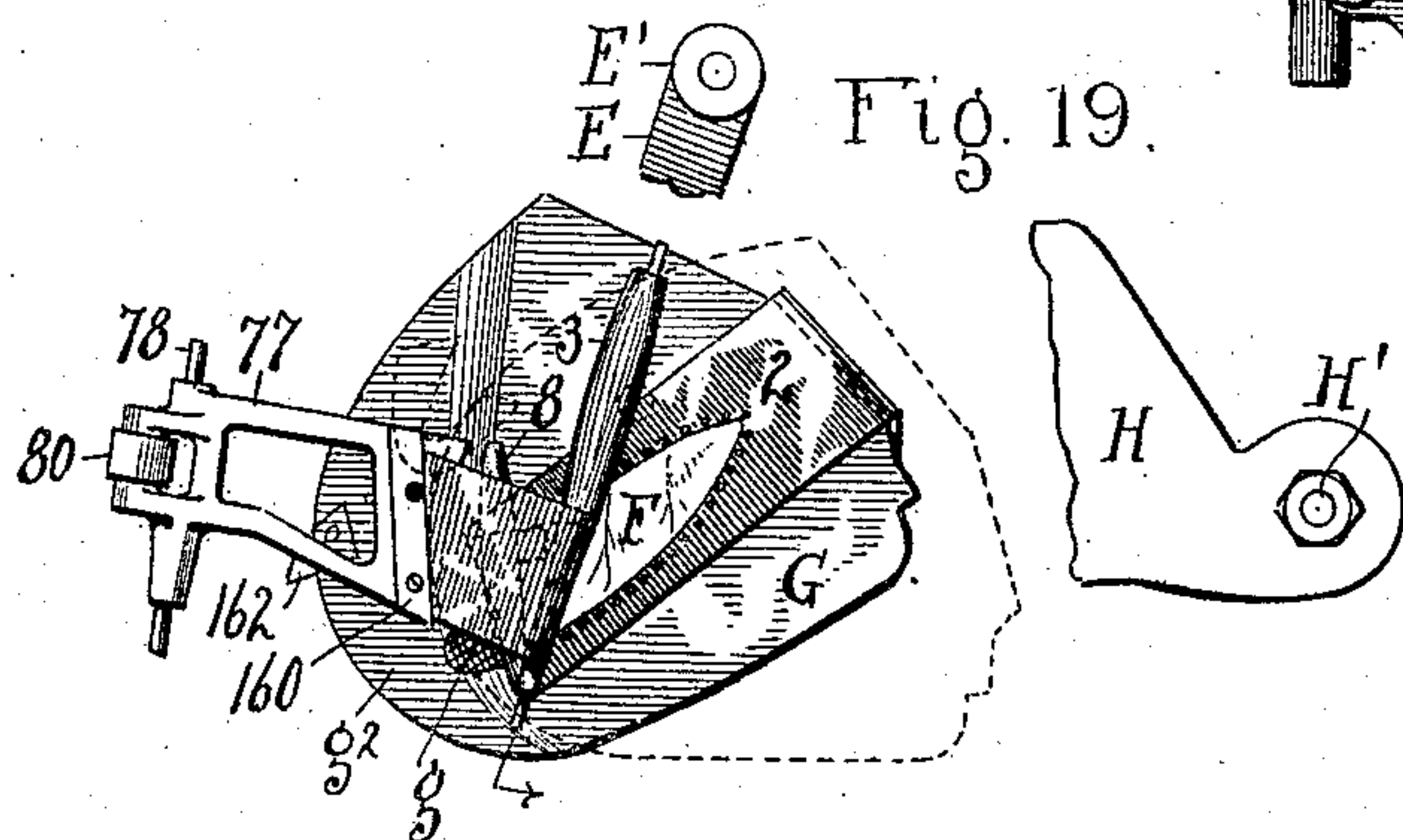
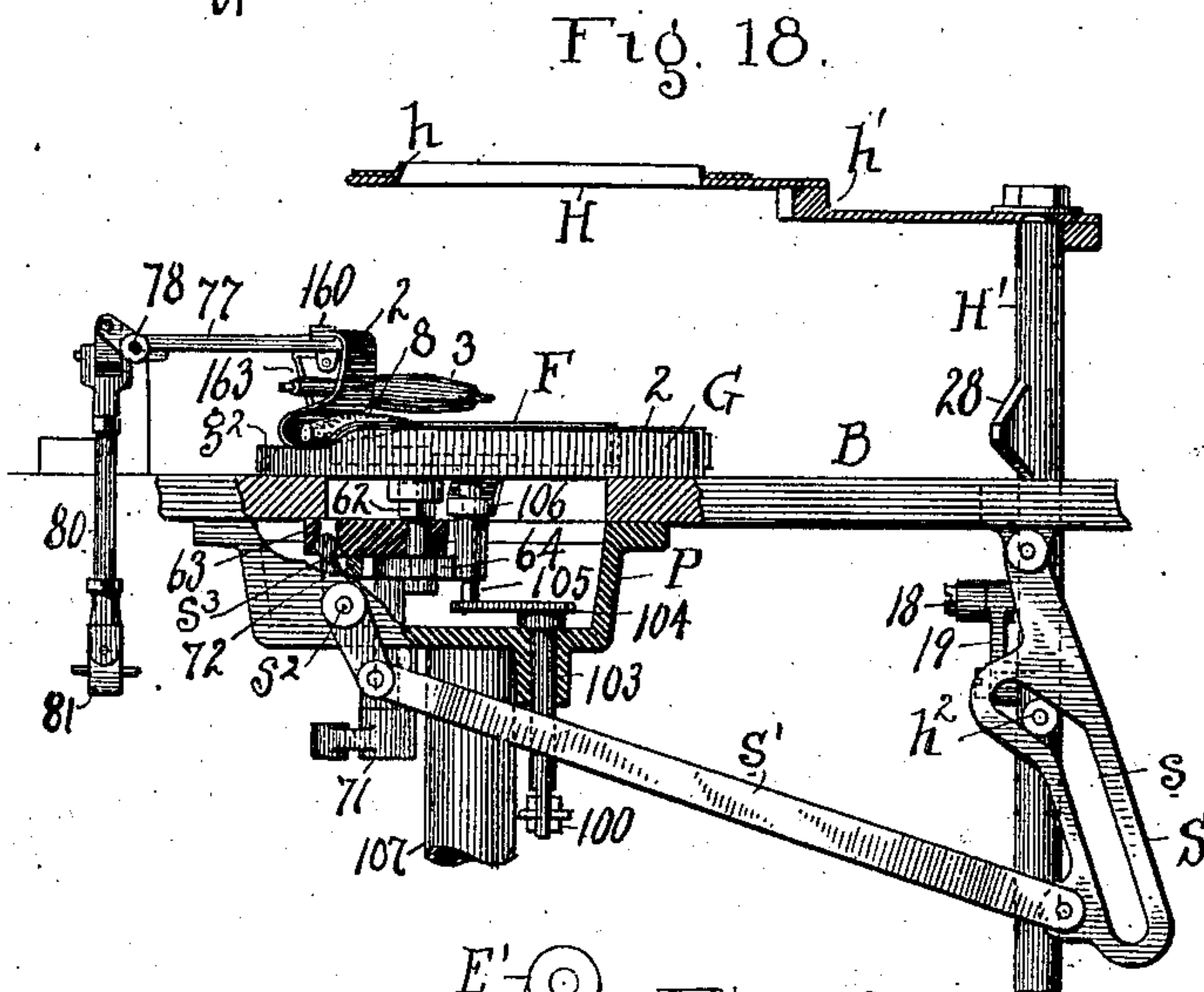
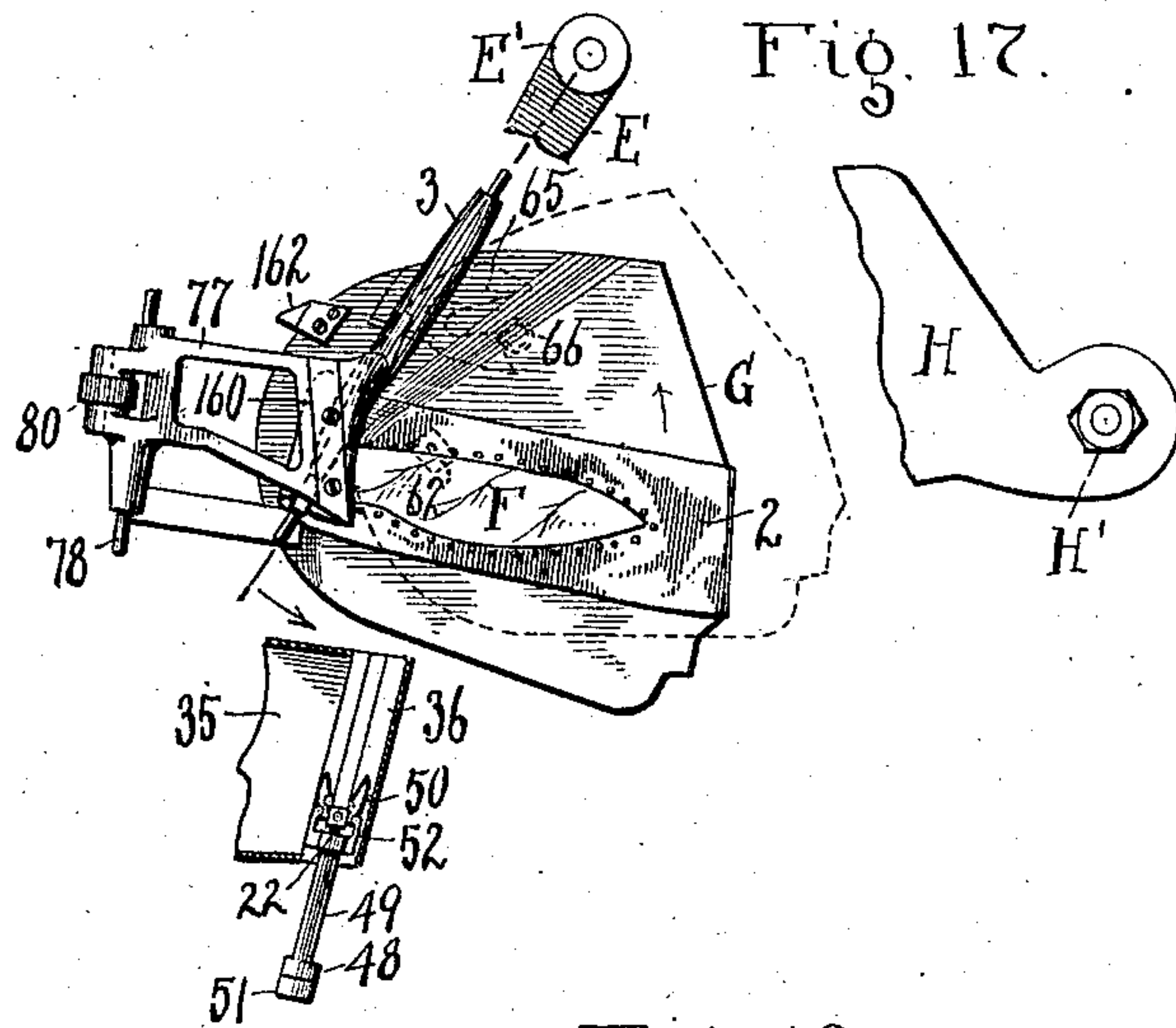
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11 SHEETS—SHEET 8.



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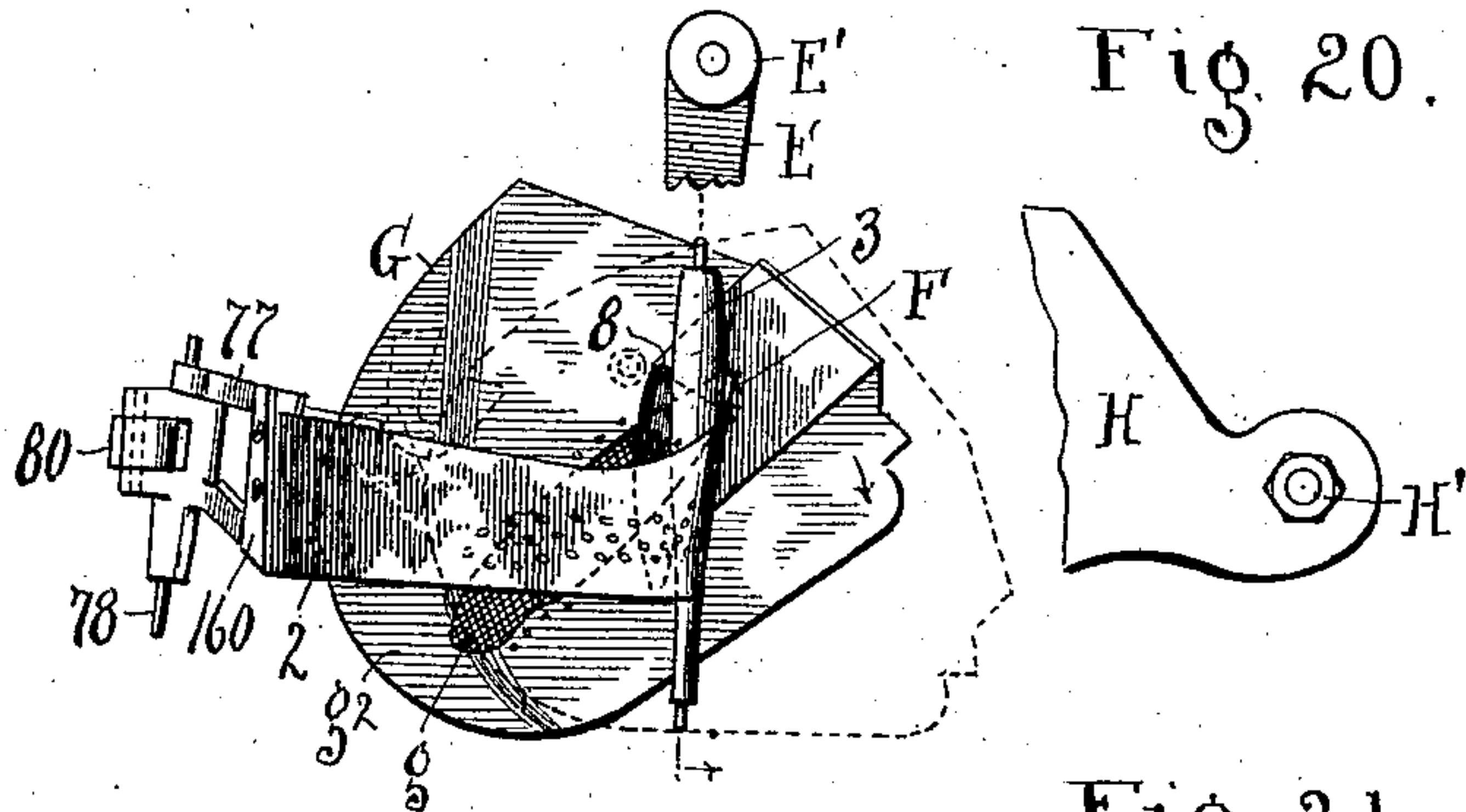


Fig. 20.

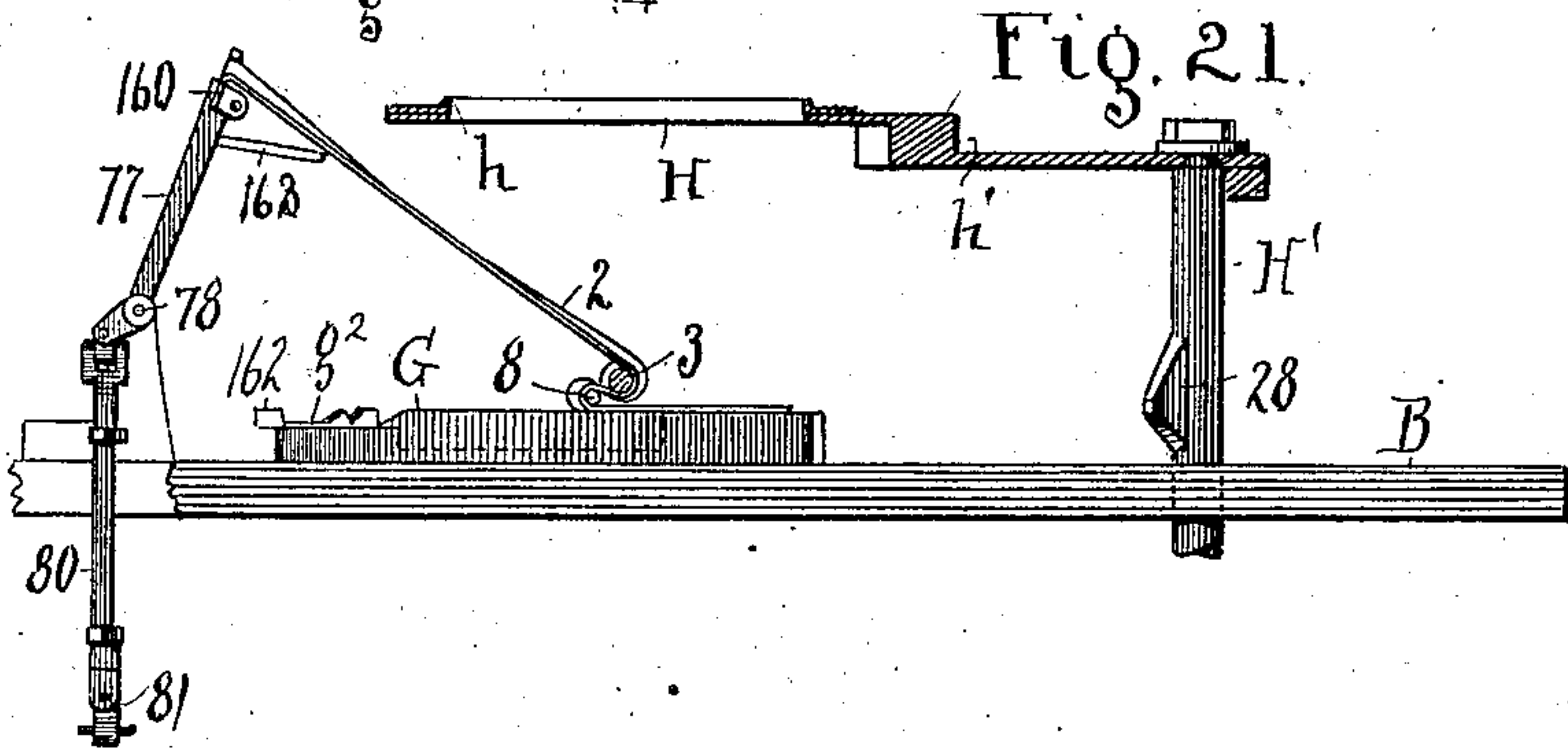


Fig. 21.

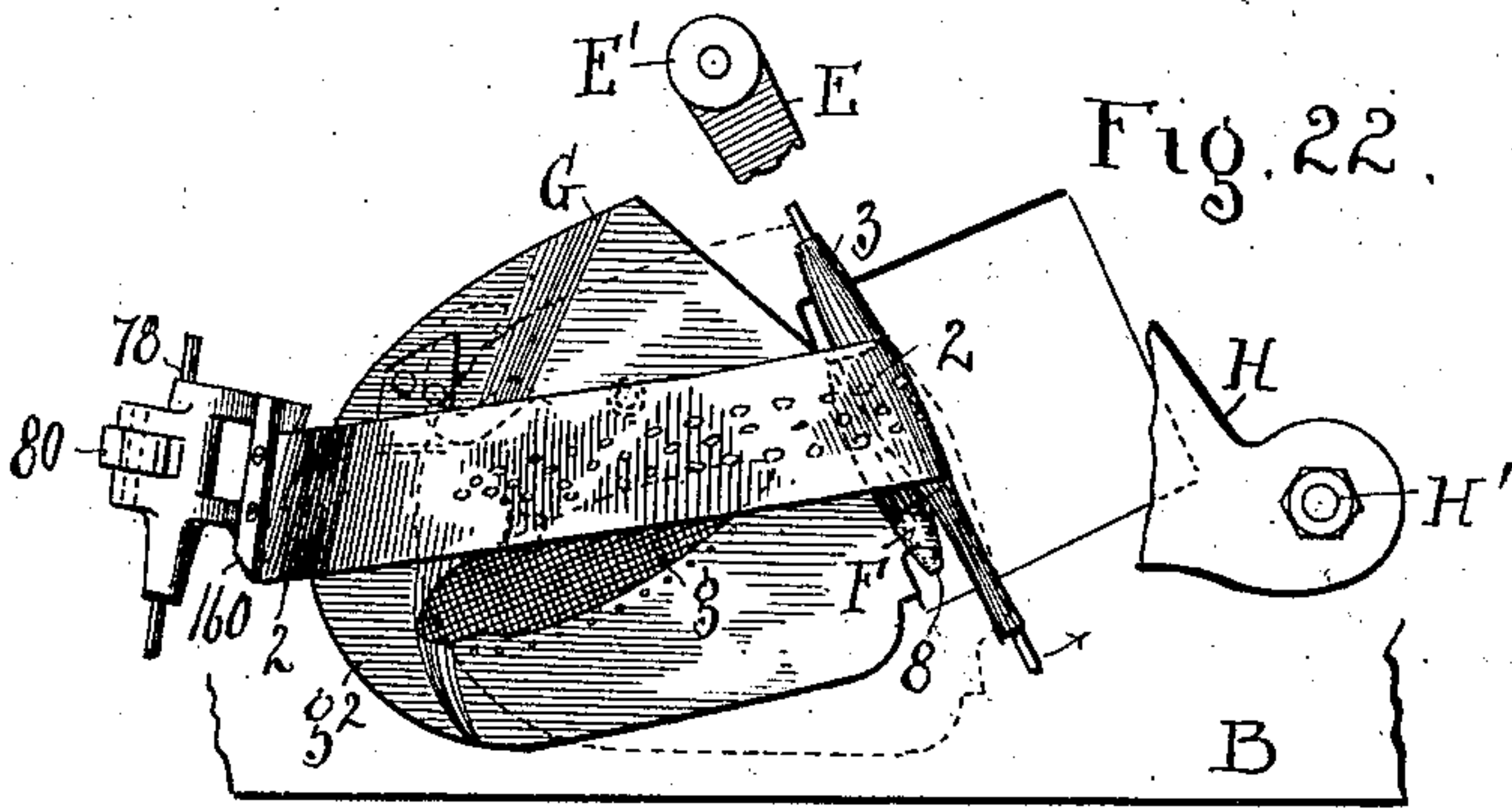


Fig. 22.

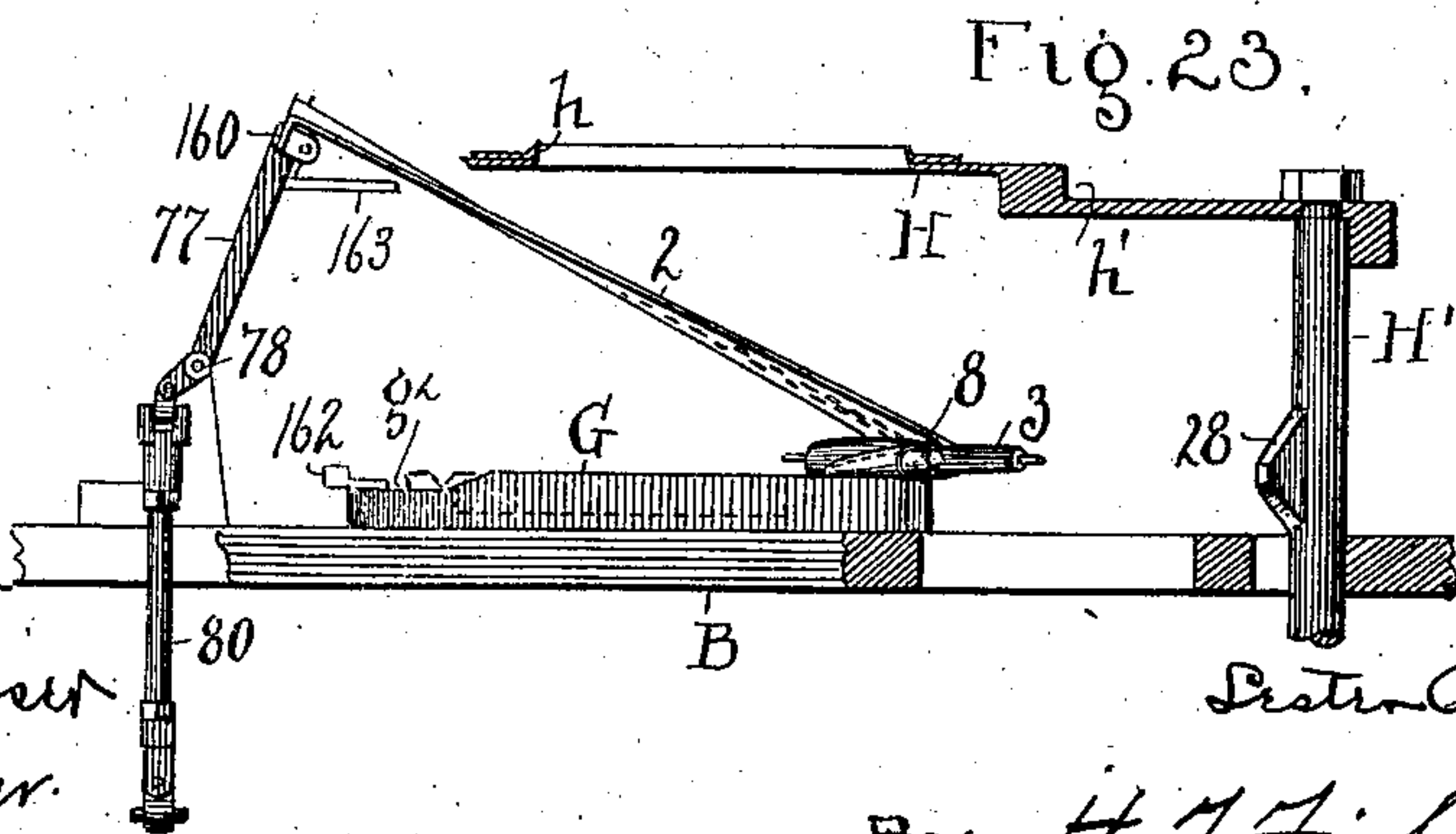


Fig. 23.

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Fig. 24.

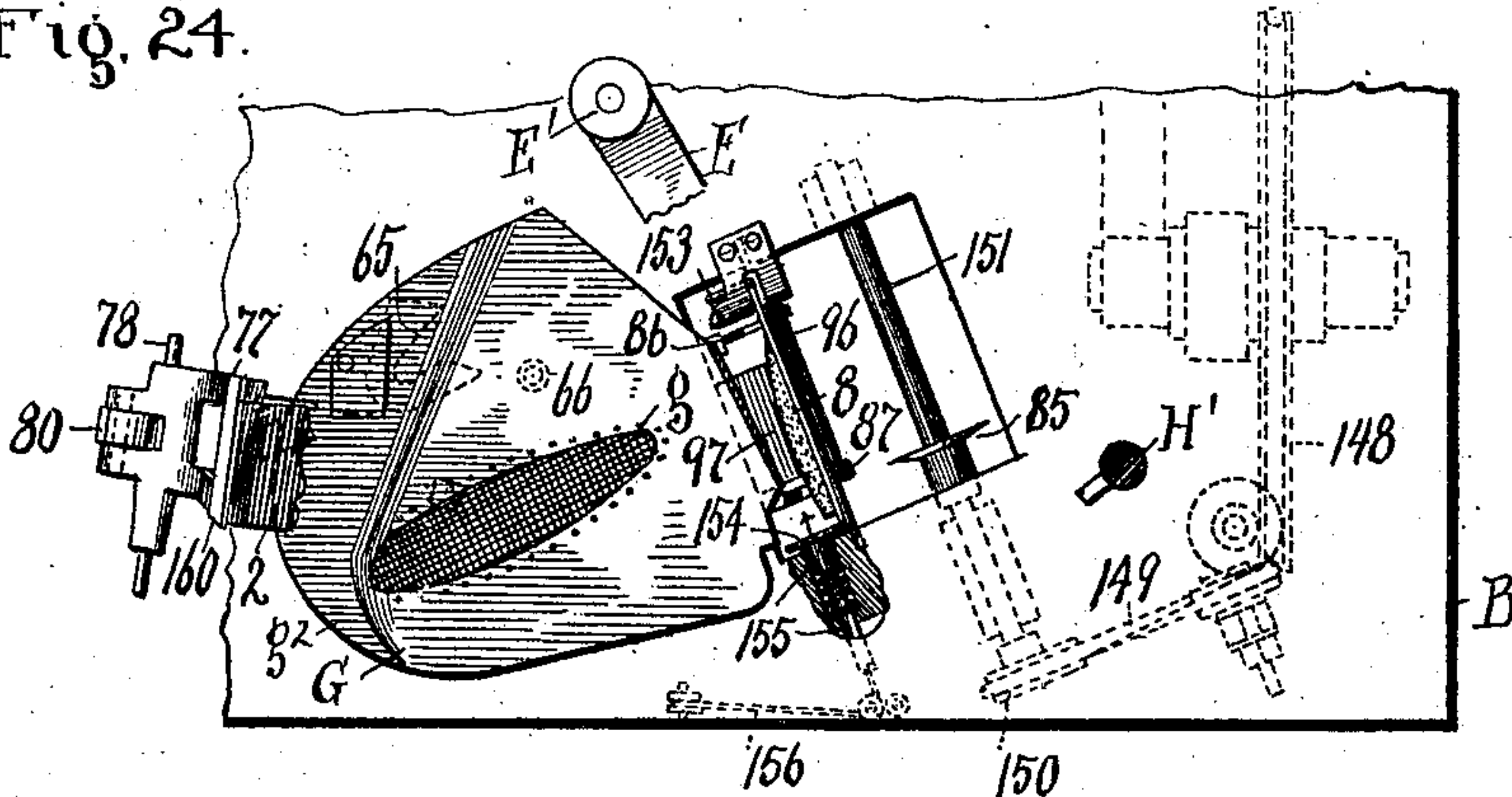


Fig. 25.

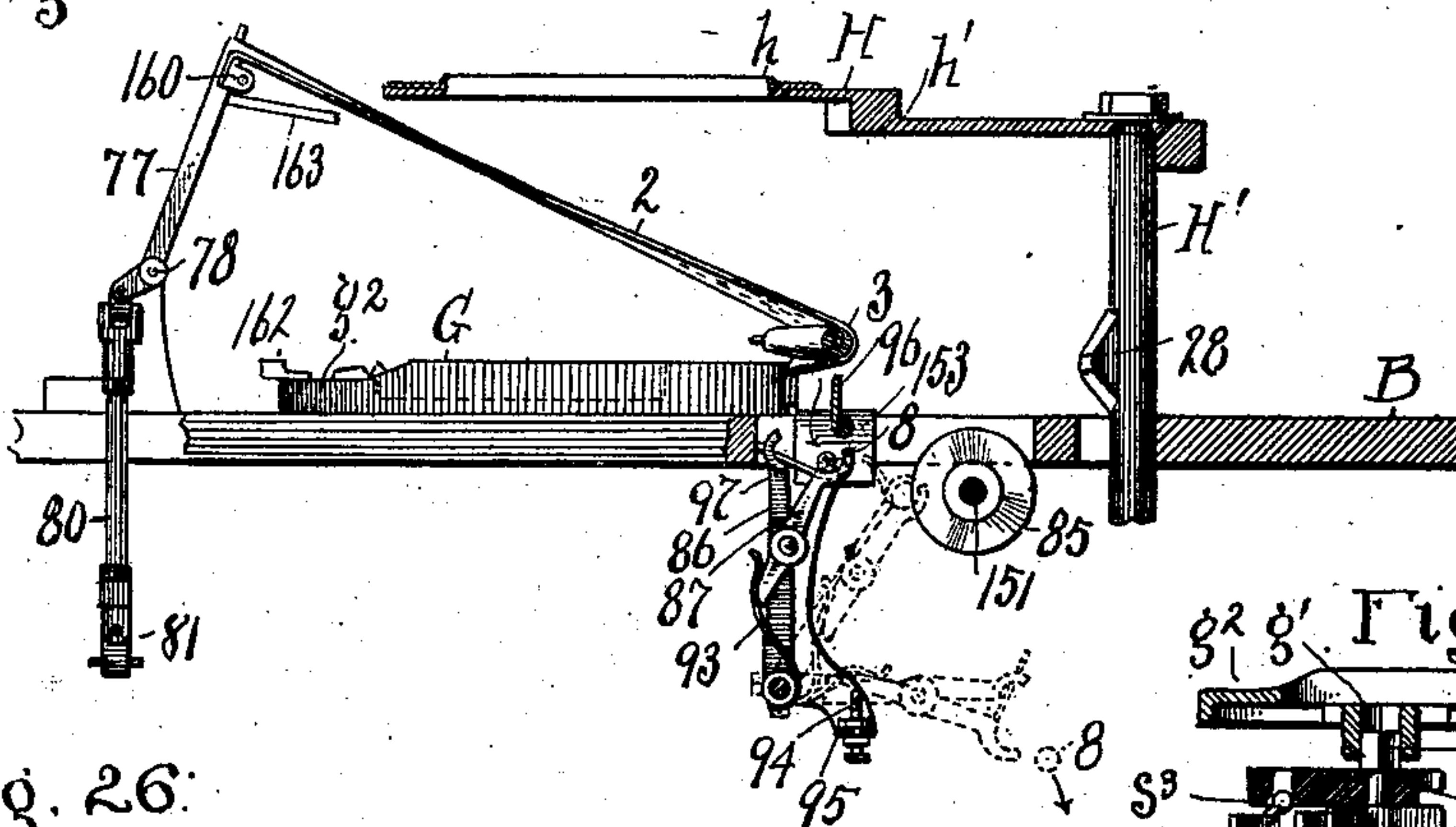


Fig. 26.

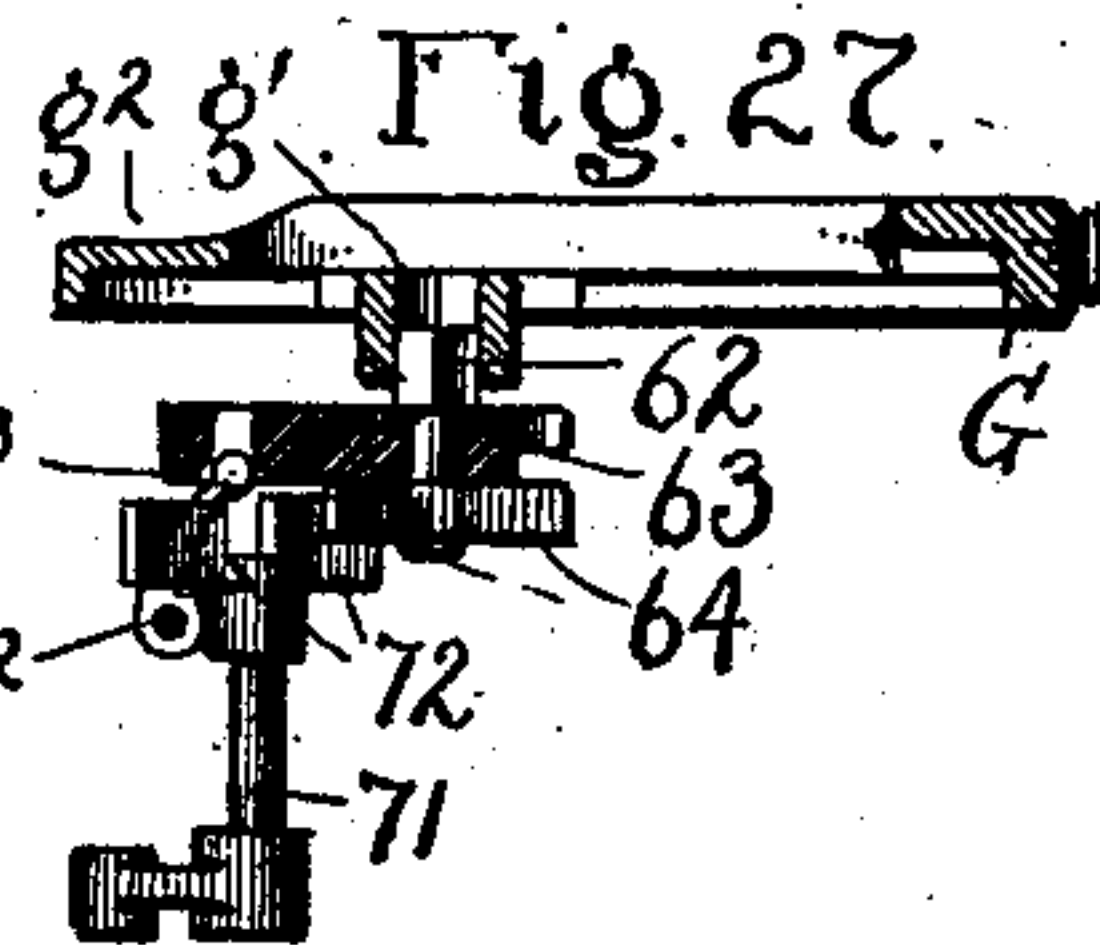
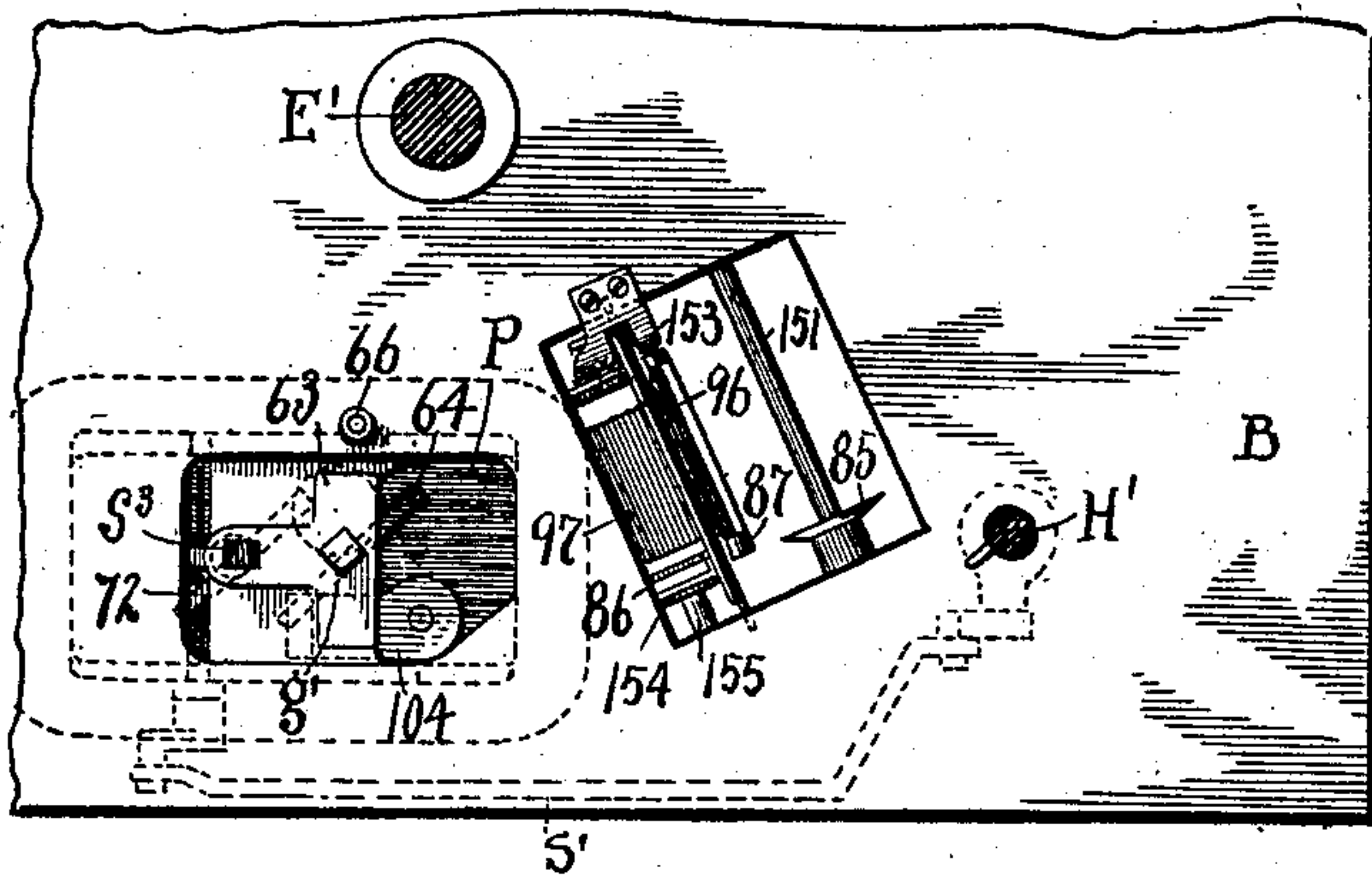
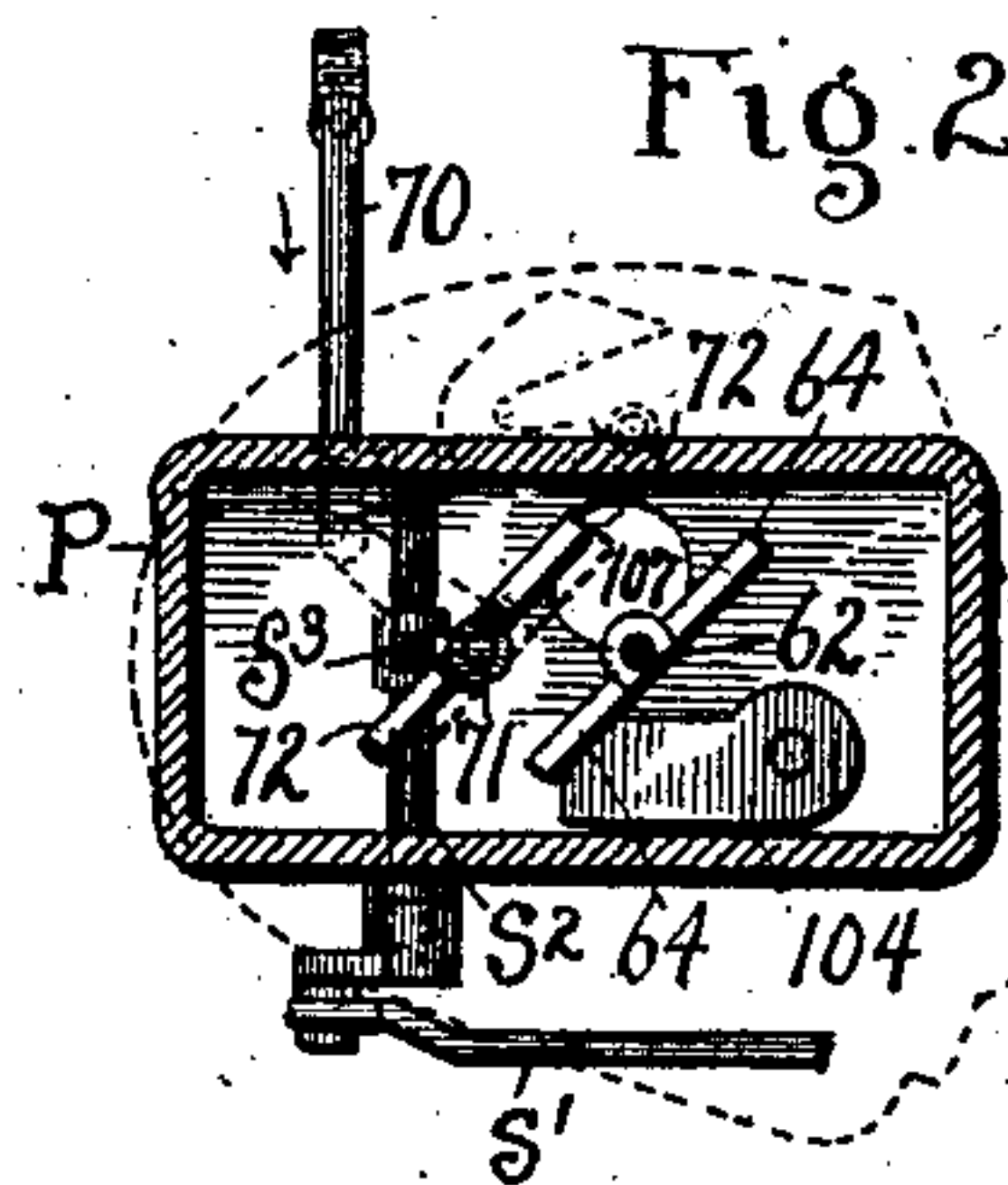


Fig. 28.



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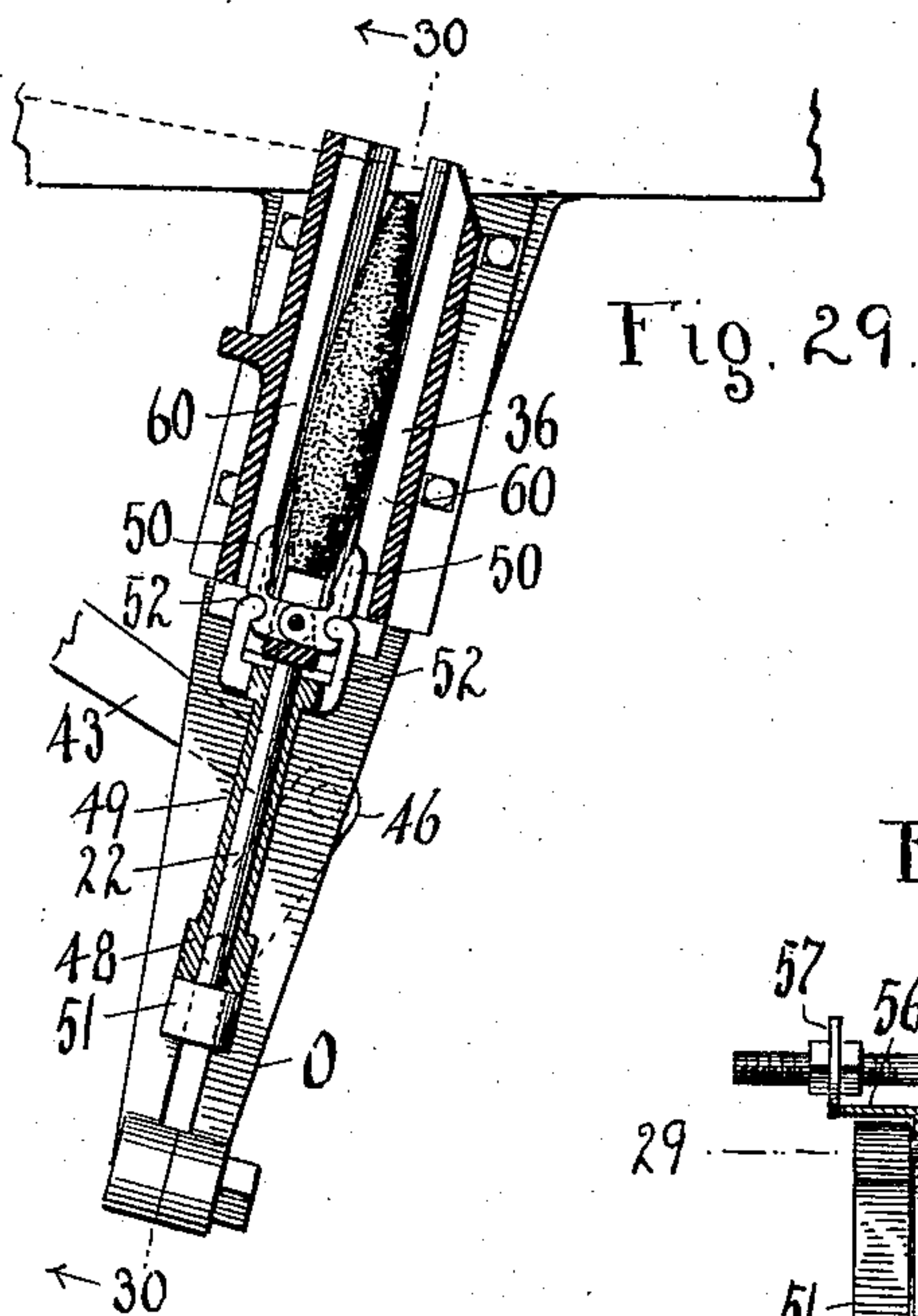


Fig. 29.

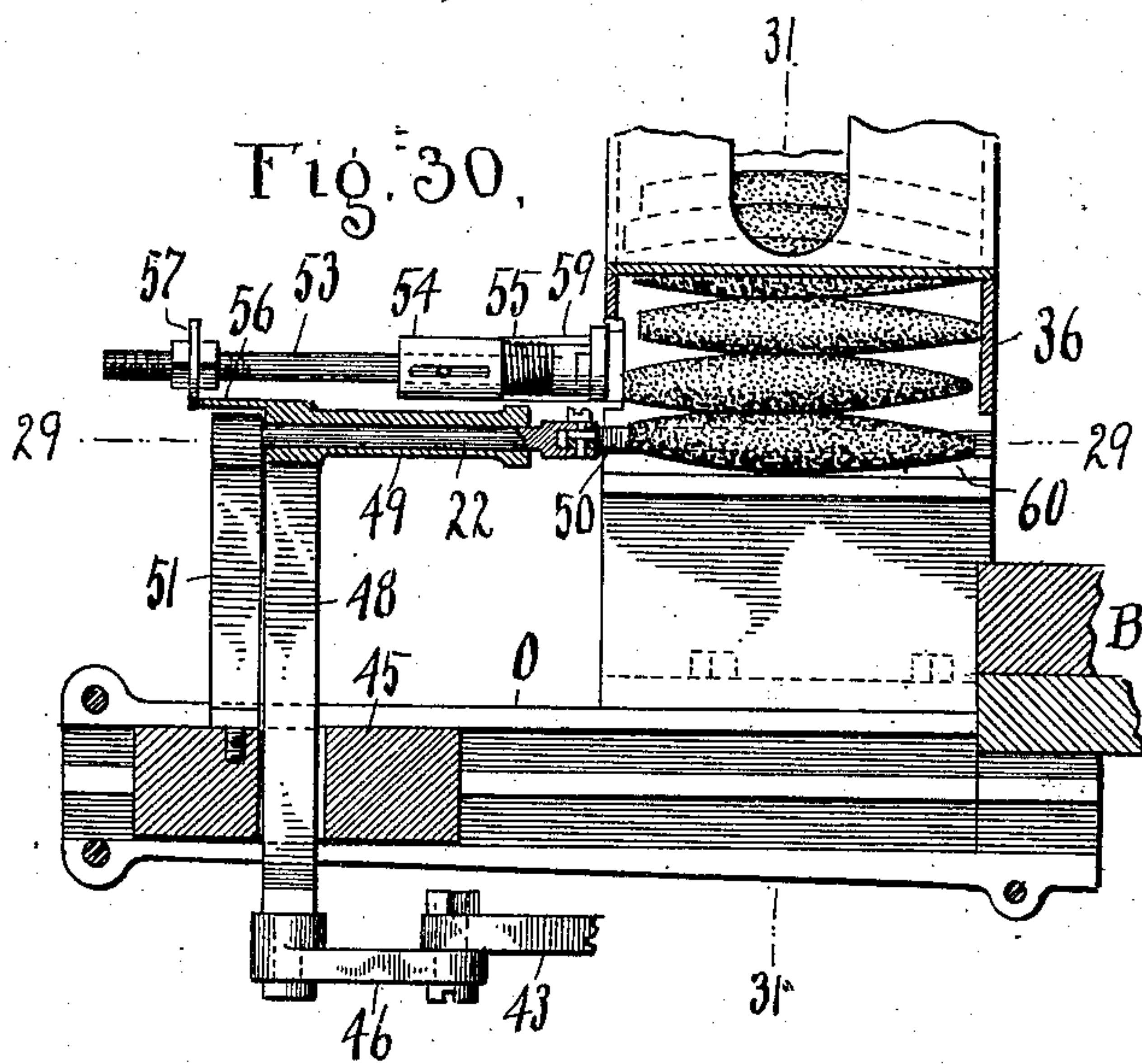


Fig. 30.

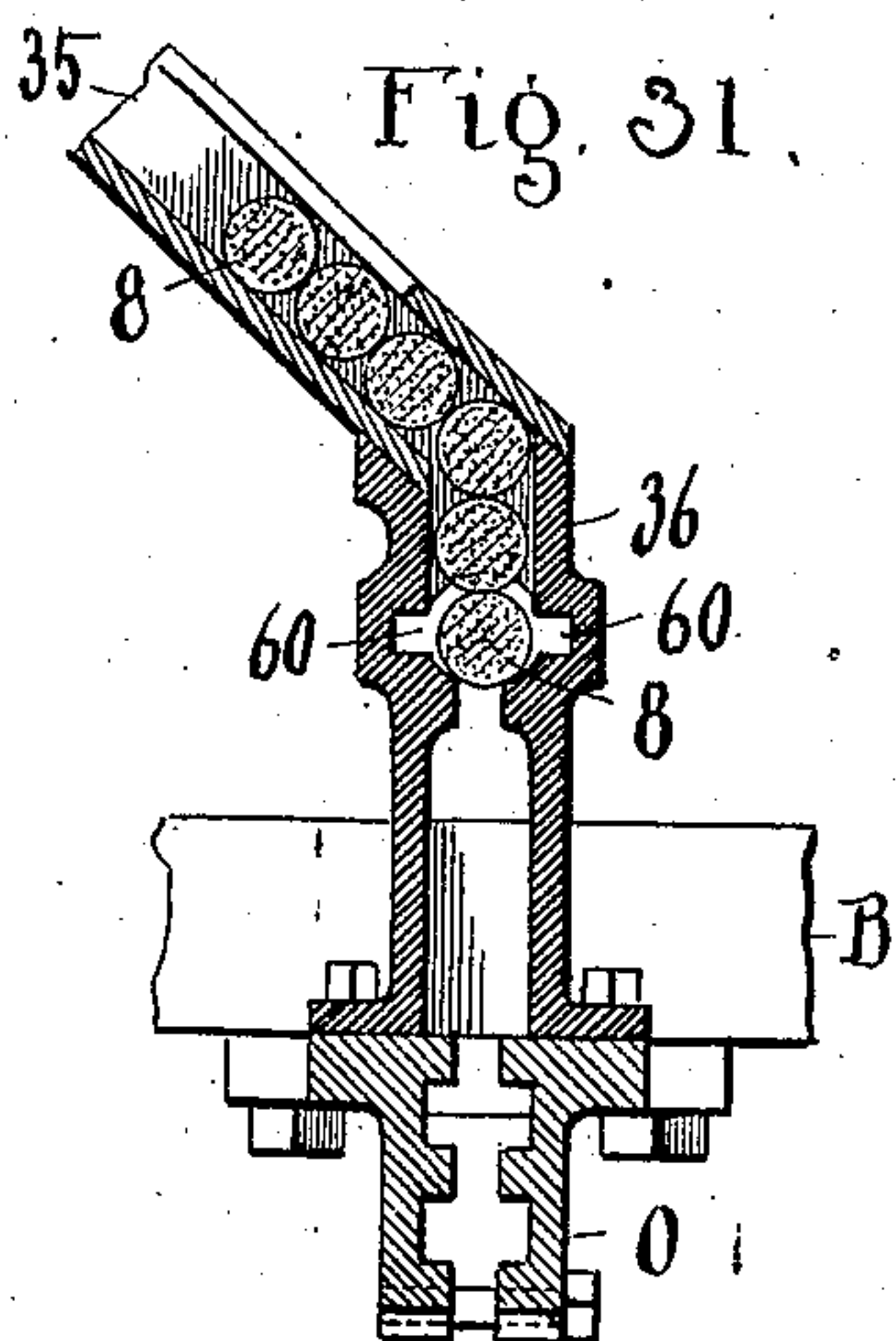


Fig. 31.

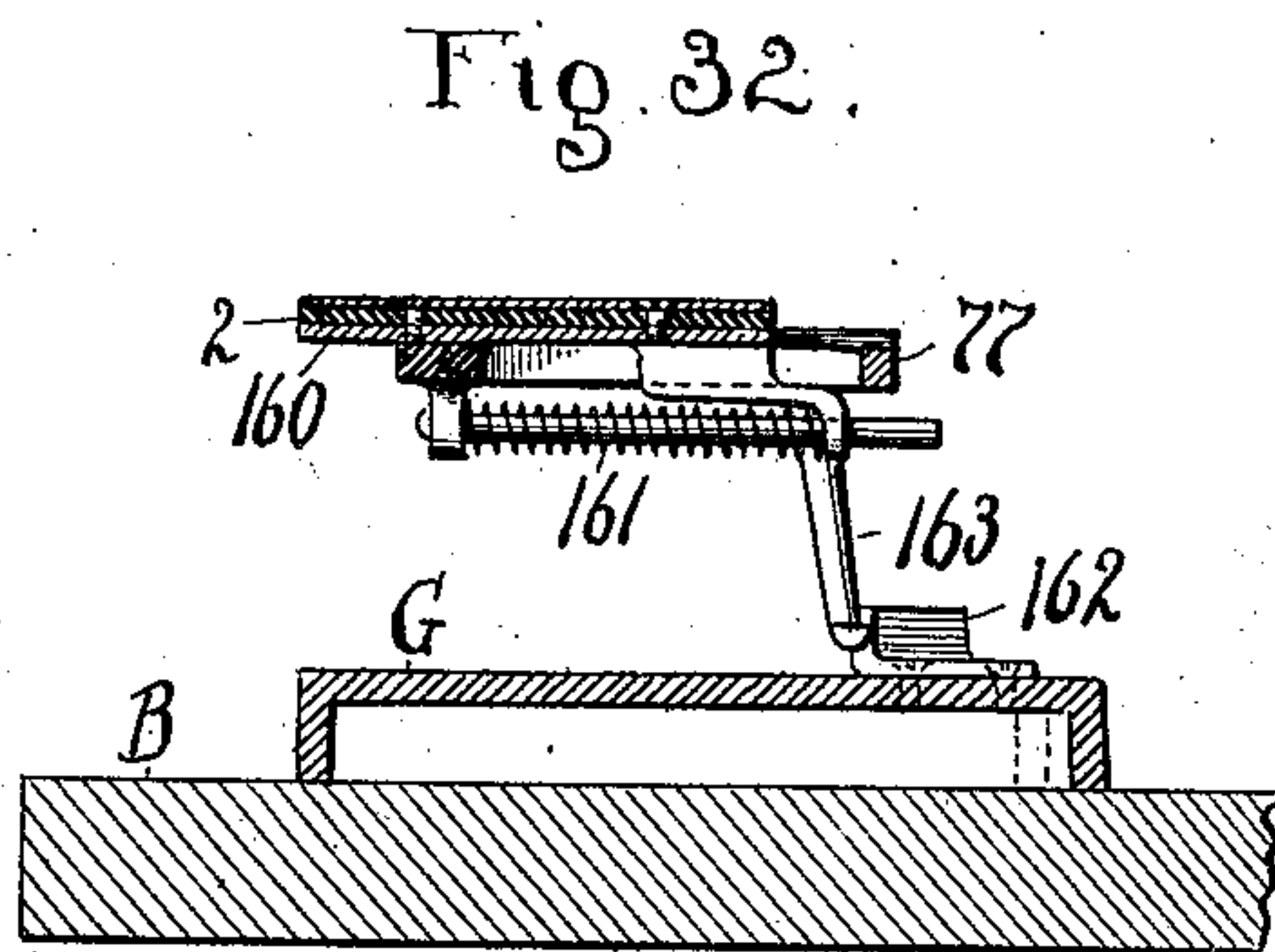


Fig. 32.

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# UNITED STATES PATENT OFFICE.

LESTER A. SCHAEFFER, OF DAYTON, OHIO, ASSIGNOR OF TWO-FIFTHS TO EDGAR A. SCHAEFFER AND B. D. ANNEWALT, OF CLEVELAND, OHIO.

## MACHINE FOR MAKING CIGARS.

No. 859,981.

Specification of Letters Patent.

Patented July 16, 1907.

Application filed September 18, 1905. Renewed December 10, 1906. Serial No. 347,157.

*To all whom it may concern:*

Be it known that I, LESTER A. SCHAEFFER, a citizen of the United States, residing at Dayton, in the county of Montgomery and State of Ohio, have invented certain new and useful Improvements in a Machine for Making Cigars; and I do declare that the following is a full, clear, and exact description of the invention, which will enable others skilled in the art to which it appertains to make and use the same.

My invention relates to a machine for making cigars, and the invention consists in a machine which automatically makes a complete cigar ready for the market from a prepared bunch and a wrapper therefor cut on the machine, and the invention is an improvement on the machine covered by pending application, Serial No. 64,738.

In the accompanying drawings Figure 1 is a front elevation of the machine, and Fig. 2 is a vertical sectional elevation of the bunch mold and slide carrier therefor, also seen in side elevation Fig. 1. Fig. 3 is a cross section of the complete parts shown in Fig. 2 on a line corresponding to 3, 3, looking down. Fig. 4 is a plan view of the working table and operating parts directly or indirectly associated therewith and in starting position. Fig. 5 is an end elevation of the machine at the right of Fig. 1, but with the band wheel removed. Fig. 6 is a horizontal sectional plan through all the several parts beneath the operating table traversed by said line, and especially disclosing the numerous cams on the power shaft and connections therewith through which power is conveyed to different distinct lines of mechanism for the successive functions of the machine. Fig. 7 is a vertical sectional elevation of the machine on line A, A, Fig. 6 at the right and showing the mechanism for raising and lowering the die plate. Fig. 8 is a sectional elevation of the machine on a line corresponding to B, B, Fig. 6, showing especially the mechanisms for discharging a finished cigar, and as appears more clearly in detail in other views. Fig. 9 is a cross sectional elevation on line C, C, Fig. 6, showing especially the mechanism for raising the die grating. Fig. 10 is an elevation on line D, D, Fig. 6, showing cam and other parts for raising die grating as well as parts for operating the rolling-board. Fig. 11 is a cross sectional elevation on line E, E, Fig. 6, showing cams and mechanism for operating the bunch feed grippers. Figs. 12 to 25 inclusive, are mostly diagrammatic views, intended to illustrate the successive steps of operation from cutting the wrapper out of the tobacco leaf on the die-plate to the making of the finished cigar, and hence only such parts appear in these views successively as are necessary to the operation immediately in-hand in each case. Thus, Fig. 12 shows the starting position of the die-plate, which is down on the rolling-board, and the to-

bacco leaf is thereon to be cut and the cutting roller in starting position. Fig. 13 shows the said roller as it has made half its circuit about the edge of the die and is ready to return over the other edge, with the protecting or bridge plate at the right down. Fig. 14 shows a cut wrapper on the apron over the rollnig-board, a bunch of tobacco held in position thereon by the grippers and the paster device in action; and Fig. 15 is an elevation of Fig. 14. Fig. 16 is a detail of the wrapping-roller and arm in starting position. Fig. 17 shows the rolling board in full lines shifted to the left and rearward as compared with the dotted lines to form a pocket in the apron, and the wrapping roller at the beginning of its movement, and Fig. 18 is an elevation of Fig. 17. Fig. 19 shows the rolling board in its extreme oscillated position rearward and the wrapping-roller moving forward and the tuck end of the bunch wrapped. Fig. 20 shows the wrapping of the middle portion of the bunch with the apron stretched and the rolling-board at the beginning of its oscillating return movement from position Fig. 19s and Fig. 21 is an elevation of Fig. 20. Fig. 22 shows the parts as when the wrapped cigar is about to be discharged from the apron and rolling-board, and Fig. 23 is an elevation of Fig. 22. Fig. 24 shows the parts as when the cigar is discharged from the apron into the discharge grippers, and Fig. 25 is an elevation of Fig. 24, the dotted lines showing the rotation of the grippers to bring a cigar against the cutter and as discharging the completed cigar. Fig. 26 is a view showing top of the table with the rolling-board removed. Fig. 27 shows a cross section of the rolling-board and the mechanism for actuating same from beneath. Fig. 28 also shows a cross section of the suction chamber and mechanism for operating the rolling-board. Fig. 29 is a longitudinal sectional view on line 29, 29, Fig. 30, of the bunch gripping mechanism open, and Fig. 30 is a vertical sectional elevation on line 30, 30, Fig. 29. Fig. 31 is a cross section vertically on line 31, 31, Fig. 30, of the bunch chute and receptacle adapted to receive the grippers shown in Fig. 29. Fig. 32 is a sectional view of the free end of the tension device showing the shifter to which the apron is attached.

Now, it will be found that the drawings thus shown follow somewhat closely the natural or unfolding order of the machine progressively as the work is done, and this enables the work to be broken up more or less into successive steps which are at least distinct enough to be viewed and described separately, though of course at last they constitute essential portions of a harmonious whole and which will appear in the detailed description. For the present, however, and to facilitate understanding of the machine, the successive steps may be regarded as arranging themselves about as follows:



1st. Attendant stretches tobacco leaf upon die-plate and pneumatic suction holds the leaf in place. Die-plate down.

2d. Cutting roller moves to the left, forcing the protecting or bridge plate down upon the free end of the tobacco leaf, and then traveling over the die—forward and back, cuts wrapper in shape for the cigar. Suction holds cut wrapper on perforated apron. Die-plate is raised.

3d. The die grating is lowered to bring apron and wrapper thereon flush with top of rolling-board. Grippers for bunch now deposit bunch at tuck end of wrapper. Paster also in action to paste end of wrapper.

4th. Rolling-board slides and oscillates to left to form pocket in apron for the bunch. Shifter for apron on tension device carries apron inward and further completes the pocket and its relation to the bunch. Bunch-grippers have retired to receive next bunch, and the bunches are automatically fed one by one from the bunch-mold at about this time.

5th. Wrapping-roller moves to right, engages apron. Drops down at its spring pressed end. Rolling-board oscillates inward in the direction of the wrapping-roller arm pivot. Tuck end of wrapper is wound on bunch. Wrapping is continuous. Tension device comes into action and stretches apron, and as the middle portion of the bunch is being wrapped the oscillating movement of the rolling-board is reversed and the tip end of the bunch then wrapped. The wrapper-bunch is then deposited into the discharge-grippers and the wrapping-roller returns to the left to starting position. Rolling-board assumes its original position when die-plate is lowered. Pneumatic suction is cut off during this return movement.

6th. The discharge-grippers are open when the wrapped bunch is deposited therein, and as the grippers close the cigar is engaged at one end by a disk to place it in proper position to have the end trimmed by a revolving knife before ultimate discharge from the grippers.

A represents the main frame of the machine and B the working table or top thereof.

C is the power shaft, carrying band or fly wheel *c* and a number of cams and other parts, and D and E are the cutting roller arm and the wrapping arm respectively.

G is the rolling-board on which the rolling and wrapping of the cigar occurs, and which is adapted to move and oscillate as will appear in the more detailed description thereof. The die-plate H is supported on standard H'. Said plate is adapted to come down and rest upon the rolling-board about the suction opening therein and about the die grating or blank screen *g* in said opening.

It will be understood that the cigar wrapper is held over said screen upon or over the perforated elastic apron 2 by pneumatic suction, as is now well known in this class of machines, and the said die-plate rests down flat upon the rolling-board when a wrapper is cut as in Fig. 12. Then as soon as the cutting mechanism has retired said plate is raised to an elevation which gives the wrapping arm E room to sweep in beneath the same and wrap and discharge the cigar and return to starting place. This brings us to the first practical step in the operation of the machine as above outlined, and in-

volves a number of parts and movements as will now be seen. Thus, die-plate H has the outline substantially as seen in plan, Fig. 4, and carries the raised die *h* for cutting the wrapper, Fig. 15. In outline the die conforms to the opening containing grate or screen *g* on which the wrapper is held when the die-plate is raised out of the way, and the said plate is purposely stepped or offset at *h'* so as to afford room for the surplus portion of the tobacco leaf and from which another wrapper may frequently be taken. This step or offset is covered by a bridge 10 pivoted to overlap said offset when the cutter roller J passes over the same and to stand erect and out of the way when said roller has done its work and returned to normal position. To this end also said bridge has a right angled wing 11 behind its pivot which is struck by roller J to turn the bridge upright, and said roller also turns said bridge down to bridging position over shoulder *h'* when it passes out to cut the wrapper. As shown the roller J has sufficient length to reach across both edges or sides of the wrapper cutting die, and it is furthermore so arranged that it cuts going on one side as it sweeps inward and on the other side as it retires, there being a tilting movement provided for in its support, but, as this is made the subject of a separate application I do not deem it necessary to go further into the details of its construction in this case. The arm D which carries said cutting roller is pivoted to swing horizontally over the rolling-board and die and back again in a sweeping movement, and is operated from power shaft C by means of a cam K, a rotatable standard 12 carrying said arm, a horizontally slidable rack 13, a roller 14 mounted on said rack and engaged in said cam, and a segment 15 on shaft 12 in mesh with rack 13. All these parts of the machine as well as those yet to be described are timed to work together automatically, and the operator has nothing to do but to place the leaf upon the die and remove the leaf scraps. Otherwise the cutting and wrapping are wholly the work of the machine, and the cigar is made complete for use.

After the wrapper has been cut and arm D is retired to starting position four things occur almost simultaneously, viz, the raising of die-plate H, the introduction of paste receptacle or paster 16 to apply paste to the exposed point or end surface of the wrapper, the placing of a bunch 8 in position on apron 2 to begin the wrapping operation, and the rearward movement of the rolling-board G to form a pocket for the bunch. Following these movements in the order thus enumerated, the die-plate is adapted to be raised and lowered and disposed in a horizontal plane in the angle between the two arms D and E the plate being shaped to avoid both. As seen in Fig. 7 its standard H' slides up and down in what is shown as a housing L, and is operated from power shaft C by cam M thereon and arm 18 connected with standard H' by a link 19 Fig. 7. Said arm is pivoted near its cam engaged end on a hanger 20 from the main frame or table B, so that a comparatively short movement of the cam engaging portion of arm 18 gives a long movement to its free end and serves to raise and lower the die-plate the required distances. When raised the said plate remains up until a cigar has been rolled and discharged from off the rolling-board, as we shall see further along, and then the same line of mech-



anism from cam M automatically lowers said plate again to receive another wrapper, and so on continuously.

When the die-plate has risen sufficiently the paster 16 and the bunch gripper 22 hasten to do their work practically at the same time, but from different actuating points. Thus, referring to Figs. 14 and 15, the paster 16 is supported on a horizontally oscillating arm 24, pivoted on a post 25 on the table B and actuated from standard H' by a slide 26 pivoted on a side lug 27 on post 25 and with its free end adapted to be operatively engaged by the substantially V shaped side projection 28 on said standard. A retracting spring 30 is engaged with slide 26 and withdraws the paster to starting position when projection 28 has passed above. The lower edge of said projection is beveled so as to press said slide to one side on the downward movement, but on the upward movement the top incline engages square against the end of said slide and forces it forward. The forward movement of the slide actuates arm 24 to carry the paste pot 16 over the tip end of the wrapper, and as this occurs the pot is tilted downwards to bring its paste depositing finger into contact with the wrapper. This result is accomplished by the contact between post 33 and a small finger 29 on the end of the paste pot supporting shaft mounted upon arm 24. A coiled spring about the paste pot shaft raises the pot upon its return movement. In this manner the paster is caused to work at the right time in the ascent of the die-plate and when the wrapper has been cut and is being held firmly on apron 2 above grate *g* by suction from beneath. This also is the time for lodging a bunch to be rolled, and the bunches are brought to the machine in a suitable bunch mold-board Y as will be seen further along, and delivered therefrom over an inclined chute or hopper 35 to bunch receiver 36, Fig. 31. The gripper seizes the lowest of the bunches at one end and carries it out endwise over and upon apron 2, and, having deposited it quickly retires. Indeed this deposit is made before the die-plate has been fully raised, and the rolling-board is moved rearward at the same time to make the pocket in the apron as will soon be seen.

The bunch gripper is operated directly from the power shaft and cam N thereon, Figs. 5, 6, 11 and 30. A direct acting initial member 37 is bifurcated to rest and slide on shaft C and carries a roller 38 at its side working in cam N. Its other end is supported in a hanger 39 and is pivotally united outside said hanger to a link 40, which engages a short arm 41 on a rocking post 42 carrying a sweep arm 43 for more immediate control of the gripper. The said rocking post 42 is supported in hanger 44, and arm 43 connects with the gripper carrying mechanism through sliding head 45 supported in the channel therefor in arm O by means of a link 46 freely engaged with said carrying mechanism, and said arm 43, respectively.

The arm O which is a portion of the fixed frame work of the machine, Figs. 5 and 30, extends outward from the edge of table B and has all the immediate bunch feeding mechanism supported thereon. The bunch receiver or holder 36, Fig. 31, is formed with two separate sides fixed on arm O and spaced apart sufficiently to accommodate the gripper mechanism between them as well as being constructed inside to lodge the bunches lengthwise one above the other in such position and re-

lation that the lower one can be taken from its rests by the gripper and laid on the apron and the gripper return to starting place before another bunch drops down into gripping position. To these ends I provide a gripper handling mechanism, Fig. 30, comprising a flat sided standard 48 projecting through the open slot or space between the sides of the arm O, and through a slot in head 45 in which it has a limited play edgewise and provided with a sleeve 49 at its top which supports the gripper spindle 22. The two gripping fingers 50 are pivoted in a head on the end of spindle 22, and said spindle or rod 22 is supported by post 51 fixed upon head 45.

The sleeve 49 has fingers 52 Fig. 29, which engage the gripping fingers near their pivot points and serve to open and close them according to their relations. Thus, when the train of gripping mechanism is set in motion from cam N the first definite movement will be imparted to sleeve 49 and its fingers 52 so as to close the gripping fingers on a bunch. The free movement endwise of standard 48 in head 45 provides for this action. Instantly then the entire gripping mechanism moves in unison to deliver the bunch, and then the same freedom of standard 48 in head 45 accords the first return movement to the sleeve 49 and causes the release of the grippers from the bunch. Thereupon all the said mechanism returns to starting position. Meantime the bunches in receptacle 36 next above the lowest one must be held up out of the way to permit the delivery to be made and the parts to return, and for this purpose I provide a device consisting of an endwise movable plunger 53, supported in a barrel 54 and carrying a spring 55 between the head thereof and said barrel, thus normally carrying the said plunger inward against the end of the bunch opposite the same and pressing the bunch against the opposite wall of the holder and supporting it in that position until released. The release comes in this instance through a lip or projection 56 on barrel 49 bearing against an adjustable collar 57 on the plunger spindle 53. Barrel 54 is supported on a stem from bunch holder 36, and the gripper fingers and controlling fingers therefor on sleeve 49 run in side grooves 60 in the bunch receptacle.

It follows from the foregoing construction that the instant the bunch grippers act to grasp the end of a bunch the bunch detaining plunger 53 will act also under the impulse of its spring 55, and it is only released after all the parts return to starting position. Then said plunger is withdrawn and the bunches in holder 36 are again free to feed down. Finally, as to the several initial operations above outlined and which terminate in the deposit of a bunch on the apron and the bringing of all the parts into position to roll the same, it is necessary that the rolling-board be both moved bodily rearward and also oscillated to the front to get it into the desired positions for this work.

Referring to Fig. 27 it will be seen that the said board G has an angular opening *g'* in its bottom adapted to receive the head of a short spindle 62 rotatably mounted in plate 63 slidable back and forth in guide ways in the side of pneumatic suction box or chamber P, Figs. 9, 26 and 28. At its bottom the said spindle has opposite fingers or projections 64 through which rotation of the spindle and rolling board is effected independently of its movement through sliding plate 63 in which it is



rotatably mounted. Then as a still further provision for the movements of the rolling-board it is provided on its bottom and side with an open slot or channel 65 adapted to engage a fixed roller 66 on table B at the side of the opening into chamber P beneath. The various oscillations and movements of the rolling-board in conjunction with the wrapping-roller are effected through these mechanisms, each of which is caused to act to produce or to assist in producing a certain predetermined movement at a given time according as one stage or another of the wrapping has been reached, and all the movements are designed to be such, first and last, as to be at least equivalent to hand work in accomplishing the same results if indeed they be not practically the same in manner and kind though done by what may be termed sleight of mechanism rather than by the sleight of hand.

Two lines of mechanism enter into these operations, one to move the carrier 63 back and forth and the other to rotate short spindle 62. The slide movement proceeds initially from die-plate standard H', and the rotary movement from cam R on the power shaft. Standard H', Fig. 18, has a roller  $h^2$  which runs in a slot  $s$  in a hanger S pivoted beneath table B at its upper end and has a link  $s'$  connected with its lower end. This link controls a small rock shaft  $s^2$  which rests in the walls of chamber P and has a finger  $s^3$  engaged in the rear of plate 63 adapted to carry said plate back and forth in its guide the requisite distances at the requisite times as provided for. The said rotary movement of spindle 62 is effected by means of rock sleeve 67, mounted on shaft 68, Figs. 6 and 10, and having at one end an arm with a roller 69 riding on cam R and at the other end an arm which connects by link 70 with an arm on vertical rock shaft 71 projecting into pneumatic chamber P through the bottom thereof and carrying opposite wings 72 at its top adapted to engage the opposite fingers 64 on spindle 62. This gives to the sliding plate 63 a perfectly free movement back and forth with positive actuation from hangers S through the slot therein, and independent rotation by means of wings 72 engaging fingers 64 at one side or the other according as the rolling-board is to be turned by pivot spindle 62. Obviously the back and forth as well as the horizontally rotated movements of the rolling-board will be modified into more or less oscillation thereof and in both degree and time of oscillation by the side roller 66 engaged in the open slot on the bottom of said board, Fig. 9, and all these movements are illustrated in the several diagrammatic views, Figs. 12 to 29, in connection with which the said movements will be more particularly described.

Now, as a resume of the mechanisms and operations just set forth, it has been seen how die-plate H has been raised, a wrapper F pasted, a bunch delivered on the wrapping apron at the end of the bunch wrapper and the rolling-board run back to the beginning of the rolling operation, and where the apron and the wrapper roller take up the work. This relation of parts is substantially as shown in Figs. 14 and 15, wherein paste is being applied to the cut wrapper F, a bunch 8 is being deposited by the gripper over the inner end of the wrapper and over the apron, and as the die-plate H rises higher the rolling-board G will be carried rear-

ward while the grippers 22 retire and the wrapper roller 3 comes into action, Fig. 16. From this time on the important and difficult function of wrapping the cigar will be worked out mainly by the rolling-board, the apron and the wrapping roller, and the manner in which this is accomplished can best be followed in Figs. 17 to 25 inclusive. However, preliminary to this consideration, it is to be noticed that wrapper roller 3 has the peculiar shape shown and is supported at its ends in bearings depending from arm E and adapted to be adjusted in said arm to give the roller the requisite elevation at its ends. Said arm is rigid with a rotatable post E', Fig. 9, supported in end bearings and having a segment 74 on its lower end engaged by a rack 75, Fig. 6, having a roller 76 on its back running in cam wheel T on the main shaft. Thus a rocking movement is imparted to post E' which causes the arm E to move horizontally over the rolling-board at the requisite time and speed to cause roller 3 to do its work, after which said arm is retired to starting position and awaits the next operation.

The wrapping apron 2 is not only flexible but elastic, and is secured at one end to the front of the rolling-board and at the other to a carrier frame 77 supported on a horizontal axis 78 and which is adapted to swing on said axis from horizontal position, say as in Fig. 15, to the extreme of movement Fig. 25, where the finished cigar is being discharged. Said mechanism therefore serves not only to take up the slack in apron 2 as rolling proceeds but also to produce a certain and quite considerable tension in said apron, thus assuring tightness in the wrapping. The fact that said apron is elastic is very material, because by this the tension can be distributed and made effective over all parts of the cigar, including its tapered portions as well as its body. The throw of said frame 77 is effected through a rod 80, linked to the rocking axis 78 and engaged at its lower end with a yoke 81 on an arm on rock shaft 82, Figs. 6 and 11. The other end of said shaft has a long arm 83 carrying a weight 84 and having a roller V' on its opposite end adapted to ride on cam V on the power shaft. The cam V is so constructed that when the rolling of the cigar begins the roller V' on arm 83 rides down the cam and the weight 84 is then free to do its work and cause the requisite tension on apron 2. Said weight is adjustable to increase or decrease the tension. Of course the apron only yields to the pull of the said counter weight as the rolling progresses, and not until the cigar is discharged can it assume the extreme position Fig. 25. Its slack position is seen in Fig. 15, and some of its progressive positions in Figs. 21 and 23.

Returning now to the thought that the parts are ready to proceed with the rolling, the pocketing of the bunch is the first succeeding step, Fig. 18. In this instance the rolling-board has been carried back beneath roller 3 and a pocket formed in the apron behind said roller for the bunch, and the bunch has been deposited therein with one end over the corresponding end of wrapper F. In Fig. 19 the rolling-board is shown in full lines at the extreme of its rearward oscillated position, and in which the tucking of the wrapper on the end of the bunch has been effected and the bunch and roller sustain the relation shown in Fig. 19, the apron 2 being drawn taut by the counterweight mechanism



above described for controlling the same. The pocket for the bunch continues behind roller 3 to the end of the wrapping.

The tucking of the wrapper on the bunch having been accomplished, the roller 3 continues to travel over the rolling-board by the sweep of arm E on its pivot and carries the apron pocket with it, but while this occurs and when said roller has reached the position about as seen in Fig. 20, the rolling-board takes a shift forward and outward at its front particularly from full lines in said figure to approximately the position full lines Fig. 22, thus causing a special wrapping tension to be exerted on the apron at its rear edge over the point or tip end of the cigar and during which time the wrapping-roller continues on its journey. The next instant, the parts reach position Fig. 22, when the wrapping has been practically completed and the cigar is ready to be discharged, Fig. 25. Then follows the trimming of the cigar and the product of the machine is finished.

The trimming mechanism Fig. 24, comprises a rotating cutting disk 85 and a pair of discharge grippers 86 and 87 constituting together one gripper and adapted to grasp the cigar bodily between its ends and hold it against a trimming disk 85, Fig. 25, to sever its tucked end. The said grippers are adapted to receive the cigar, as seen in full lines, Fig. 25, and next to hold the cigar to the cutter, as shown in first dotted lines, and finally to open and discharge the cigar, second position dotted lines. The cutter-disk rotates constantly, but the grippers operate only after a cigar has been received therein. Then they wait until the cutter has cut out another wrapper and the paster moves to work, and then they rotate down past cutter disk 85 and drop the cigar at the end of their movement.

The main gripper frame 86 Fig. 25, is supported on a rock shaft 88 in hangers from table B, and on the outer end of which shaft is an arm 89, Fig. 6. An actuating arm 90, Fig. 8, supported by hanger 20 has a roller 91 on its crank arm extremity working in a cam groove in cam wheel W. Suitable links connect arms 89 and 90, and the effect of this mechanism is to carry the gripper frame 86 and its associated part 87 down and back as seen in full and dotted lines Fig. 25.

The part 87 is held closed by spring 93 pressing thereon below its pivot, but is open in receiving position, Fig. 25, and opened again at discharge, the latter effect being obtained by set screw 94 striking the portion behind or below its pivot. Said screw or screws are supported on a cross piece 95 on the hangers from the table carrying rock shaft 88. A pivoted guard plate 96 guides the cigar down to the grippers, and part 87 is provided with a drop plate 97 which receives the cigar and which, when the jaws are in receiving position, serve as a stop for part 87, holding it open.

Thus we have shown progressively a sustained operation of the machine from the beginning with separate bunch and wrapper, to perfect union thereof in a commercial cigar automatically made, and in so far as the mechanism for doing these things is concerned there remains nothing important to add. However, there are yet other mechanism and functions which are essential to the continuous automatic operations of the machine which are no less important in their place than those already described, as, for example, the

means for feeding the bunches to the grippers, and the raising and lowering of the grating or webbing in the rolling-board, besides a number of details not mentioned in the general description.

The movement of the grating is important in the cutting of the wrapper and in its subsequent rolling, the said grating coming flush with the cutting edge of the die in the first instance and then dropping to be flush with the rolling-board when rolling occurs. The raising of said grating occurs through mechanism, Figs. 6 and 10, comprising an arm 100 on rock shaft 68, from which an arm 101 on the extreme end of said shaft goes to cam wheel X on power shaft C and by which mechanism just enough movement is afforded to raise said grating as required. Its own gravity lowers it. The arm 100 engages the lower end of a lift-spindle 103 guided through the bottom of chamber P and having a head 104 on which the stem 105 of grating box 99 has room to slide back and forth, said stem being supported in sleeve guide 106 fixed to the bottom of the rolling-board and in which it is adapted to slide up and down but is otherwise held in line with the opening for the grate-head in the rolling-board.

The mechanism for temporarily closing the valve which controls the atmospheric suction in chamber P is in this neighborhood, and serves to cut off the suction temporarily while the parts are resuming their starting position after a cigar has been made and when the apron should be free to take its proper working relations without possible hindrance from any source. This mechanism therefore comprises a suitable shut off valve P' in depending suction tube 107 from chamber P, and which is merely a flat plate held normally at one side of said tube in housing 108 but adapted to be drawn across said tube by engagement with pin 109 in its stem and which is located in operating relation to horizontally rotatable wing or blade 110 on rock shaft E'. Wing 110 has a down turned lip at one edge so that as said wing sweeps across the path of pin 109 it will pass beneath and raise the pin but not operate the valve. But on its return stroke the edge of the wing will strike the pin and momentarily close the valve and when released spring 112 will again open the valve. Pin 109 is free to slide up and down in the stem of valve P'.

Referring now to the means for supplying the bunches successively and automatically to the machine to keep sustained operations, it is to be noted that the immediate feed mechanism, comprising the bunch grippers and the receptacle containing the same, as well as the means for holding back the pile of bunches in the receptacle and again releasing them, has been fully described in connection with Figs. 29, 30 and 31. The supply mechanism in advance of that just referred to, whereby the bunches feed forward to the bunch hopper or chute 35 automatically consists in a bunch mold or section of mold Y. This part is preferably made of wood and in fact is one half of the mold proper, the other half not coming to the machine but together they constitute the parts by which the bunch is made. In practice I find it desirable to allow the bunches to remain in the molds for at least twenty-four hours after being placed therein. Then the mold shown is ready to bring to the machine and give up its contents. Each mold or board has capacity for say twenty bunches,



and one board after another is placed in the machine by an attendant and removed as exhausted, the hopper 35 and bunch receptacle being designed to carry enough bunches in supply to bridge over the changes of boards.

Each bunch has its own pocket in the board, and plugs 114 Figs. 2 and 3 for partially ejecting the bunches project into said pockets or troughs near one end and are fixed to a rod 115, which with the plugs is adapted to be pressed inward its full length just far enough to partially eject all the bunches, dotted lines, Fig. 3. But the bunches are confined at their other ends by a rod 116 adapted to swing in front of the ends of the bunches on its supporting links 117 on the mold carrier and confine the bunches in the troughs at that end.

In its starting position the board is down at its lowest point and it unloads from the top downward while its feed is upward. In Fig. 1 it has discharged at least three of its upper bunches. Behind the rod 115 there is a plate 118 supported edgewise on rock links 119 on the carrier 120 and controlled by a short rock shaft and counterweight arm 121, Fig. 3, by which the plugs 114 are engaged and pushed inward to partially release the bunches, see dotted lines Fig. 3.

Board or mold Y is supported on pins 122 on the face of the carrier 120, and said carrier runs in channels or guides in the side edges of the fixed carrier frame 124. The said frame stands at the side of the machine with its face at right angles to the front of the machine and rises at such elevation as to enable the mold board to be lifted bodily above the hopper or chute 35 for receiving the bunches and from which raised position the board is removed and replaced by another.

The upward feed of the board is effected from power shaft C and cam Z thereon through shaft 130 and arm 131, which carries a pawl or dog 132 engaging a line of teeth 133 on the back of the carrier. It follows when cam Z makes a single complete rotation the carrier will be fed up one step and another bunch will be brought to position for ejection and so on. An extra gravity pawl 134 supports the carrier when operating pawl 132 drops to make a fresh engagement, and both pawls may be thrown temporarily out by means of bar 135 pressing inward against the outer exposed ends thereof and which is pivoted on the two rockers 136 and 137, the upper of which has a handle to control the said bar. This mechanism is used to disengage the pawls when mold-boards are exchanged.

The end of the bunch in the mold-board is engaged by an ejector finger 138, Fig. 4, on a head 139 adapted to slide transversely on a fixed support 140, and said head is operated from shaft 130 by a segment thereon engaging a segment 141 on a vertical shaft 142 carrying arm 143 connected by link 144 to head 139. By this means the upper bunch is successively pushed out and drops on hopper 35 after the mold-board has been raised one notch step by step as just described.

The disk 85 for trimming the end of the cigar is kept in constant rotation by a line of mechanism beginning with gear 145 on shaft C, Fig. 6, pinion 146 on a short shaft 147 in mesh with said gear and a wheel 148 having a grooved periphery carrying a belt 149 adapted to make an angle around idlers Fig. 24 and run on a pulley 150 on shaft 151 carrying said cutter disk.

In order that the cigars may be cut to a given length

mechanism is provided for pressing them inward endwise after they have dropped into the discharge grippers, and to this end I provide a stop plate 153, Figs. 24 and 25, for the inner end of the cigar and a disk or head 154 on spring pressed shaft 155 which is adapted to be carried inward by its spring when tension on its end by cord 156 is released, and this occurs just after a cigar has been dropped into said grippers. The excess of length is severed by cutting disk 85. Cord 156 is fastened to the free end of pivoted lever 157 which is engaged by projection 158 on arm 89.

Another detail in mechanism is the device shown most clearly in Fig. 32 for throwing the rear end of the apron right or left more or less as the position of the rolling-board and the wrapper and other parts may require so as to keep said apron in right working relations therewith, and to this end I have made the bar 160 which supports the end of the apron on frame 77 laterally adjustable thereon subject to a return spring 161 when said bar is released. The bar is pushed over or forward when the rolling-board is in normal position and before the wrapping roller acts, and this is effected by a projection 162 on the rear of the rolling-board, Figs. 17 and 32, engaging a down finger 163 on the end of said bar 160. Then as the rolling-board shifts the said finger is released and spring 161 does its work.

Now, it is necessary to observe that the entire description of the invention has proceeded without any reference whatever to possible modifications here and there or equivalents for the parts shown, but it is also obvious that practically every distinct line or combination of parts to work out certain results here and there might be more or less materially changed and other mechanism substituted to do the same work. Indeed, the compacting of the machine to get it in a small compass or area has in some instances compelled either a strained or an indirect construction to possibly avoid other parts in the way or to get to a given position where crowding has made it difficult to reach. Therefore, the invention herein should be understood as residing quite as much in functions of the machine as in its mechanism, the automatic performance here and there and in the total being the chief thing in fact which has been wrought out in my mind and of which the mechanism is only one of many possible expressions.

In Figs. 5 and 6 I show a treadle 170 for controlling the clutch for the power shaft.

It will be noticed that what is regarded as the rear end of the rolling board is recessed or has a drop at  $g^2$ , Fig. 27, which is adapted to make room for the pocket that is formed at that point as the board recedes and slack is produced in the apron beneath the bunch roll, Fig. 18. The said wrapper roller likewise may be described as substantially bottle shaped having a cylindrical body of nearly uniform cross section though slightly larger in its middle and with somewhat lengthened tapering neck. The rolling board will be observed to have a line of perforations around about the opening for grating  $g$  and there are corresponding perforations around the die in the die-plate adapted to promote the holding of the tobacco leaf in place during the cutting operation.

Finally, in my pending application above referred to, the machine is shown as limited to all hand work, while in the present invention all hand work is eliminated



and an exclusively automatic power machine is substituted. In some of the details the two inventions are similar, while in others they differ materially, and the invention herein has to do with such modifications and improvements as were found necessary not only to make the machine automatic but to automatically take a bunch at one place and a wrapper at another and make a complete cigar therefrom and deliver it ready for use.

10 The term "power shaft" is understood to cover any shaft from which power is taken and is power impelled, whether it be a primary or a secondary or other driven shaft or its equivalent. In this machine all power comes through the single power driven or power conveying shaft C, but power might be distributed to other parts, and the actuating mechanism for making the machine automatic be taken therefrom. If this were done it is understood to be and mean practically what the claims call for in the term "power shaft," which is used in a comprehensive sense because at last a single shaft is the initial source of all power.

What I claim is:—

1. In cigar making machines, a power shaft, a rolling-board and means thereon to cut a wrapper, a wrapping-apron and a roller engaging said apron upon said rolling-board, means to deposit a bunch on said apron to be rolled and power conveying mechanism extending to said several parts from said power shaft.

2. In cigar making machines, means to make a complete cigar automatically comprising a horizontally oscillating rolling-board, a wrapping apron on said board, a horizontally swinging arm and a roller thereon adapted to engage said apron over said board, tension mechanism for said arm, and power connections operatively engaging said rolling-board, arm, and tension mechanism with said power shaft.

3. A machine for making cigars comprising means to cut the wrapper and paste the same, means to deposit a prepared bunch in position to be rolled and an apron and roller and rolling-board to wrap the bunch, a power shaft, and actuating mechanism operatively engaging the same with said several parts, whereby each part is caused to act automatically in its turn.

4. In cigar making machines, mechanism for automatically producing a completed cigar comprising a shaft from which all operating parts derive their power, a horizontally oscillating rolling-board and a wrapping apron thereon, means to cut the wrapper and means to roll the cigar in said apron consisting of a swinging arm and a roller thereon acting in connection with the rolling board to engage and double said apron upon itself thereby forming a pocket, a tension device for said apron, and mechanism connecting said operating parts with said power shaft.

5. In a cigar making machine, a rolling-board a power shaft and two different lines of mechanism connecting said board with said shaft, one of said lines consisting of means to move said board bodily back and forth and the other to oscillate the board.

6. In a cigar making machine, a rolling-board, a sliding carrier therefor and means to rotatably support the board on said carrier, in combination with a power shaft, mechanism connected therewith to operate said carrier, and mechanism operated from said shaft independently of said carrier to oscillate said board.

7. In a cigar making machine, a rolling-board, and a pneumatic chamber beneath the same, a sliding carrier in said chamber and a pivot post in said carrier supporting said board, in combination with a power shaft and operating mechanism extending therefrom to said carrier and operating mechanism from said shaft independent of said carrier mechanism adapted to oscillate said post.

8. In a cigar making machine, a rolling-board and a pneumatic chamber beneath the same, a sliding carrier in said chamber and a pivot post for said board in said car-

rier, in combination with a power shaft, means operatively connected therewith to actuate said shaft and mechanism engaged with said cam adapted to impart rotary movement to said post at predetermined times, thereby oscillating the rolling-board.

9. In a cigar making machine, a rolling-board and devices to impart direct and oscillatory movements in a horizontal plane to the board, in combination with a power shaft, cams thereon, and separate lines of mechanism connecting said shaft with said board operating devices.

10. In a cigar making machine, a rolling-board and a power shaft, and mechanism connecting said shaft with said board to operate the same, in combination with a horizontally swinging arm and a wrapping roller thereon, mechanism operatively connecting said arm with the power shaft, and a wrapping apron between said roller and rolling-board.

11. In a cigar making machine, a rolling-board a perforated wrapping apron thereon, and an exhaust chamber beneath said board, in combination with a die-plate and a vertically movable standard carrying the same, a horizontally movable cutter arm, a power-shaft, mechanism operated from said shaft and adapted to raise and lower said standard, and mechanism for swinging said arm operatively engaged with said shaft.

12. In a cigar making machine, a rolling-board, a movable grating occupying an opening in said board and a pneumatic suction chamber beneath said board and grating a perforated apron over said grating and board, a die-plate movable up and down in respect to said apron and board and carrying a die to cut wrappers, a cutting roller and a rotatable arm carrying the same, in combination with a power shaft and a cam thereon and mechanism engaged by said cam to rotate said arm and a separate line of mechanism operated from said shaft adapted to raise and lower said die-plate.

13. In a cigar making machine, a rolling-board and a slidable support therefor, and a die-plate and an upright standard carrying the same, in combination with a power shaft, mechanism to raise and lower said standard operatively engaged with said shaft and mechanism for moving said slidable support for the rolling-board operatively connected with the standard for the die-plate.

14. In a cigar making machine, a rolling-board having an opening through its body and a grating slidable up and down in said opening, and a die-plate having a die conforming in outline to the outer contour of said grating, in combination with a power shaft, mechanism actuated thereby adapted to raise said grating in the rolling-board and die-plate and mechanism adapted to raise and lower said die-plate operatively connected with said shaft.

15. In a cigar making machine, a rolling-board and means operatively connected therewith to hold a tobacco leaf to cut a wrapper, a die-plate having a cutting die adapted to be lowered upon said board, a standard carrying said plate, and a horizontally swinging arm carrying a cutter roller, in combination with a power shaft and a cam thereon and a pivoted arm engaged by said cam and pivotally connected with said standard and power actuated mechanism for swinging said arm.

16. In a cigar making machine, a rolling-board and a slidable support therefor, a die-plate and a standard supporting said plate over said board and means to hold a tobacco leaf upon said die-plate, in combination with a power shaft, actuating mechanism from said shaft connected with said standard, a hanger and link and rocker mechanism to operate said slidable support having actuating connection with said standard, and a power impelled cutter roller adapted to travel over said die-plate.

17. In a cigar making machine, a rolling-board having an opening down through its body, a grating and a support therefor in said opening, a power shaft and a line of mechanism operated thereby carrying said support, and adapted to raise and lower said grating support, in combination with one line of power actuated mechanism to reciprocate the rolling-board and another to oscillate the same.

18. In a cigar making machine, a rolling-board and a die-plate over the same and adapted to be raised and lowered in respect to said board, in combination with a power

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shaft, mechanism operated thereby to raise and lower said die-plate, a wrapper roller and an arm carrying said wrapper roller adapted to pass between said rolling-board and die-plate when separated, and power actuated mechanism to operate said arm.

19. In a cigar making machine, a rolling-board, a grating movable up and down therein, and a die-plate having a die conforming to the outline of said grating and adapted to seat around the same, in combination with a power shaft, a horizontally swinging arm, and a roller thereon adapted to run over said die, means operatively connected with said shaft to raise said die plate and other means operatively connected with said shaft to operate said arm.

20. In a cigar making machine, a rolling-board having an opening and a grating therein adapted to be raised and lowered in respect to the top of said board, a die-plate adapted to rest upon said board and having a raised cutting edge standing about said grating, and a horizontally swinging arm and a roller on said arm adapted to run over said cutting edge, in combination with means to automatically operate said arm consisting of a power shaft and devices operatively engaged therewith to cause said arm to move to and fro at fixed intervals.

21. In a cigar making machine, a rolling-board having an opening therein and a guide arm on its bottom, a vertically movable grating within said opening; having a stem moving vertically in said guide arm, in combination with a power shaft, means operatively connected therewith to move said rolling-board and a separate line of power actuated mechanism adapted to raise said grating in said board.

22. In a cigar making machine, a suitable table and a rolling-board having an oscillating and rectilinear movement thereon, an arm carrying a bunch roller and adapted to travel in an arc horizontally over said board, in combination with a power shaft, lines of mechanism to actuate said board rectilinear and rotarily and a separate line of mechanism from said shaft to actuate said arm.

23. In cigar making machine, a table and a rolling-board thereon having a movable pivot slidably supported in said table, and an arm carrying a bunch-roller pivoted in position to sweep over said board in the arc of a circle, in combination with a power shaft, and connected mechanism therefrom operatively engaging said movable pivot for the rolling-board and mechanism connecting said arm operatively with said shaft.

24. In a cigar making machine, a table and a rolling-board thereon, a reciprocating pivot for said board and means to cause said board to rotate on its pivot, in combination with a power driven shaft, operating mechanism connected to said reciprocating pivot and means operated by said shaft to cause the board to oscillate on its pivot.

25. In a cigar making machine, a suitable table, a rolling-board, a pivot for said board and a slidable support for said pivot, whereby said board is adapted to move horizontally over said table in combination with a power shaft and means actuated thereby connected with said slidable support.

26. In a cigar making machine, a rolling-board and a pivot support on which the board is adapted to rotate, said board being provided with means to limit its rotation, in combination with a rotatable device to rock said pivot support and a power shaft and mechanism to actuate said rotatable device.

27. A table and a chamber beneath the same having guide ways horizontally in its sides, a support slidable rectilinearly in said ways and a pivot-post rotatably engaged in said support, a rolling-board operatively engaged by said post and means to actuate said board through said mechanism rectilinearly and rotarily.

28. In a cigar making machine, a table, a rolling board thereon and mechanism to give said board a rectilinear and an oscillating movement at the same time, said mechanism comprising a single rotatable and rectilinearly slidable post, in combination with power actuated mechanism engaging said post.

29. In a cigar making machine, a table and a suction chamber thereon, a rolling-board and mechanism supported in said chamber to simultaneously move said board rectilinearly and rotarily, in combination with a power shaft,

and means operated thereby to impart power to said board operating mechanism.

30. In a cigar making machine, a rolling-board having an opening through the same, and a depressed portion at one end of said opening, a grating filling said opening and a perforated apron extending over said board and attached thereto at one end, a movable support for the other end of said apron, and an arm and wrapper roller on said arm adapted to double the apron upon itself over said depressed portion of the rolling-board and form a pocket, in combination with power actuated mechanism for all said operative parts respectively.

31. In a cigar making machine, a table and a rectilinearly movable and oscillating rolling-board thereon, a perforated apron over said board, an arm and a bunch roller acting thereon over a doubled portion of said apron, in combination with a power shaft, and mechanism actuated thereby to move said rolling board and said arm simultaneously.

32. In a cigar making machine, a rolling-board and means by which said board is given varying rectilinear and oscillating movements, a perforated bunch rolling apron on said board, and one arm and bunch roller thereon movable in an arc over said board and apron, a tension device for one end of said apron on a plane above said roller, in combination with power actuated mechanism adapted to slide and oscillate the rolling-board and to actuate said arm simultaneously.

33. In a cigar making machine, a rolling-board and means whereby said board is given rectilinear and oscillating movements simultaneously, an apron over said board adapted to be doubled to form a pocket for a bunch, and an arm and tapered bunch roller acting thereon, in combination with a power shaft, a line of mechanism to give said board its movements, mechanism to rotate said arm and a power shaft actuating said mechanism.

34. In a cigar making machine, a rolling-board, a rolling apron on said board and a bunch roller acting upon said apron, in combination with devices to move the rolling-board rectilinearly and rotarily and to actuate said bunch-roller over said board simultaneously, and a power shaft with which said devices have actuating connection.

35. In a cigar making machine, a rolling-board and a reciprocating support therefor on which said board is adapted to oscillate, and means to give said board simultaneous rectilinear and oscillating movements, an apron on said board and a tension device connected with one end thereof and the other end fixed to said board, and means to roll the bunch comprising a rotatable arm and a roller thereon bearing on said board and acting upon said apron and adapted to swing away from said tension device, whereby the apron is stretched over said roller, in combination with a power shaft and different lines of mechanism therefrom operatively connected with said arm and rolling-board.

36. In a cigar making machine, a rectilinearly movable and oscillating rolling-board, a tension device, an apron attached to said device at one end and to said board at its other end, and a bunch roller pivoted to travel in an arc over said rolling-board and acting upon said apron, in combination with a power shaft and means operatively engaged thereby and adapted to relieve said tension device of its tension at intervals automatically.

37. In a cigar making machine, a rolling-board, a die-plate over said board, a wrapper cutting roller adapted to run over said plate when down and means to hold the wrapper on said rolling-board when cut, in combination with a power shaft mechanism carrying said die-plate operatively connected with said die-plate and adapted to raise said plate after a wrapper has been cut thereon, and mechanism operated from said shaft adapted to roll said wrapper on a bunch.

38. In a cigar making machine, a rolling-board, a plate carrying a die to cut a wrapper, a horizontally movable arm and a cutter roller thereon adapted to run upon the edge of said die and cut the wrapper, suction mechanism operating through said rolling-board to hold the cut wrapper and means to raise said die-plate comprising a standard on which said plate is mounted and an apron and roller to wrap the cigar, in combination with means for



operating the said parts by power automatically comprising a power shaft, means connected therewith to raise and lower said die-plate standard and to operate the rolling-board and the said rollers.

39. In a cigar making machine, a rolling-board and means therewith to hold a cut wrapper on the board, a pasting device adapted to deliver paste upon the wrapper, a gripper to place a bunch on the wrapper and means to roll the wrapper on the bunch, in combination with a power driven shaft, and lines of actuating mechanism connected operatively with said shaft and extending thence to said bunch delivering and rolling mechanism and to the wrapper and bunch grippers severally.

40. In a cigar making machine, a rolling-board and means to hold a cut wrapper thereon, a perforated apron on said board, a wrapper cutting die over said apron, and a cutter roller adapted to run upon the edge of said die, in combination with a power shaft, mechanism operated therefrom to actuate said cutter roller and mechanism operated by said shaft to raise said die after said roller has been retired, said mechanisms timed to act successively.

41. In a cigar making machine, a rolling-board adapted to be variously moved thereon, a tension device carrying one end of said apron the other being attached to said board, and a wrapper roller behind said apron and beneath said tension device, in combination with a power shaft, mechanism operated from said shaft and engaging the rolling-board to move the same rearward and form a pocket in the apron behind said roller, and means to automatically actuate said roller and oscillate said board.

42. In a cigar making machine, a rolling-board and a suction device beneath the same, an apron attached at one end to said board and to a pivoted tension device at the other, a bunch roller pivoted to travel upon said apron and board and a reciprocating carrier for said board adapted to move said board rectilinearly rearward under said roller and provide slack in said apron to form a bunch receiving pocket, and means to place a bunch in said pocket, in combination with automatic mechanisms to operate said parts successively, and a power shaft with which said mechanisms are connected.

43. In a cigar making machine, a table and rolling-board rectilinearly and horizontally movable thereon, a grating in said board, a perforated apron over said board and means to cause suction through said board, in combination with a horizontally movable arm and a bunch roller thereon, a power shaft and mechanism for automatically operating said parts connected with said shaft.

44. In a cigar making machine, a rolling-board having an opening and a vertically movable grating therein, means to slide said board and means to raise said grating as said board is moved along, said means comprising a power shaft and mechanism operated therefrom adapted to raise said part automatically at predetermined intervals.

45. In a cigar making machine, a bunch mold having a series of pockets for bunches, means to partially dislodge said bunches from their mold, means to confine the bunches at one end, and separate means to dislodge one bunch at a time.

46. In a cigar making machine, a bunch mold provided with a series of bunch pockets on its face open at the front and a vertical carrier for said mold, means to partially dislodge all the bunches simultaneously and means to release one bunch at a time as the mold is moved upward, in combination with means to receive the bunch from the mold.

47. In a cigar making machine, a bunch mold and means therein to release the bunches from the mold, a vertically slidable carrier on which the mold is removably mounted and an automatically operated device to remove the bunches from the mold successively as the mold is raised.

48. In a cigar making machine, a bunch mold and means therein to release the bunch, a carrier for said mold and a device on said carrier at one side of said mold to confine the bunches at one end and a device to remove the bunches successively from the mold as the mold is raised.

49. In a cigar making machine, a bunch mold and a vertically movable carrier supporting the mold, and means to remove the bunches from the mold, in combination with

a receptacle from which the bunches are fed to the machine, and a chute from the said mold to said receptacle.

50. In a cigar making machine, a bunch rolling and wrapping mechanism, a receptacle for bunches and gripping mechanism to convey the bunch endwise to the rolling mechanism.

51. In a cigar making machine, a rolling and wrapping mechanism, in combination with bunch grippers constructed to engage a bunch at its end and means to feed said grippers forward and to actuate the same to deposit the bunch into the rolling and wrapping sphere of action.

52. In a cigar making machine, the combination of the rolling and wrapping mechanism with a receptacle for bunches at one side of said mechanism, and a gripper with fingers to seize a bunch at its end and move it bodily to the said rolling and wrapping mechanism.

53. In a cigar making machine, rolling and wrapping mechanism for the cigar, in combination with a receptacle for the bunches constructed to carry the bunches one above the other, and means to convey the lower bunch from the receptacle to said mechanism to be rolled.

54. In a cigar making machine, means to wrap a bunch, and a device to deliver the bunch thereto comprising gripping fingers adapted to lay hold of one end of the bunch and means to tighten and loosen said fingers.

55. In a cigar making machine, suitable bunch wrapping and rolling mechanism, in combination with a gripper constructed to carry a bunch endwise to said mechanism and means to automatically release and return said gripper.

56. In a cigar making machine, a gripping mechanism to deliver a bunch comprising a receptacle constructed to hold the gripper axially in line to grip the lower bunch and move it endwise to rolling and wrapping position.

57. In a cigar making machine, a receptacle constructed to support the bunches in a single column, means to grip and carry the lower bunch to the machine, and means to hold back the remaining bunches while said gripping means are at work.

58. In a cigar making machine, a cigar rolling and wrapping mechanism, in combination with a bunch receptacle, a device to deliver a bunch therefrom to the machine comprising a gripper, means to hold back the body of bunches while said gripper operates and means to carry said gripper back and forth.

59. In a cigar making machine, a bunch carrying mold, a vertically movable carrier for said mold and means to remove the bunches successively from the mold, in combination with a bunch receptacle, a gripper to deliver bunches therefrom and a carrier for the gripper.

60. In a cigar making machine, a bunch carrying mold and means to move said mold vertically and discharge the bunches therefrom, in combination with a bunch receptacle and means to deliver the bunches thereto from the said mold, a device to deliver one bunch at a time from said receptacle to the machine and means to hold back the accumulated bunches.

61. In a cigar making machine, a rolling board, a wrapper roller adapted to travel over said board in an arc, an elastic rolling apron attached to said board at one end and a tension device carrying the other end of said apron, and means on said tension device to slide the attached end of the apron laterally thereon.

62. In a cigar making machine, a die-plate, a horizontally movable arm and a cutter roller thereon, and a pivoted bridge controlled by said roller and adapted to lap over upon said plate.

63. In a cigar making machine, a rolling-board and a die-plate thereon with a cutter roller and a bridge plate controlled by said roller, and adapted to rest over the edge of said plate.

64. In a cigar making machine, a rolling-board and a die-plate thereon, a horizontally rotatable arm carrying a cutting roller, and a bridge plate controlled by said roller and having a wing at its rear through which it is raised by the roller.

65. In a cigar machine, a rolling board, a vertically movable die-plate having an opening with a cutting edge about its top, a wrapper cutting roller adapted to travel over said die-plate cutting edge, and mechanism for auto-

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matteally operating said cutting roller and die-plate successively, whereby a wrapper is cut and deposited upon the rolling board and the die plate is raised.

5 66. In a cigar machine; a movable rolling board and a wrapping apron thereon, a vertically movable die-plate having an opening with a cutting edge at its top, a wrapper cutting roller adapted to travel over said die  
10 plate cutting edge, a wrapping roller adapted to travel over said rolling-board, and a power shaft and separate lines of operating mechanism for said rolling-board, die-plate, cutting roller and wrapping roller, respectively, whereby said parts are automatically operated in timed order.

15 67. In a cigar machine, a movable rolling-board, an elastic apron extending over said board and fastened thereto at one end, a horizontally movable arm and a roller thereon adapted to describe an arc over said board, and tension mechanism connected with the other end of said apron, in combination with a power shaft and  
20 operating mechanism connected therewith and with said rolling-board, arm and tension mechanism, respectively.

25 68. In a cigar machine, a rectilineally movable and oscillating rolling-board having an opening therein, and a vertically movable grating in said opening, in combination with a power shaft and operating mechanism connected therewith and with said rolling-board and said grating.

30 69. In a cigar making machine, a supporting table, and a rectilineally movable and oscillating rolling-board thereon, in combination with a power shaft and mechanism connected therewith to operate said rolling board.

35 70. In a cigar machine, a table and a rectilineally movable and oscillating rolling-board thereon, a perforated apron overlying said board and engaged therewith at one end, a tension device for the other end of said apron, and a swinging arm and a roller thereon adapted to engage said apron, in combination with power mechanism for automatically operating all said parts.

71. In a cigar machine, a rectilineally movable and

oscillating rolling-board, an elastic apron attached to said board, a tension device for one end of said apron, and a 40 wrapping roller, in combination with a power shaft and operating mechanism connected therewith and with said rolling-board, tension device and said wrapping roller, respectively.

45 72. In a cigar machine, a rolling-board, a set of gripping fingers adapted to receive the cigar, an oscillating support for said fingers, a rotary trimming disk for the end of the cigar, operating mechanism for said oscillating support, and means adapted to separate said fingers at the end of the oscillating movements of their support. 50

50 73. In a cigar machine, a rolling-board, grippers to receive the cigars therefrom, an alining device adapted to engage one end of the cigar when within the grippers, a rotary cutter for the cigar, and means adapted to oscillate said grippers past said rotary cutter. 55

74. In an automatic cigar machine, a rolling-board and a wrapping apron thereon, and mechanism for cutting the wrapper as it lies upon the apron, in combination with mechanism adapted to feed molded bunches to said apron, and mechanism adapted to roll the cut wrapper 60 upon the bunch.

75. In an automatic cigar machine, a rolling-board and a perforated wrapping apron thereon, suction means adapted to hold the tobacco leaf upon the apron, automatic means to cut a wrapper from the leaf as it is 65 held upon said apron, a bunch-mold and mechanism for feeding completely formed single bunches therefrom to said rolling-board and said apron, and means to wind the wrapper upon each bunch.

In testimony whereof I sign this specification in the 70 presence of two witnesses.

LESTER A. SCHAEFFER.

Witnesses:

EUGENE G. KENNEDY,  
CHAS. H. SCHAEFFER.