

No. 651,845.

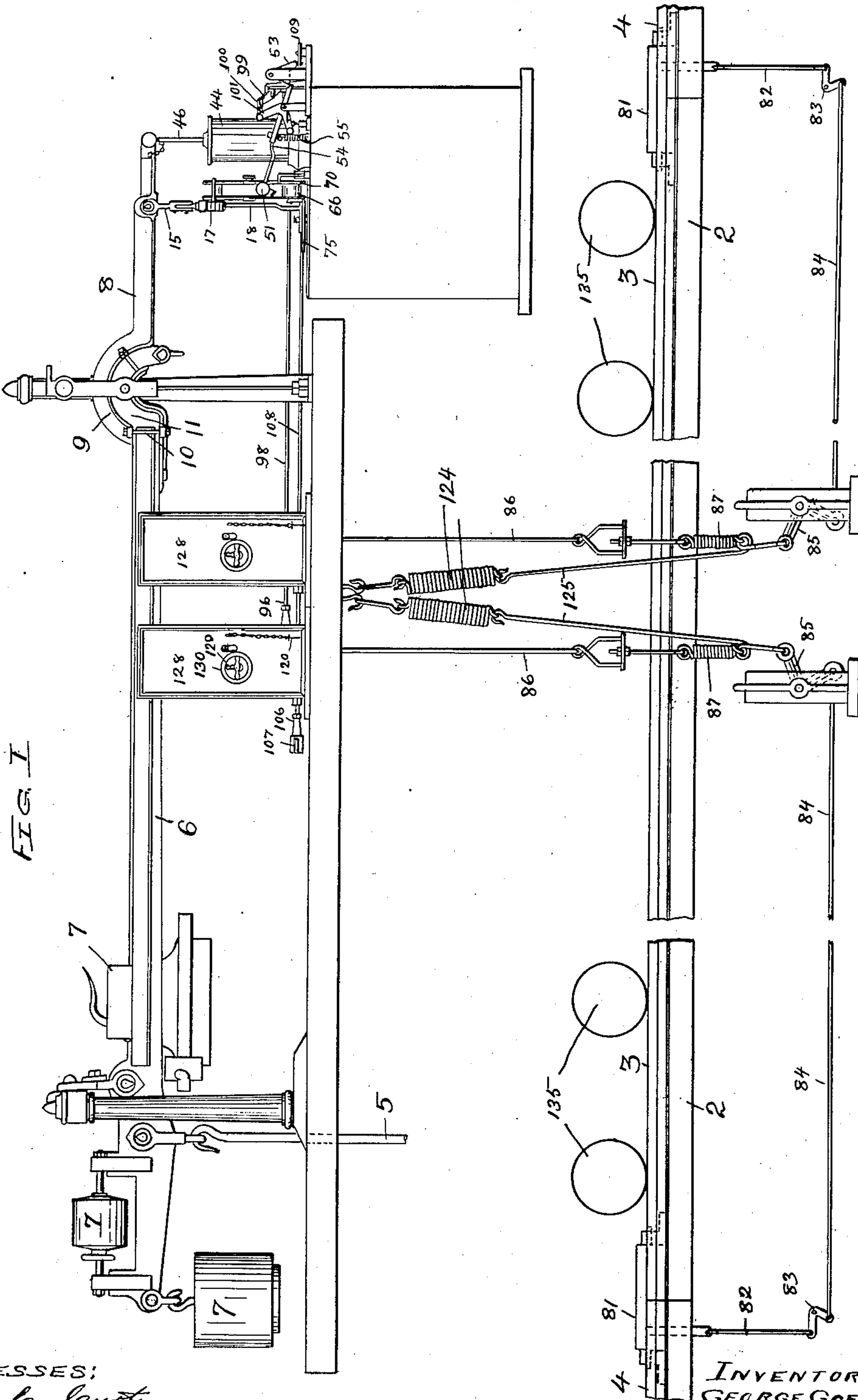
Patented June 19, 1900.

G. GOETZ.
RECORDING CAR SCALE.

(Application filed Mar. 12, 1900.)

(No Model.)

14 Sheets—Sheet 1.



WITNESSES:

Lew. C. Curtis

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INVENTOR:
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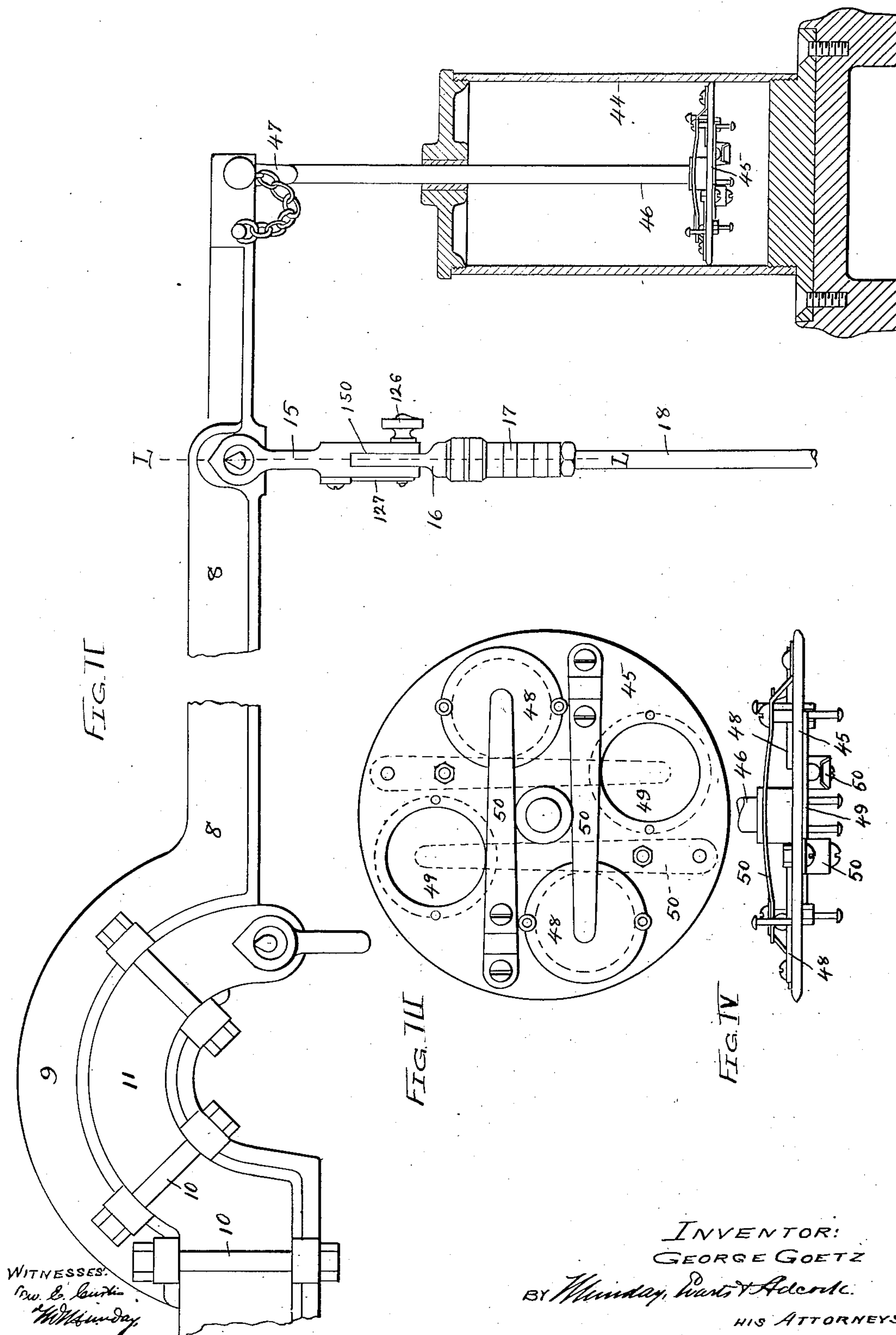
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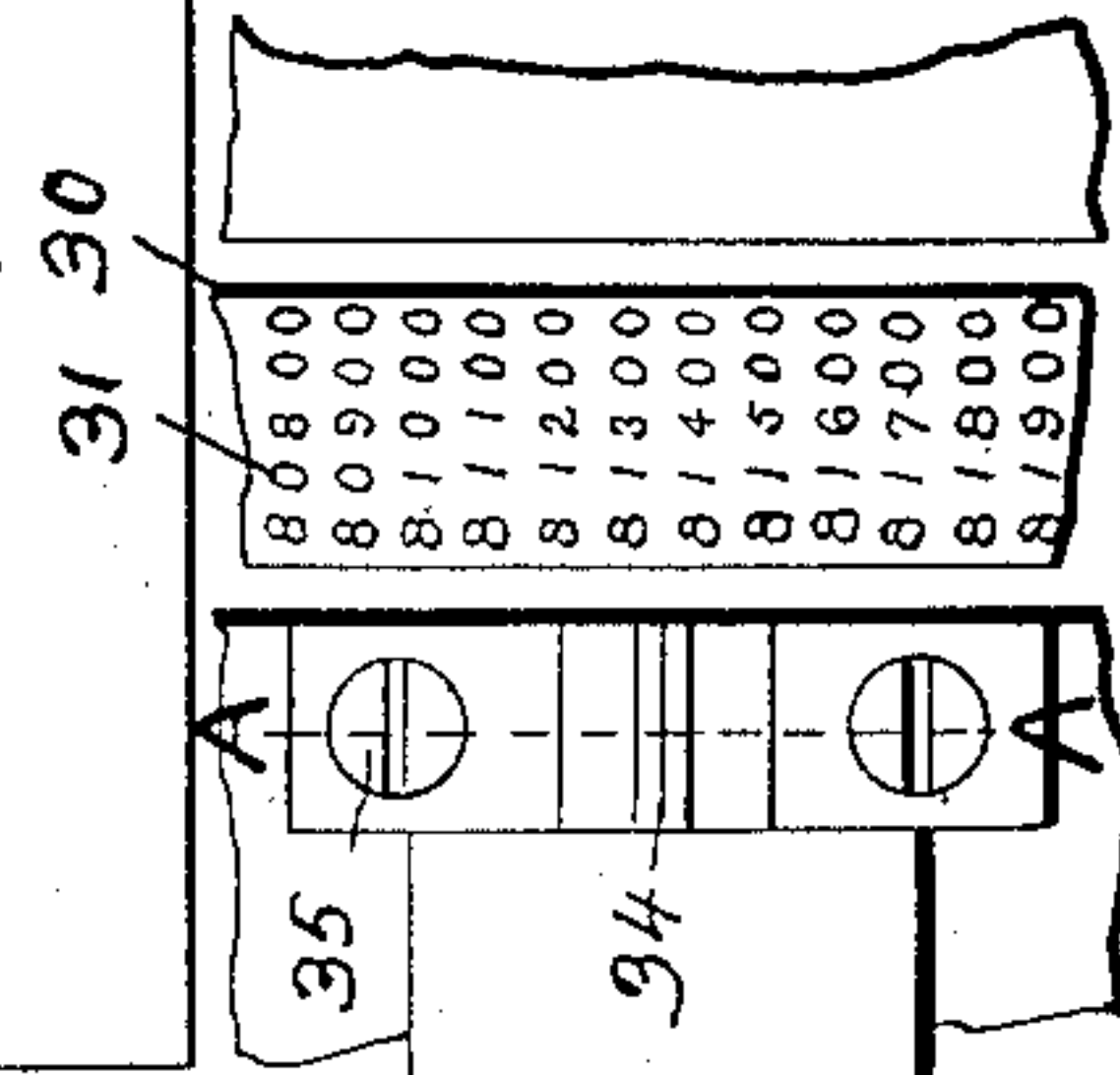
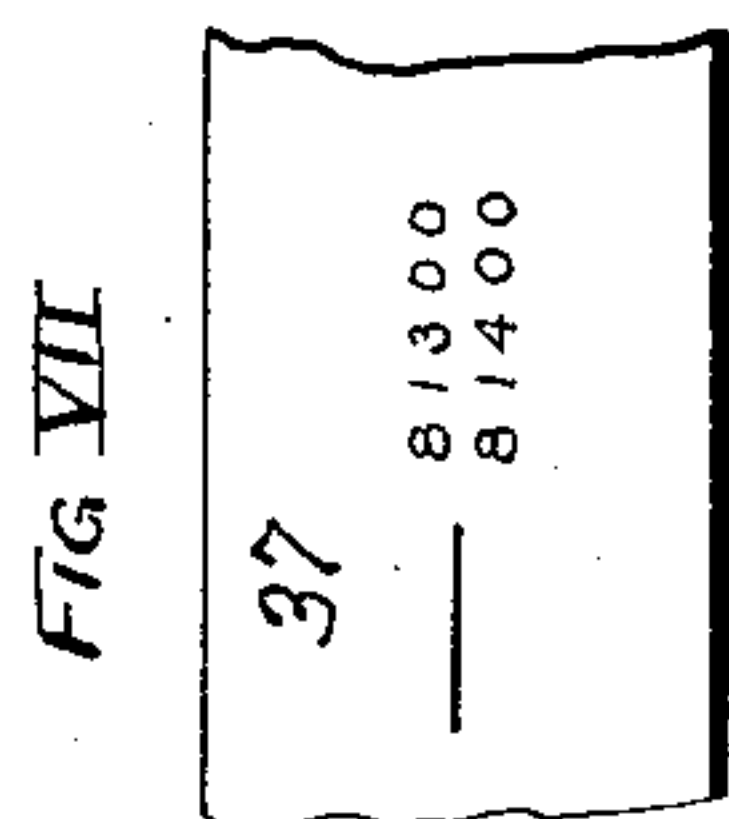
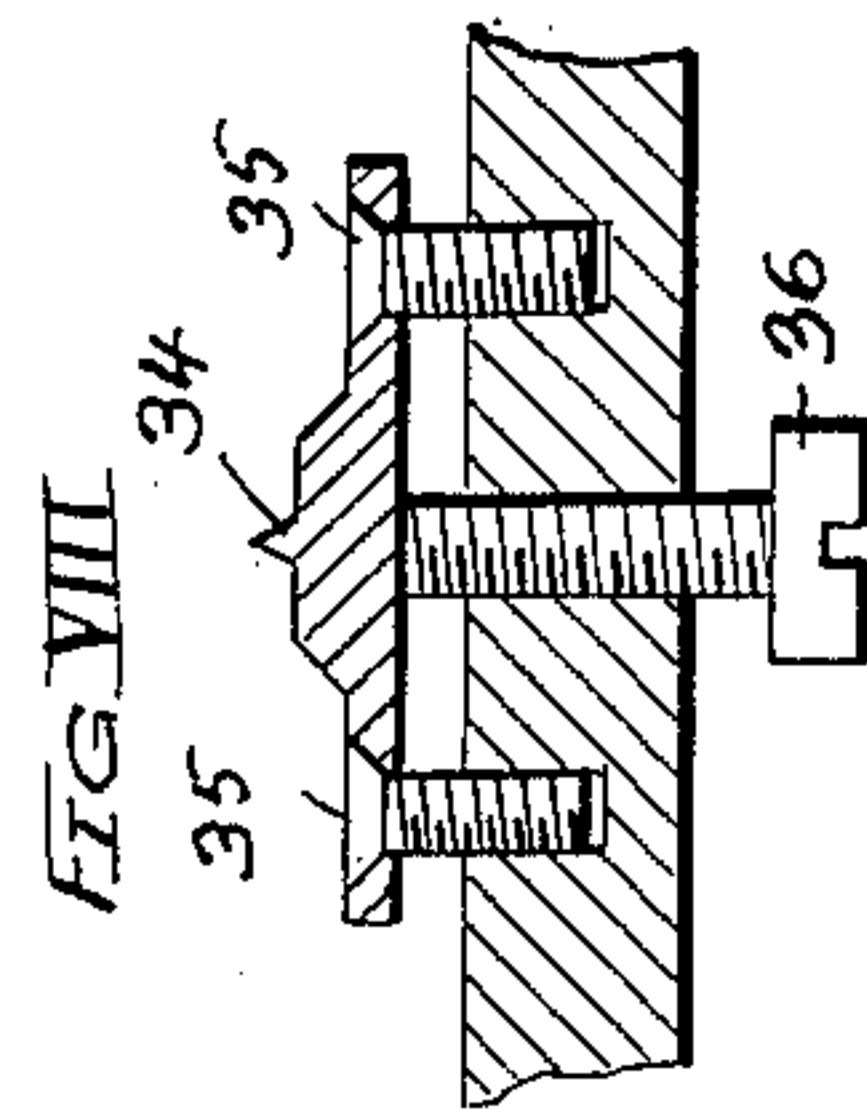
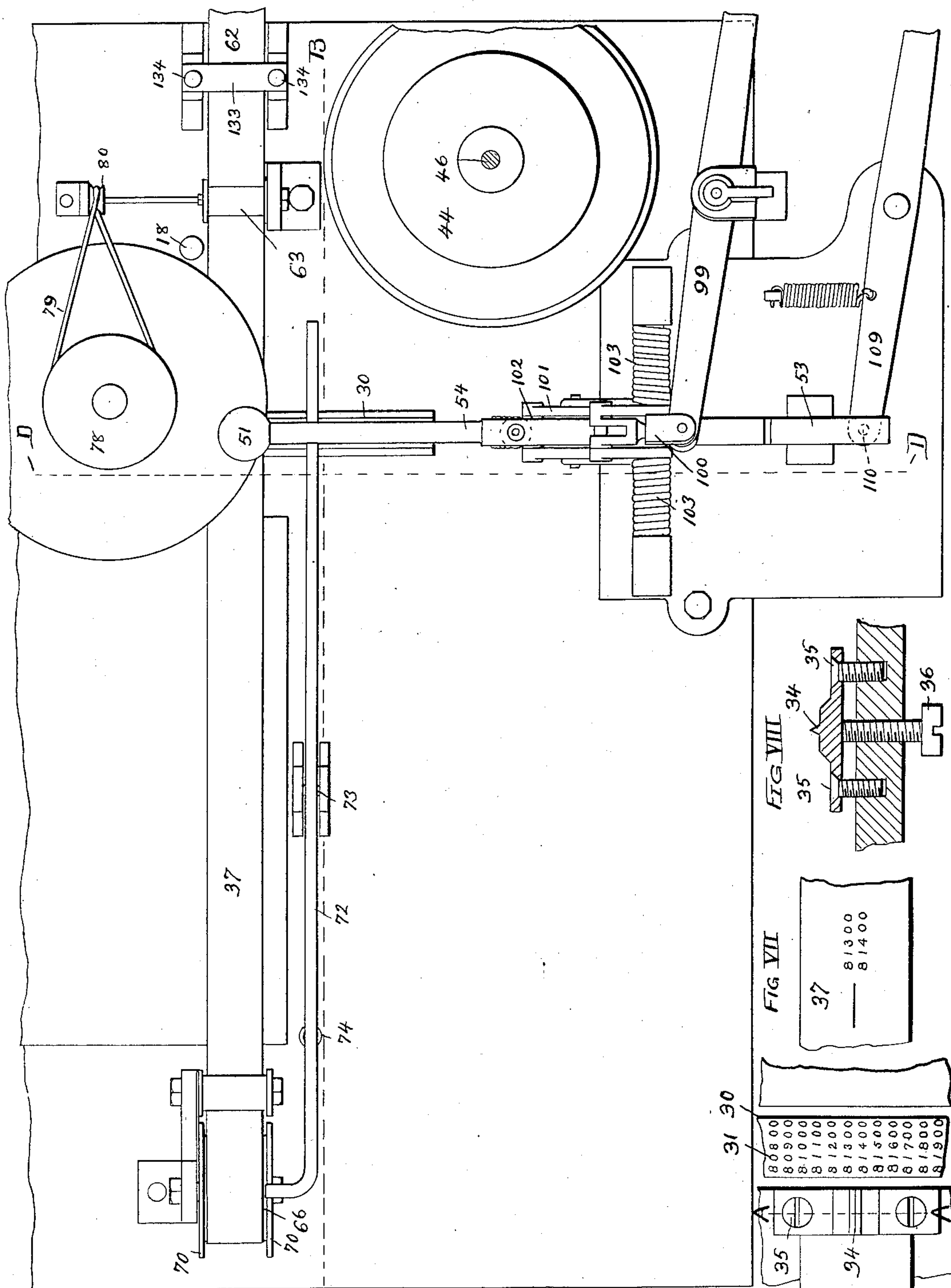
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(No Model.)

14 Sheets—Sheet 3.



WITNESSES:
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FIG. V

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No. 651,845.

Patented June 19, 1900.

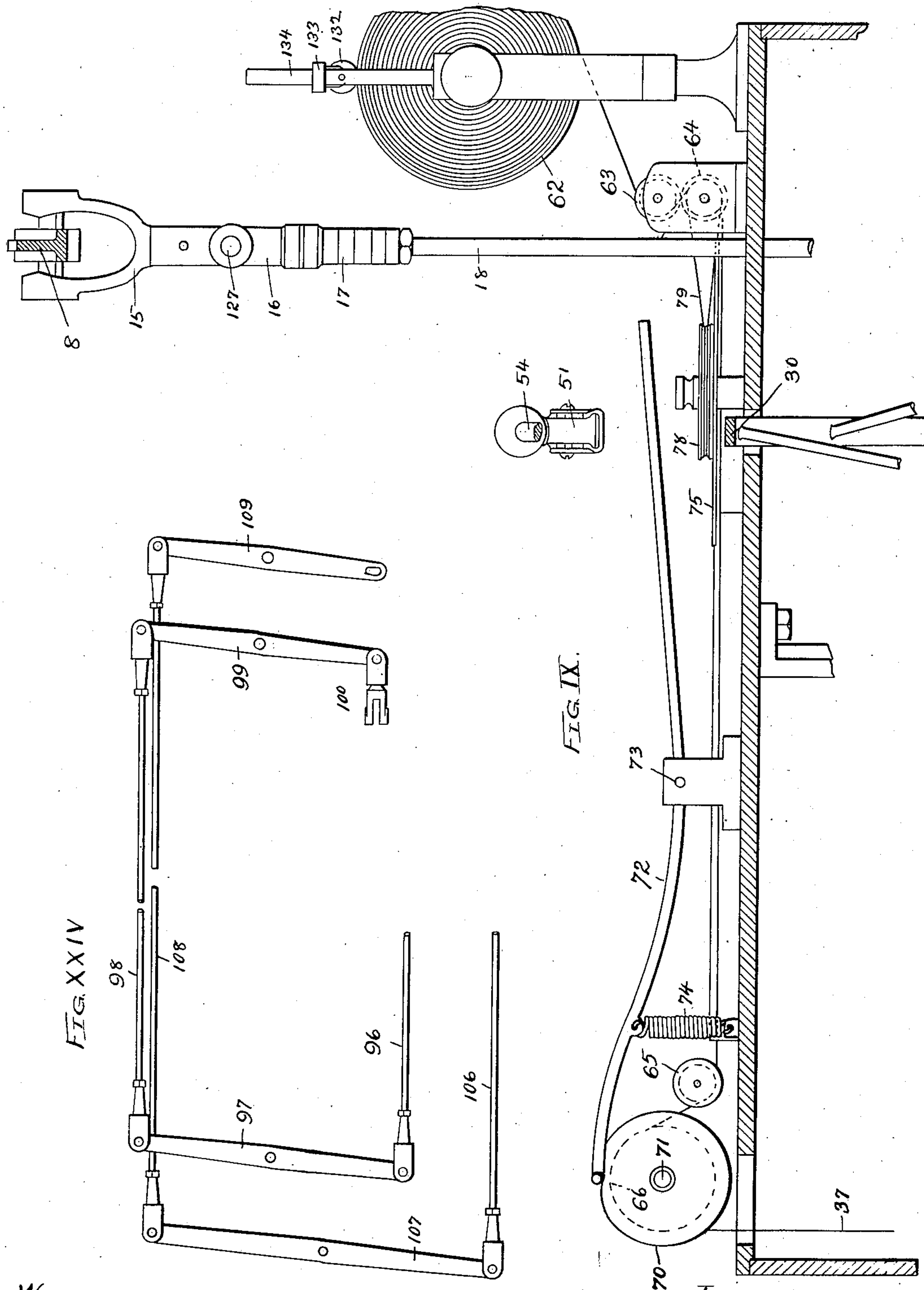
G. GOETZ.

RECORDING CAR SCALE.

(Application filed Mar. 12, 1900.)

(No Model.)

14 Sheets—Sheet 4.



WITNESSES:
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No. 651,845.

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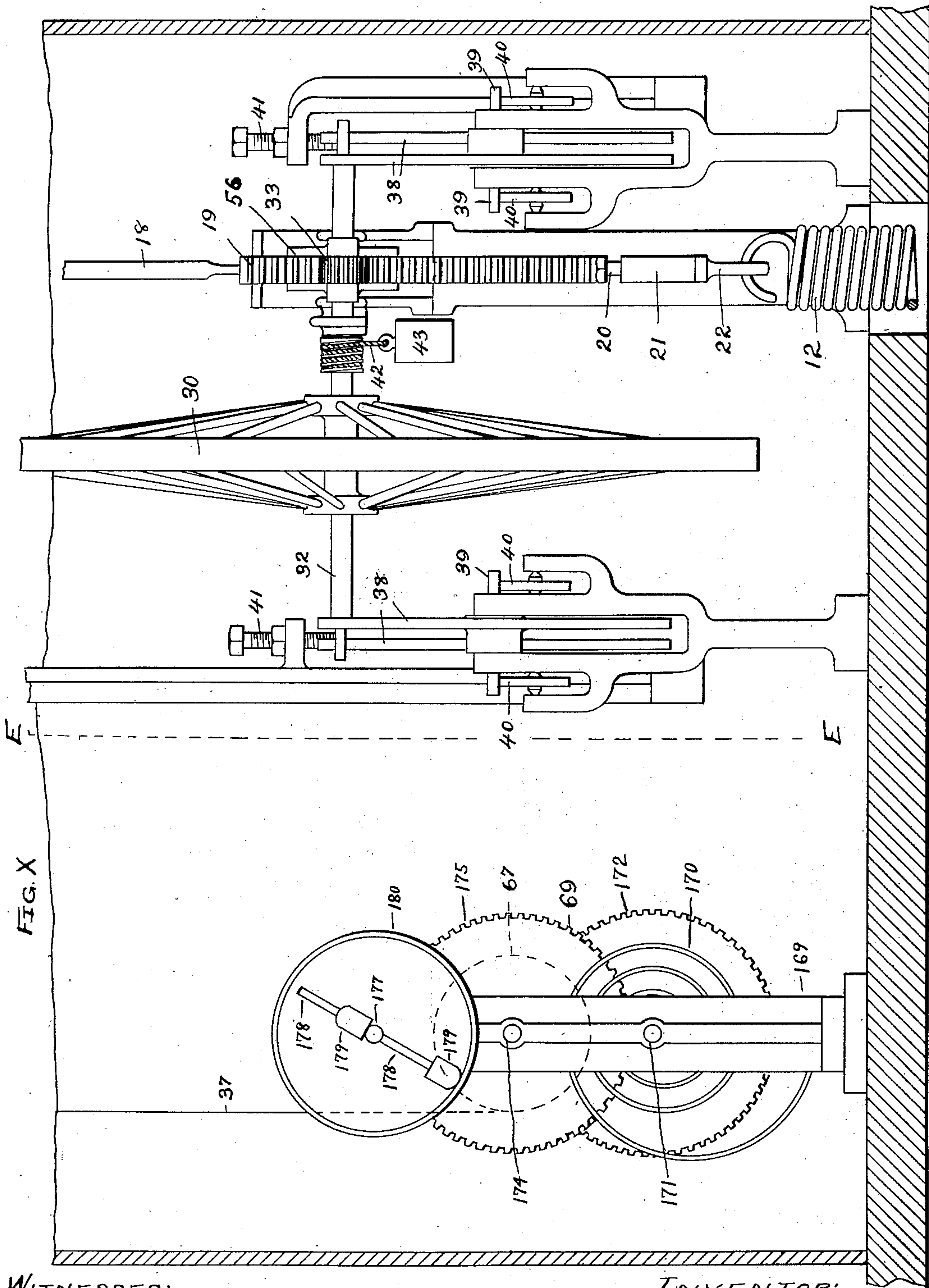
G. GOETZ.

RECORDING CAR SCALE.

(Application filed Mar. 12, 1900.)

(No Model.)

14 Sheets—Sheet 5.



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No. 651,845.

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(Application filed Mar. 12, 1900.)

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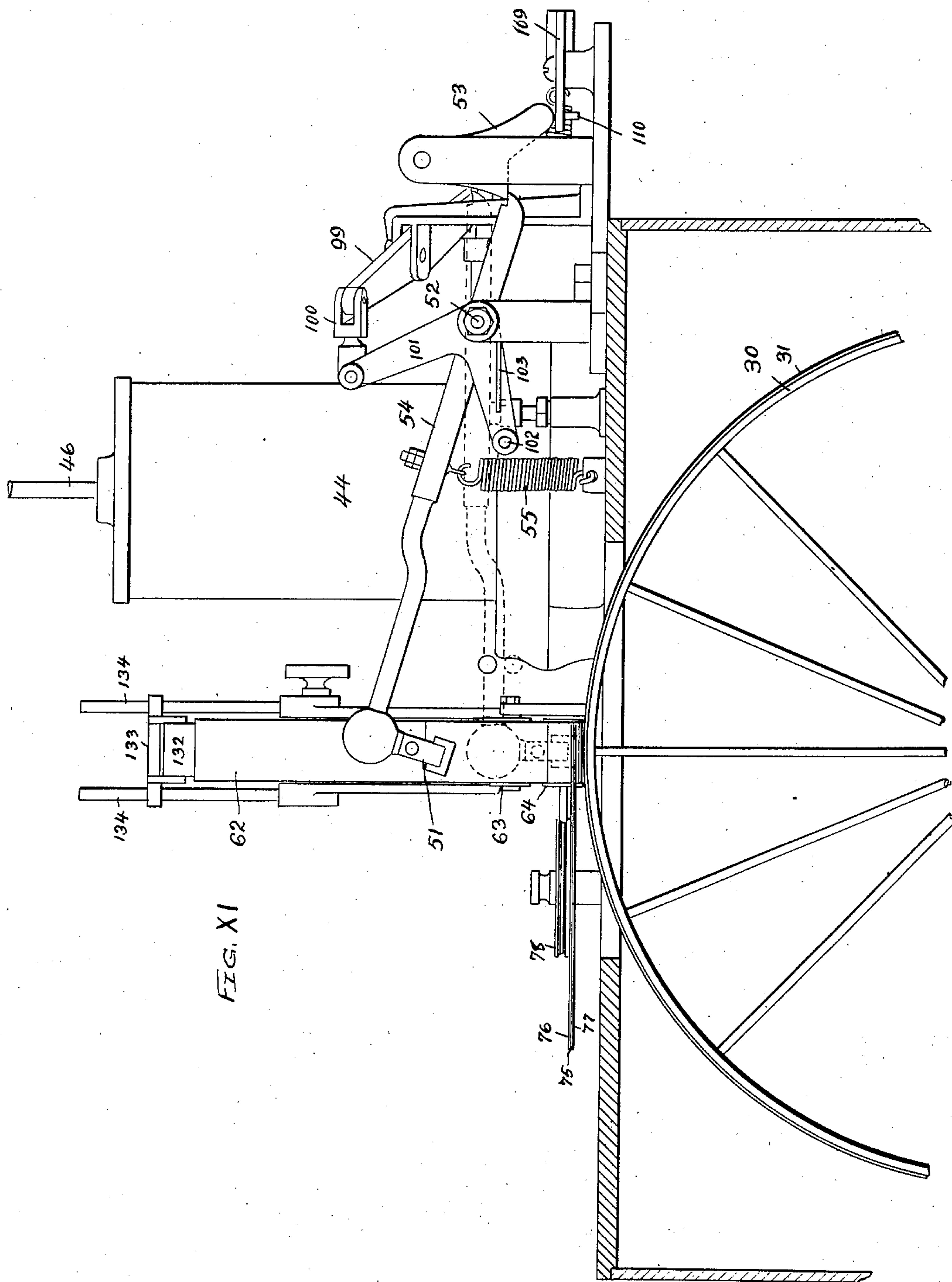


FIG. XI

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No. 651,845.

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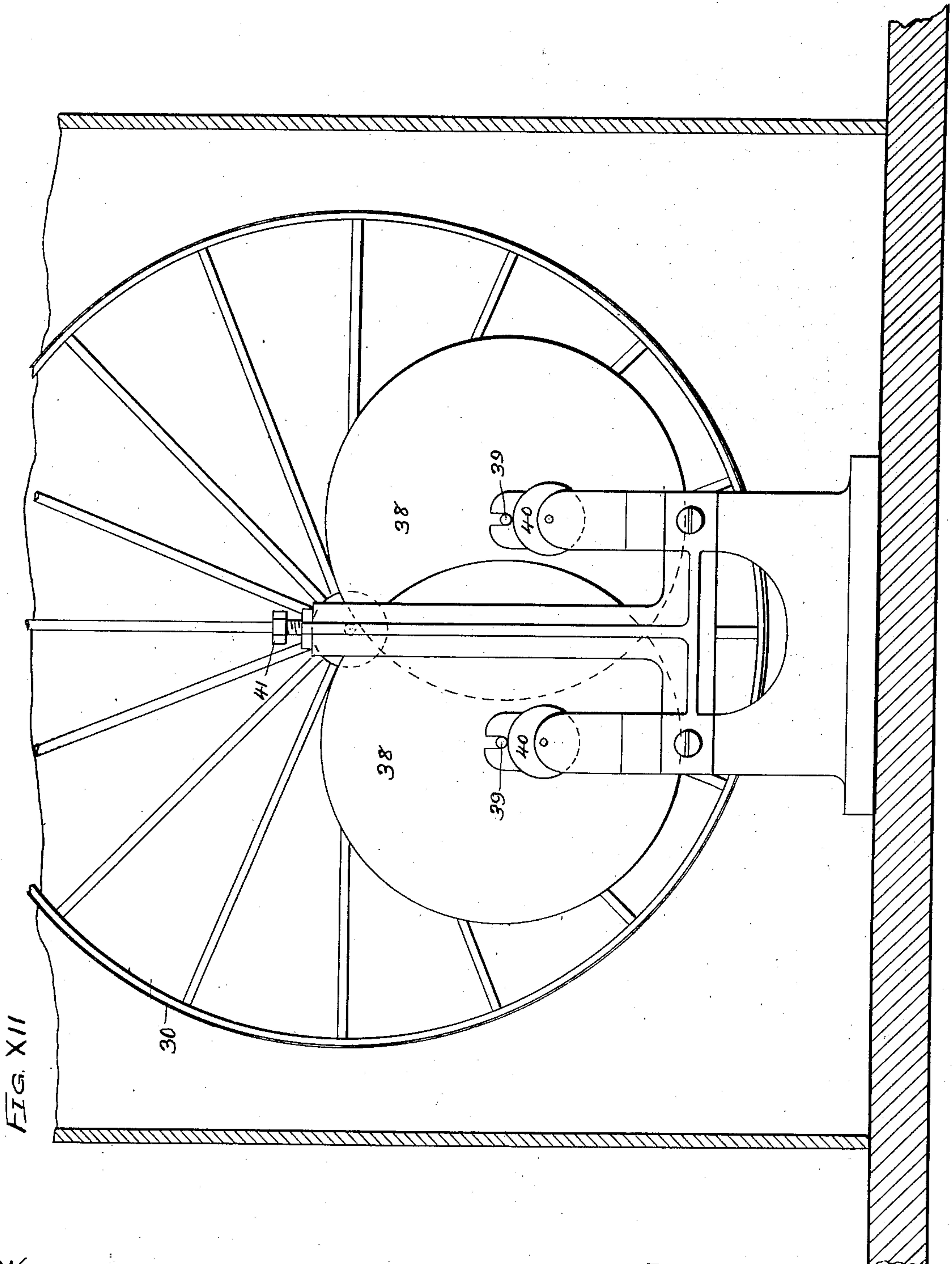
G. GOETZ.

RECORDING CAR SCALE.

(Application filed Mar. 12, 1900.)

(No Model.)

14 Sheets—Sheet 7.



WITNESSES:

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No. 651,845.

Patented June 19, 1900.

G. GOETZ.

RECORDING CAR SCALE.

(Application filed Mar. 12, 1900.)

(No Model.)

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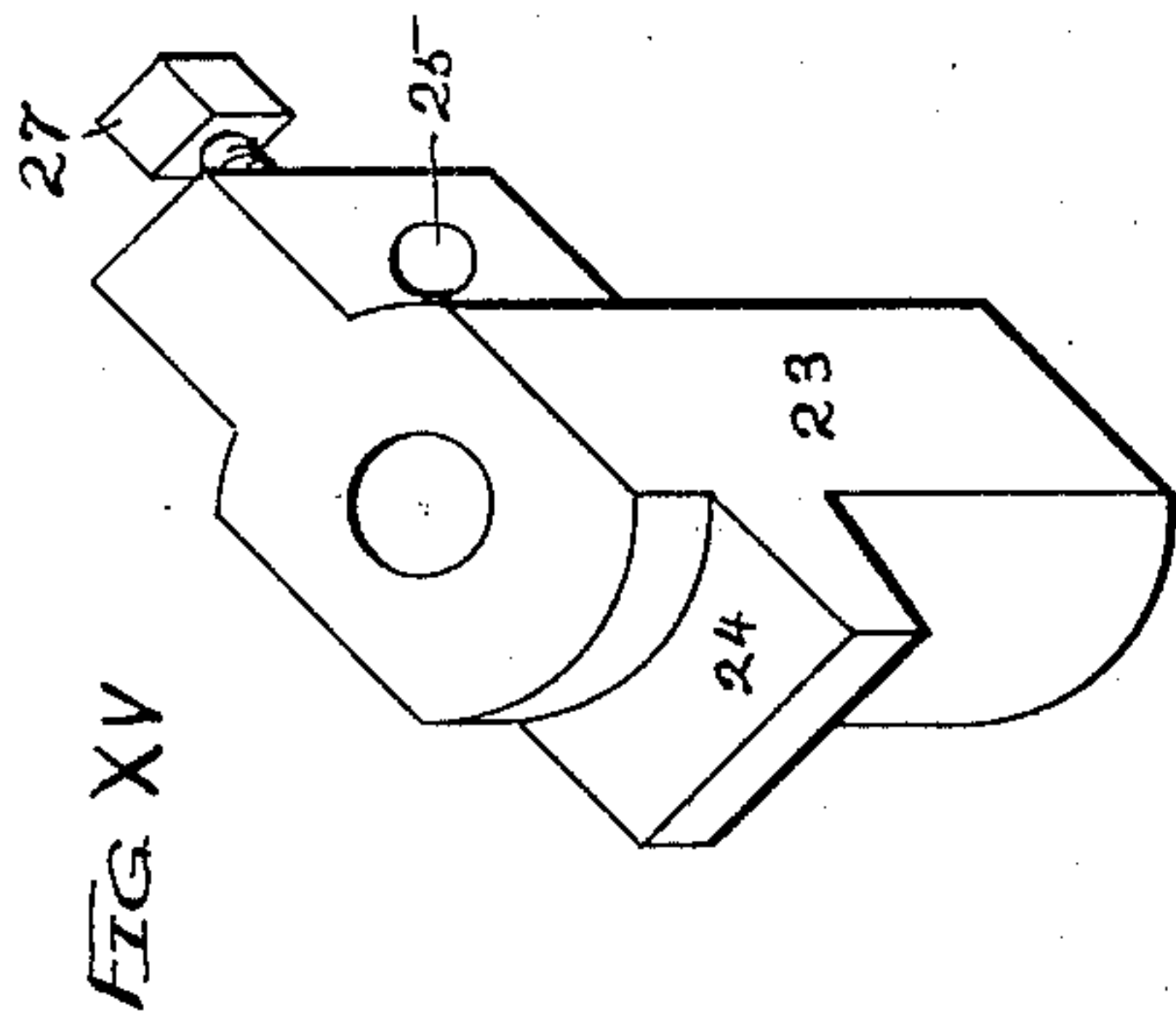


FIG. XVI

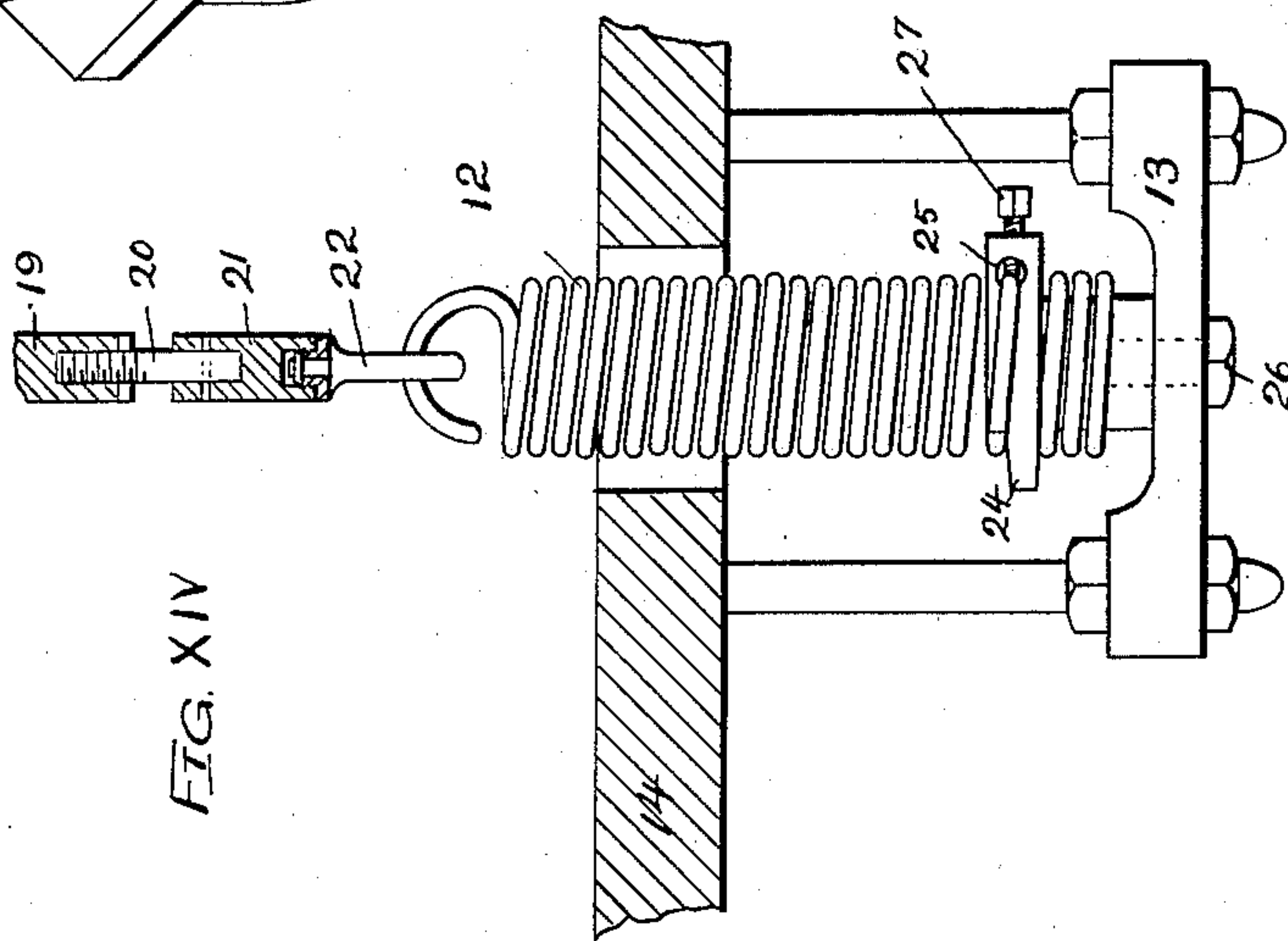
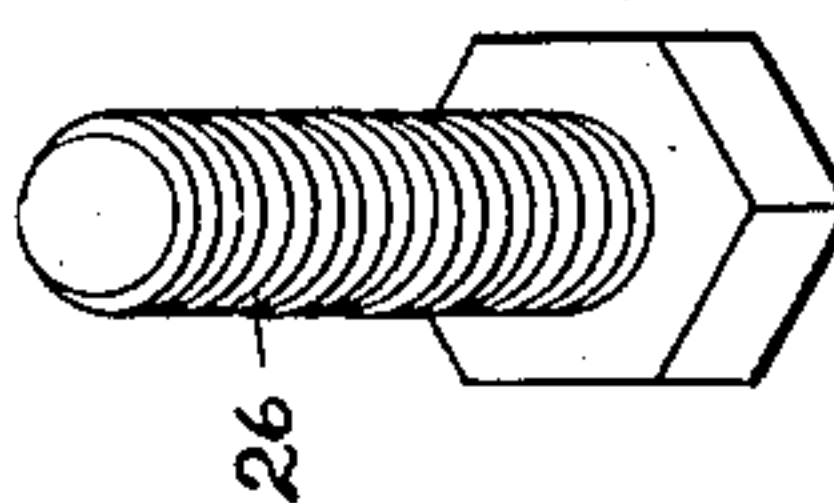
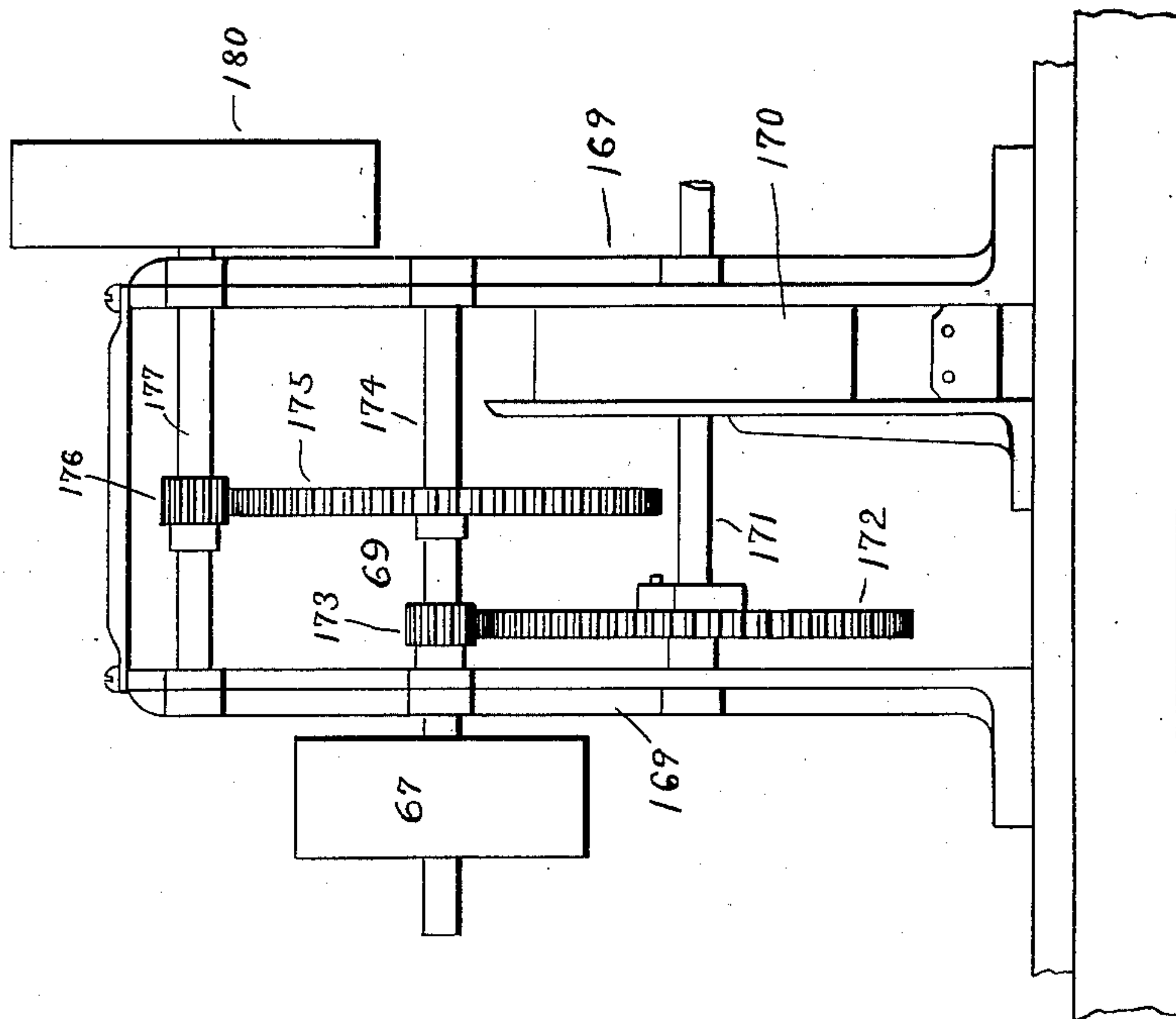


FIG. XIII



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No. 651,845.

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G. GOETZ.
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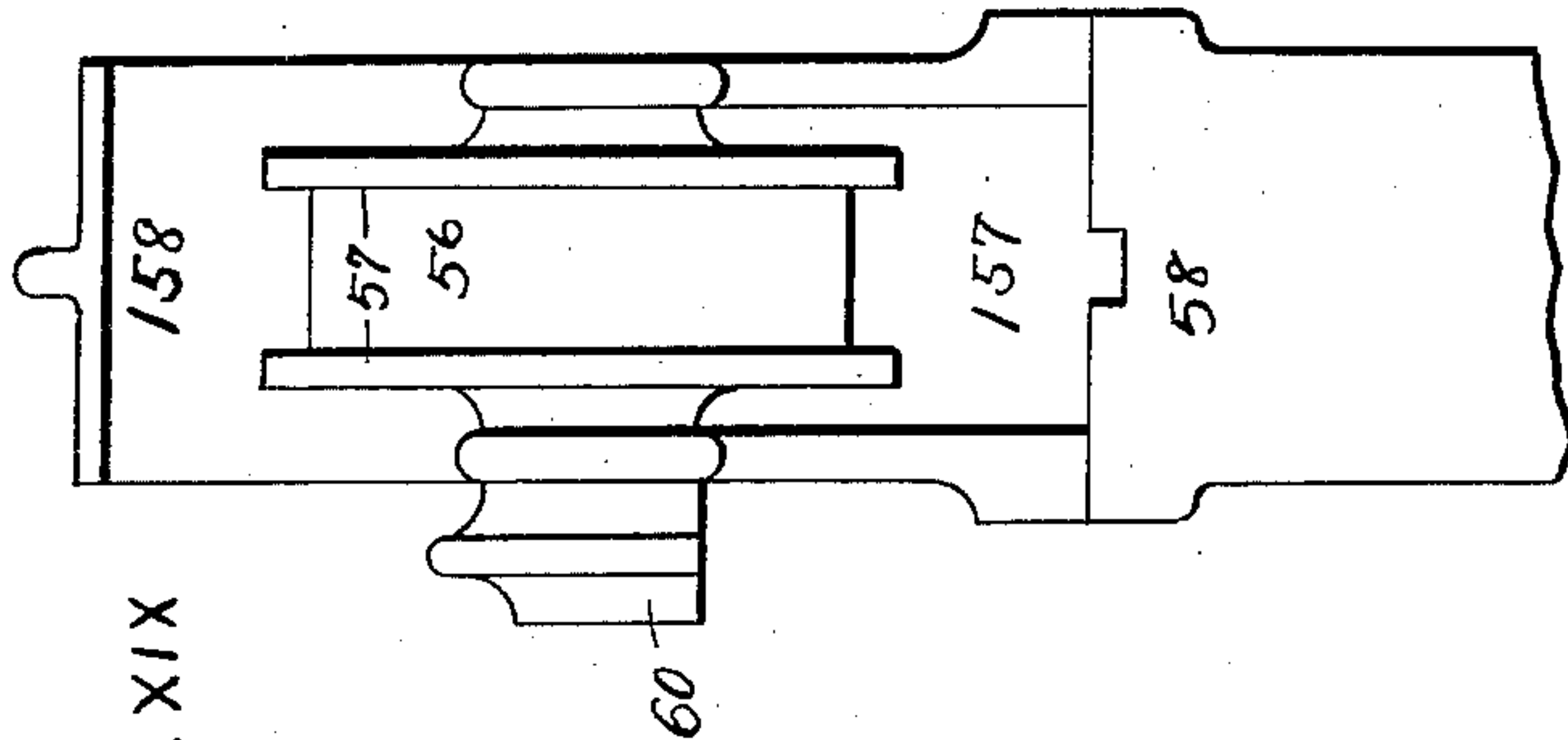


FIG. XIX

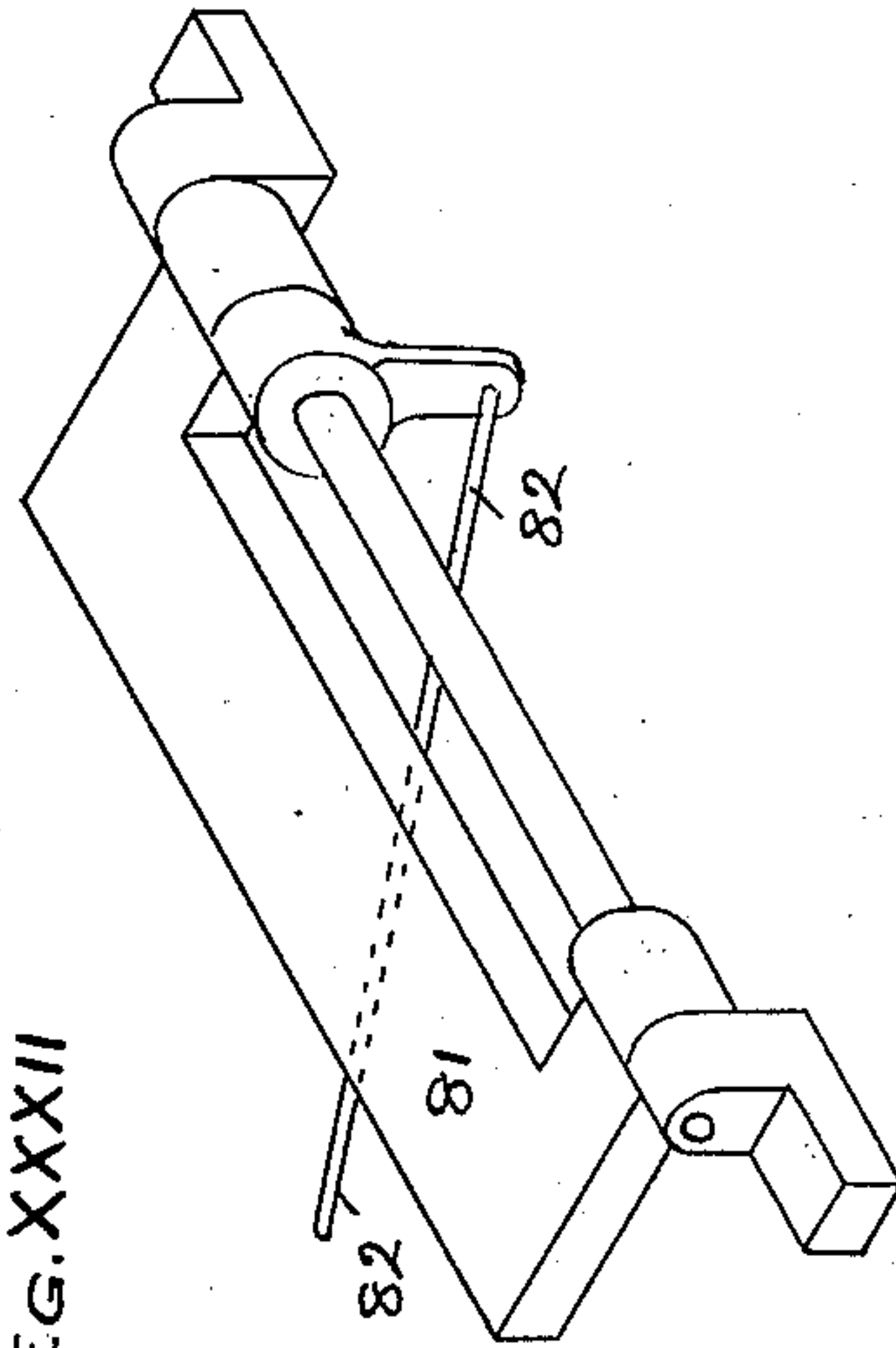


FIG. XXII

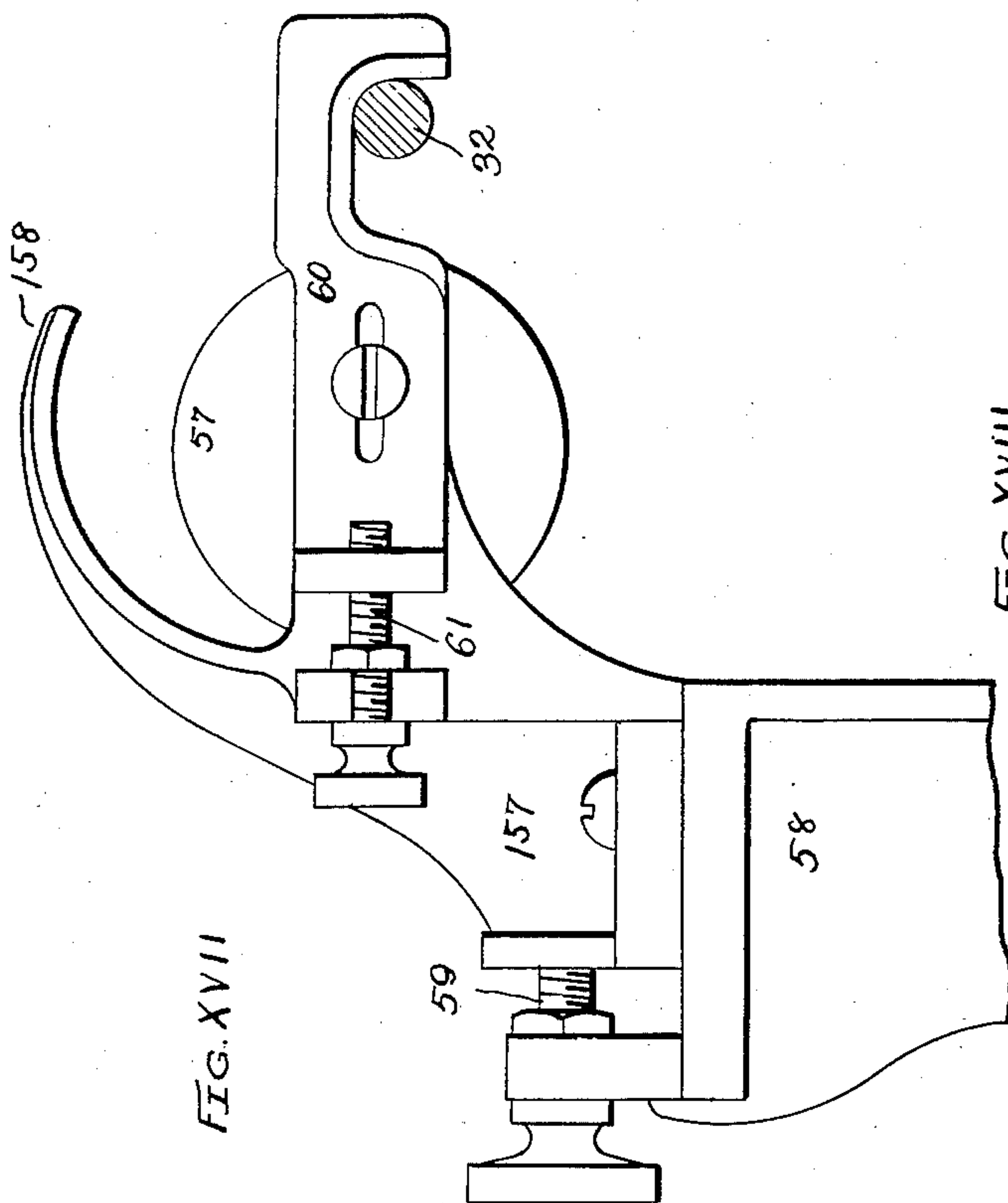
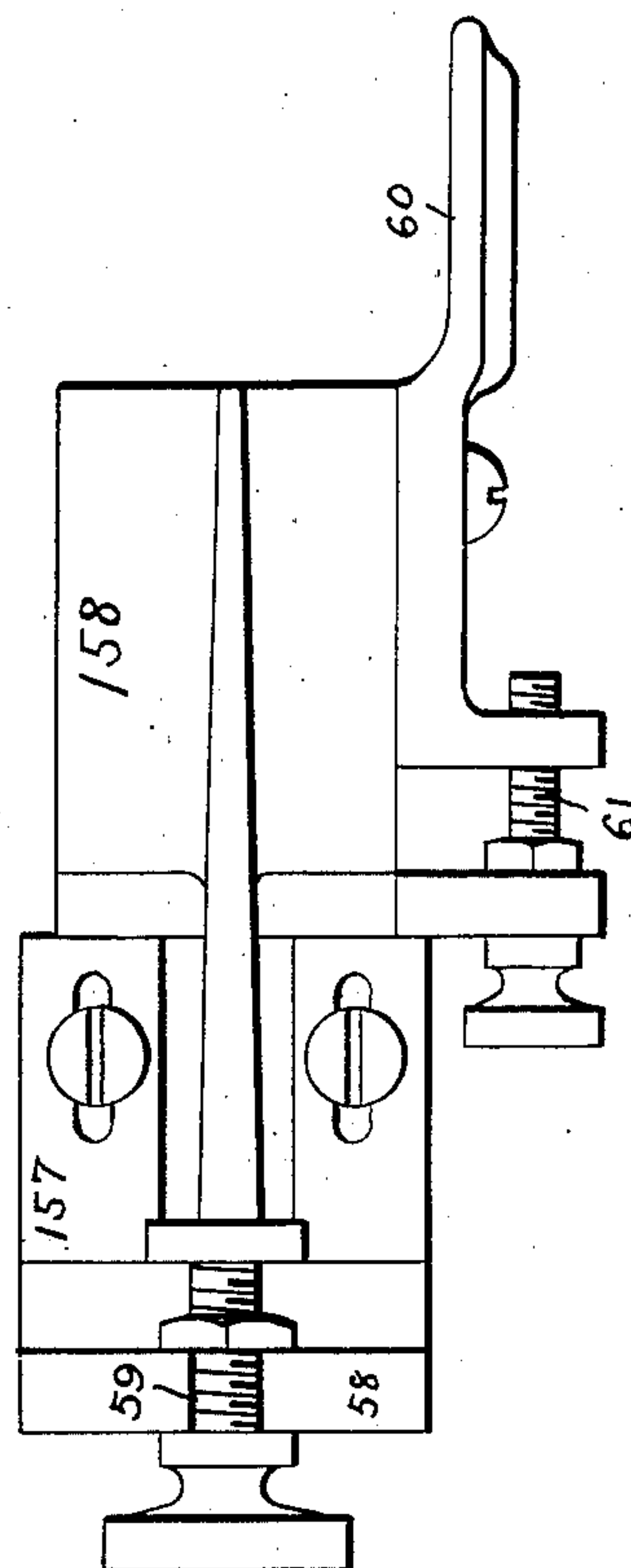


FIG. XVII

FIG. XVIII



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G. GOETZ.
RECORDING CAR SCALE.

(Application filed Mar. 12, 1900.)

(No Model.)

14 Sheets—Sheet 10.

FIG. XX

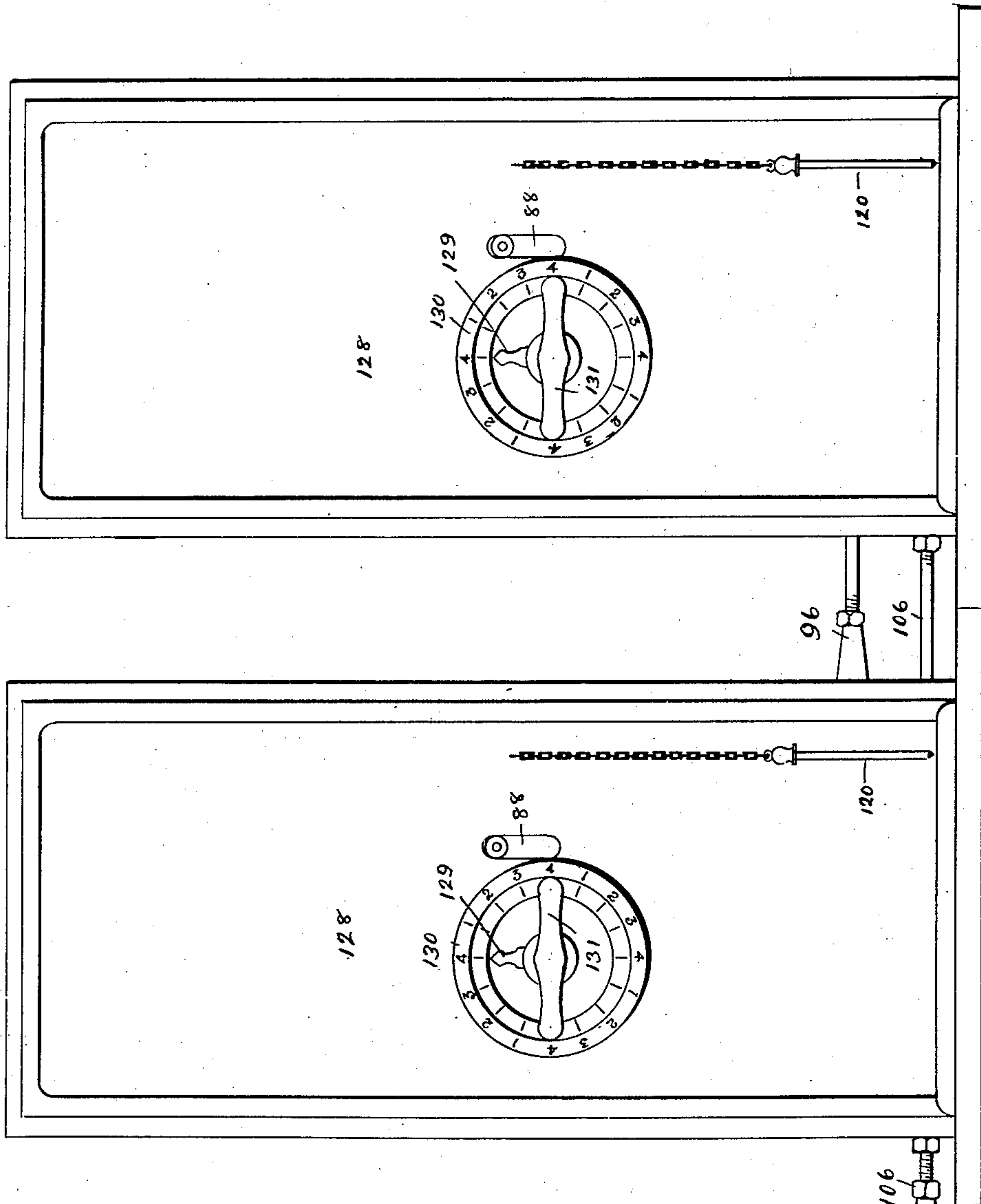
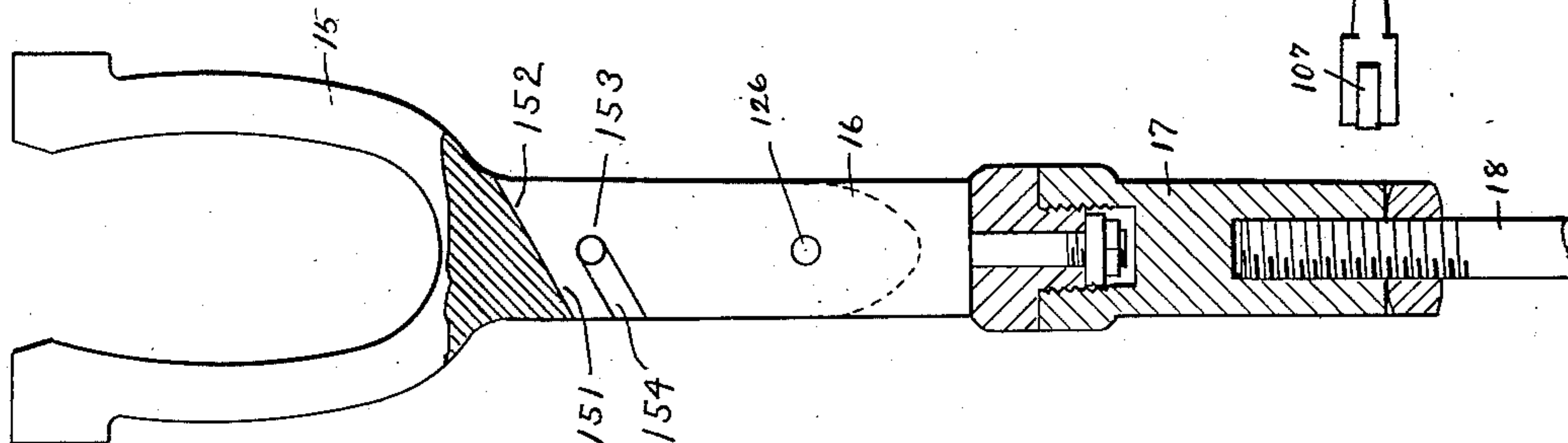


FIG. XXXI



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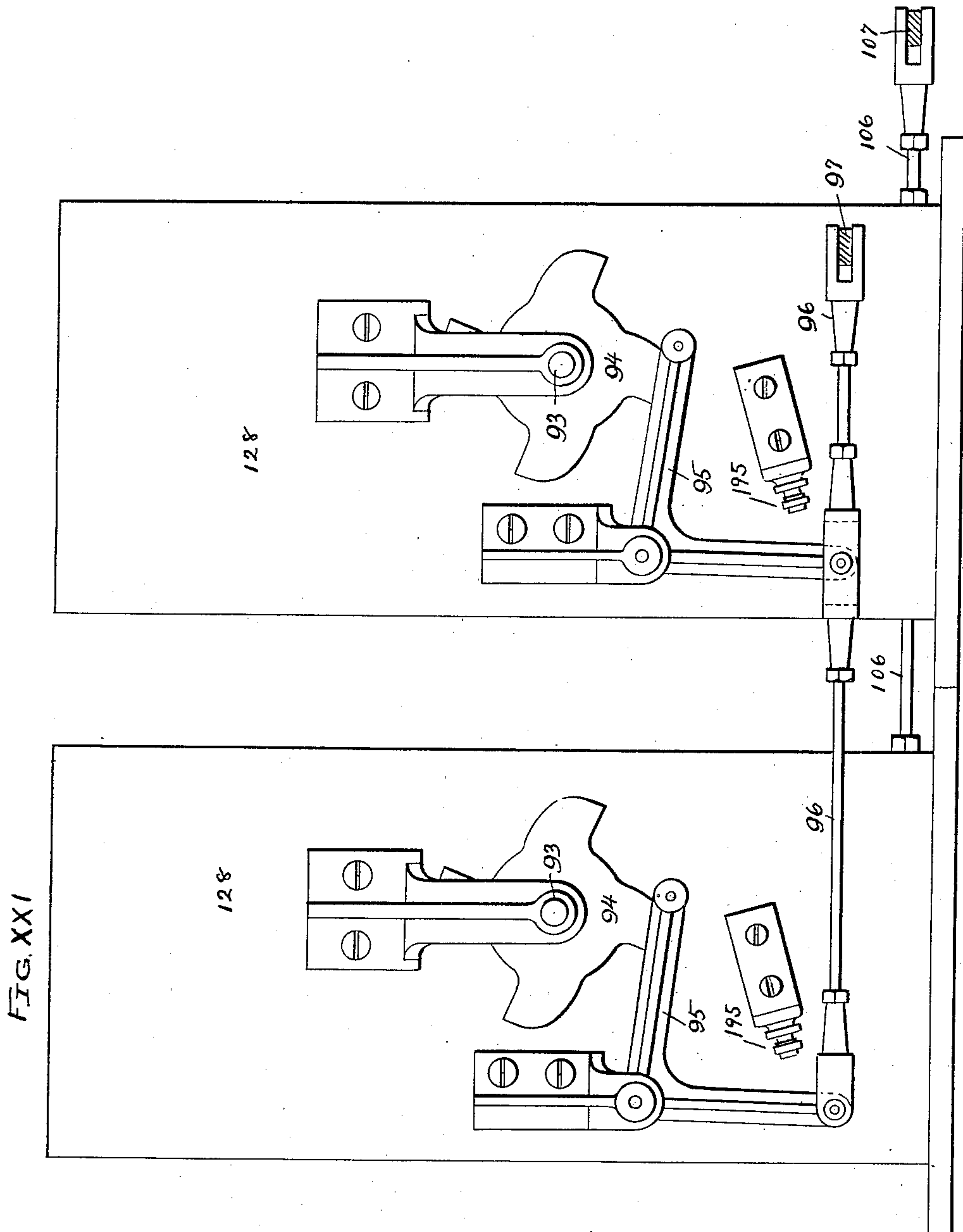
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RECORDING CAR SCALE.

(Application filed Mar. 12, 1900.)

(No Model.)

14 Sheets—Sheet II.



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Patented June 19, 1900.

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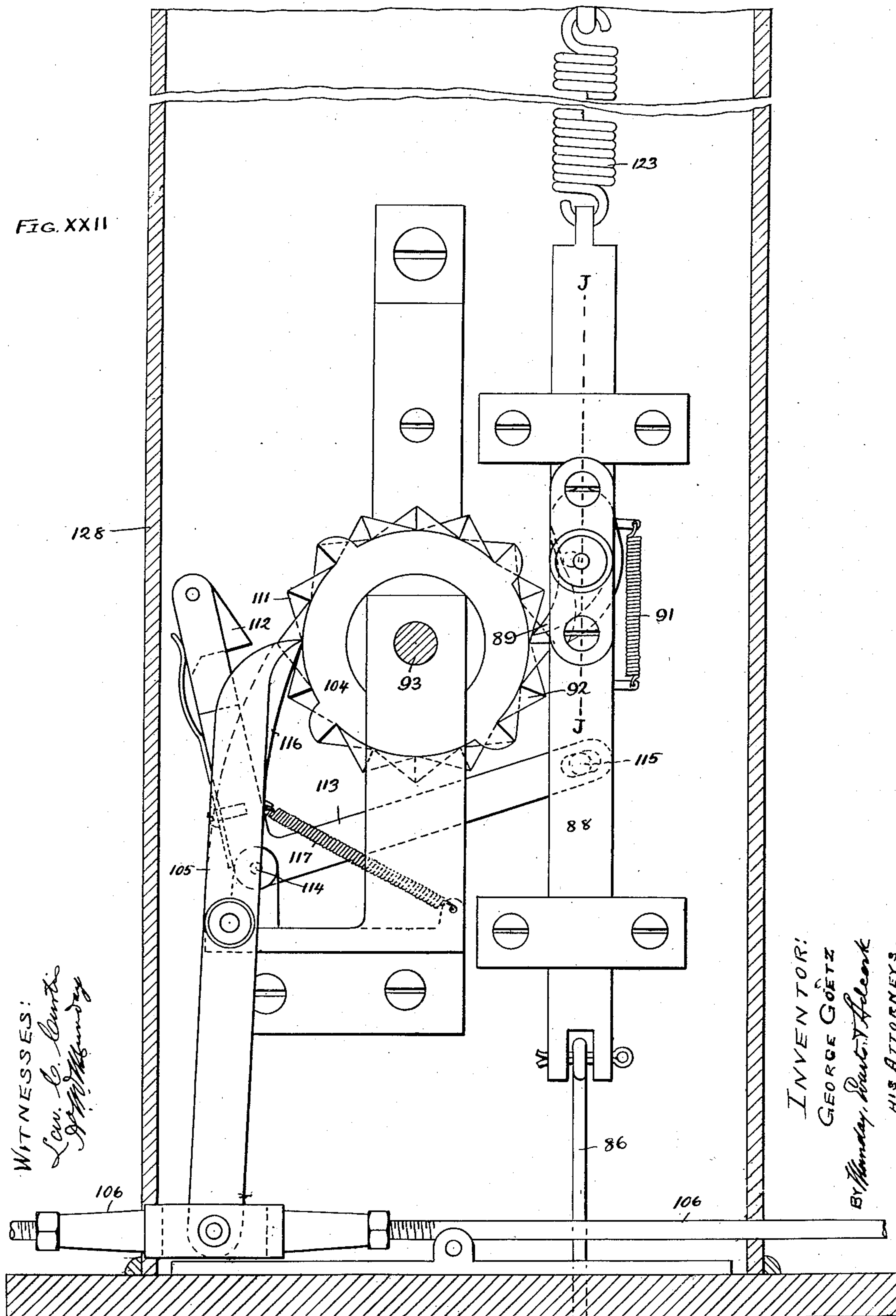
RECORDING CAR SCALE.

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(No Model.)

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FIG. XXII



No. 651,845.

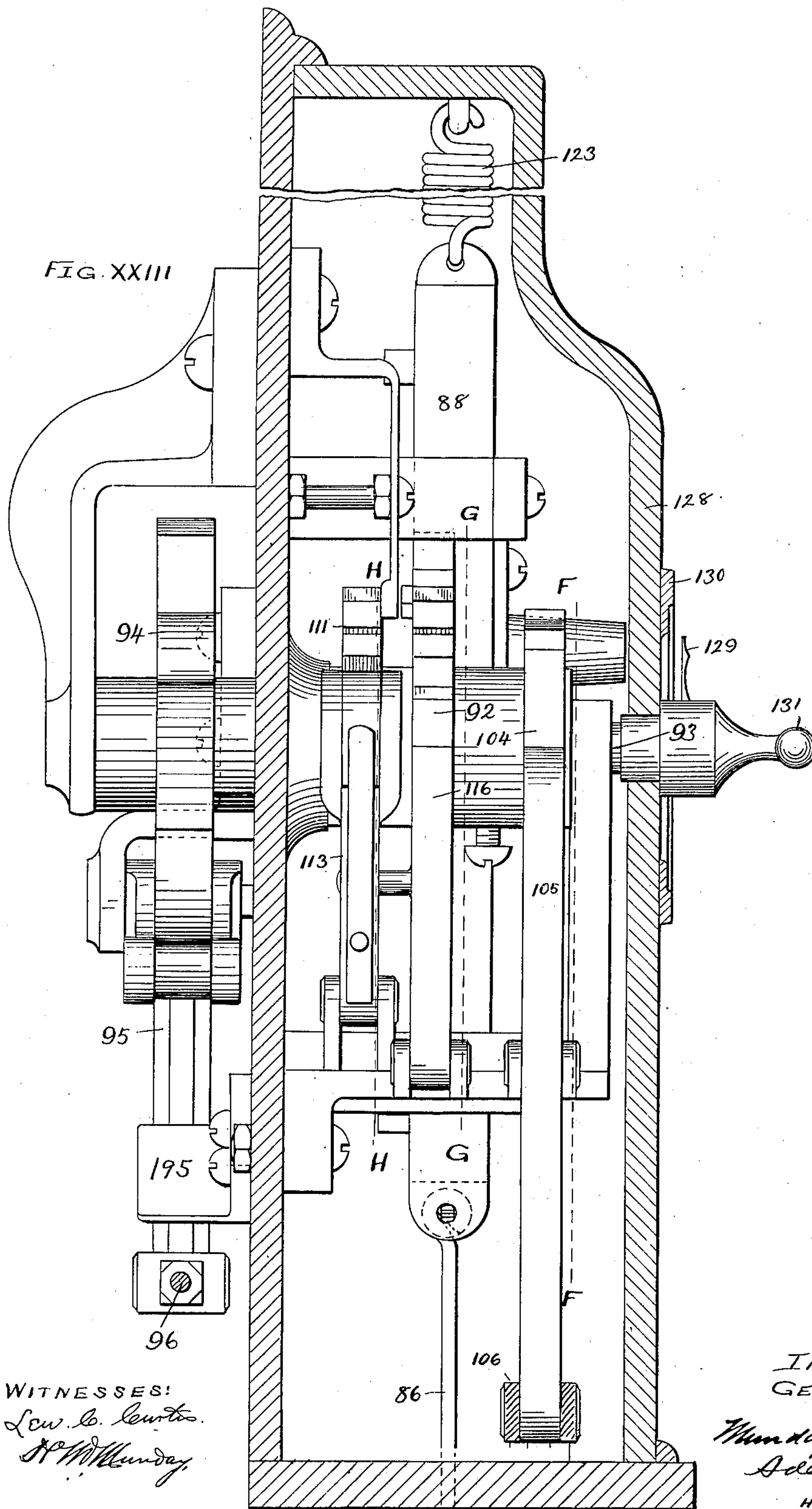
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(Application filed Mar. 12, 1900.)

(No Model.)

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(Application filed Mar. 12, 1900.)

(No Model.)

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FIG. XXV

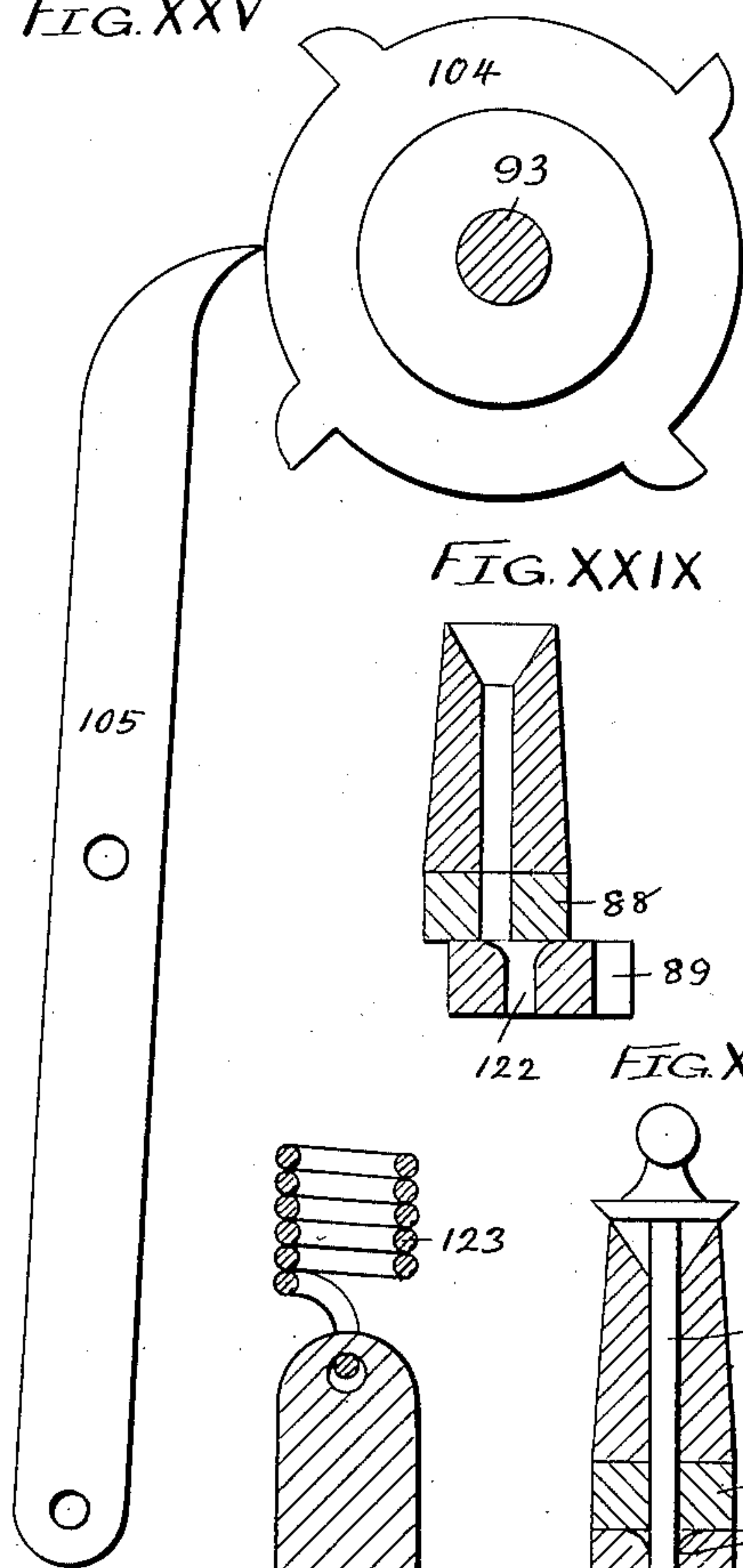


FIG. XXIX

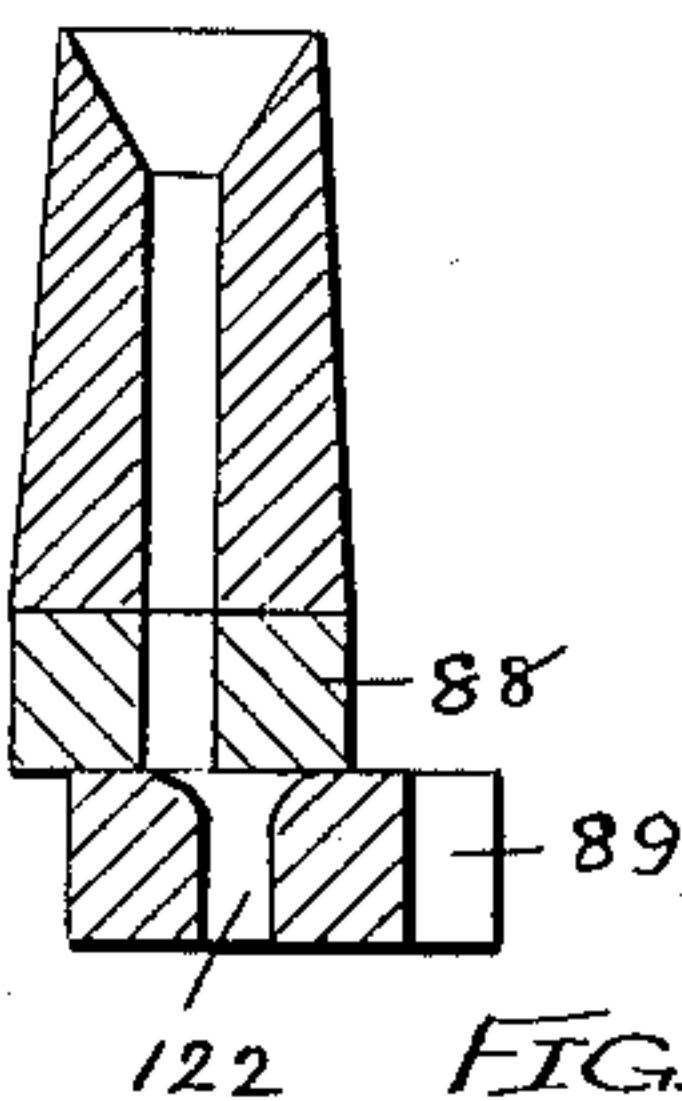


FIG. XXX

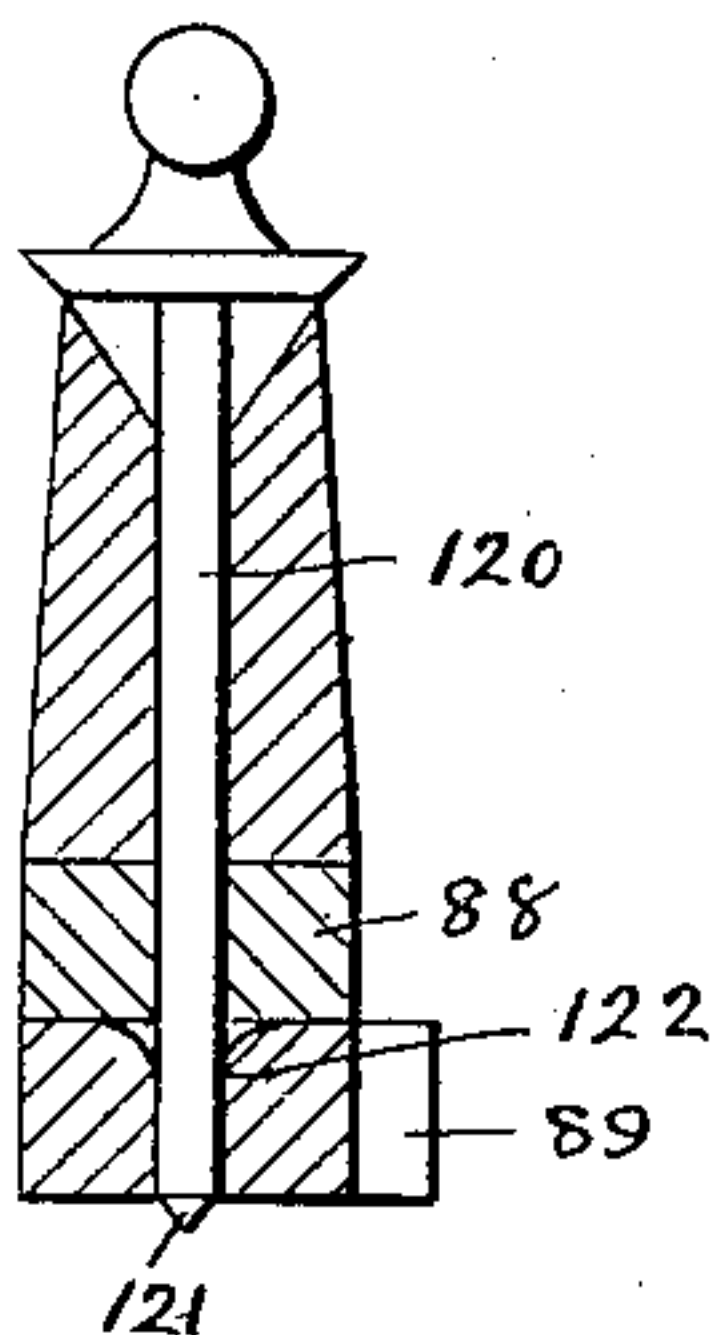


FIG. XXVI

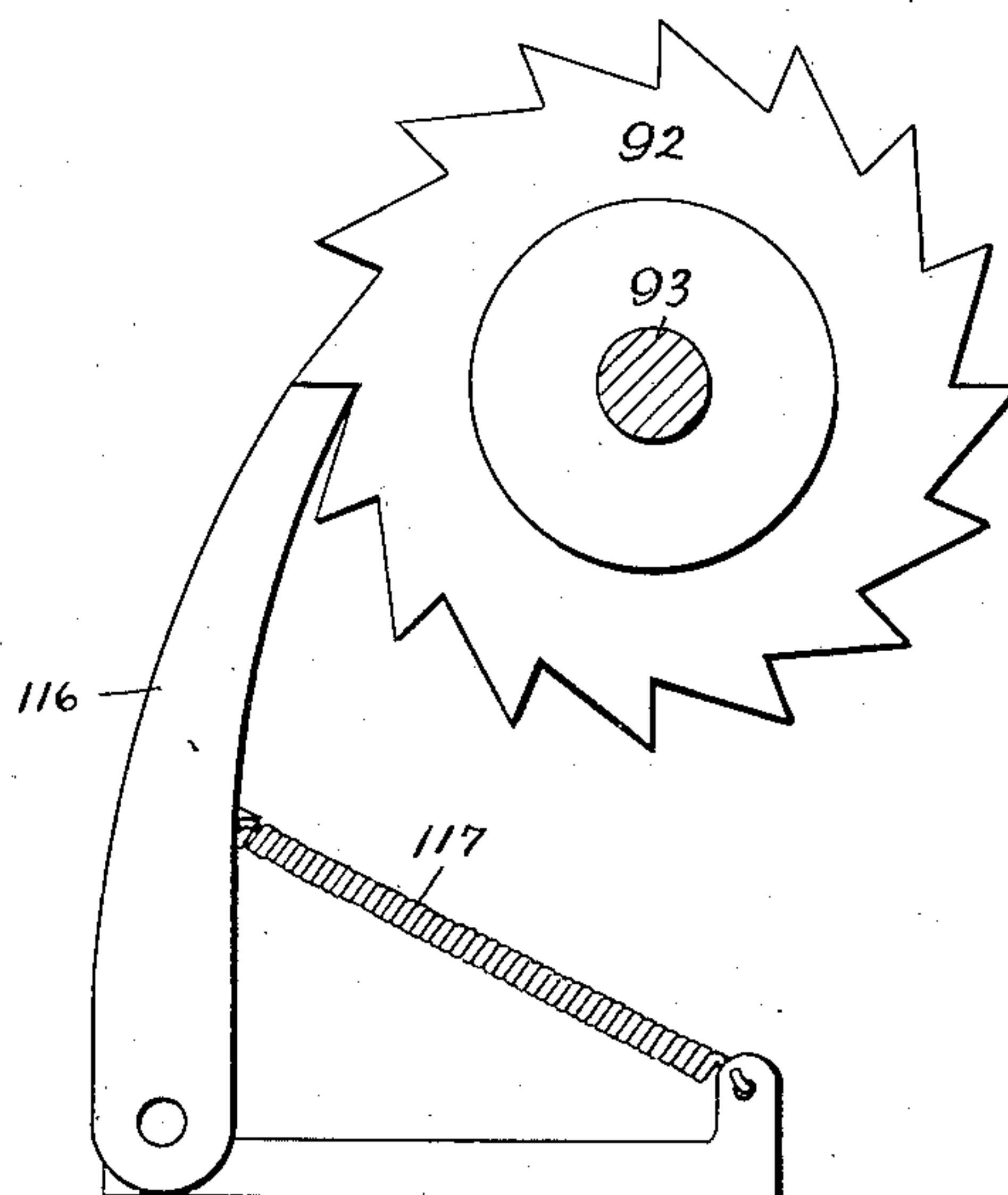


FIG. XXVII

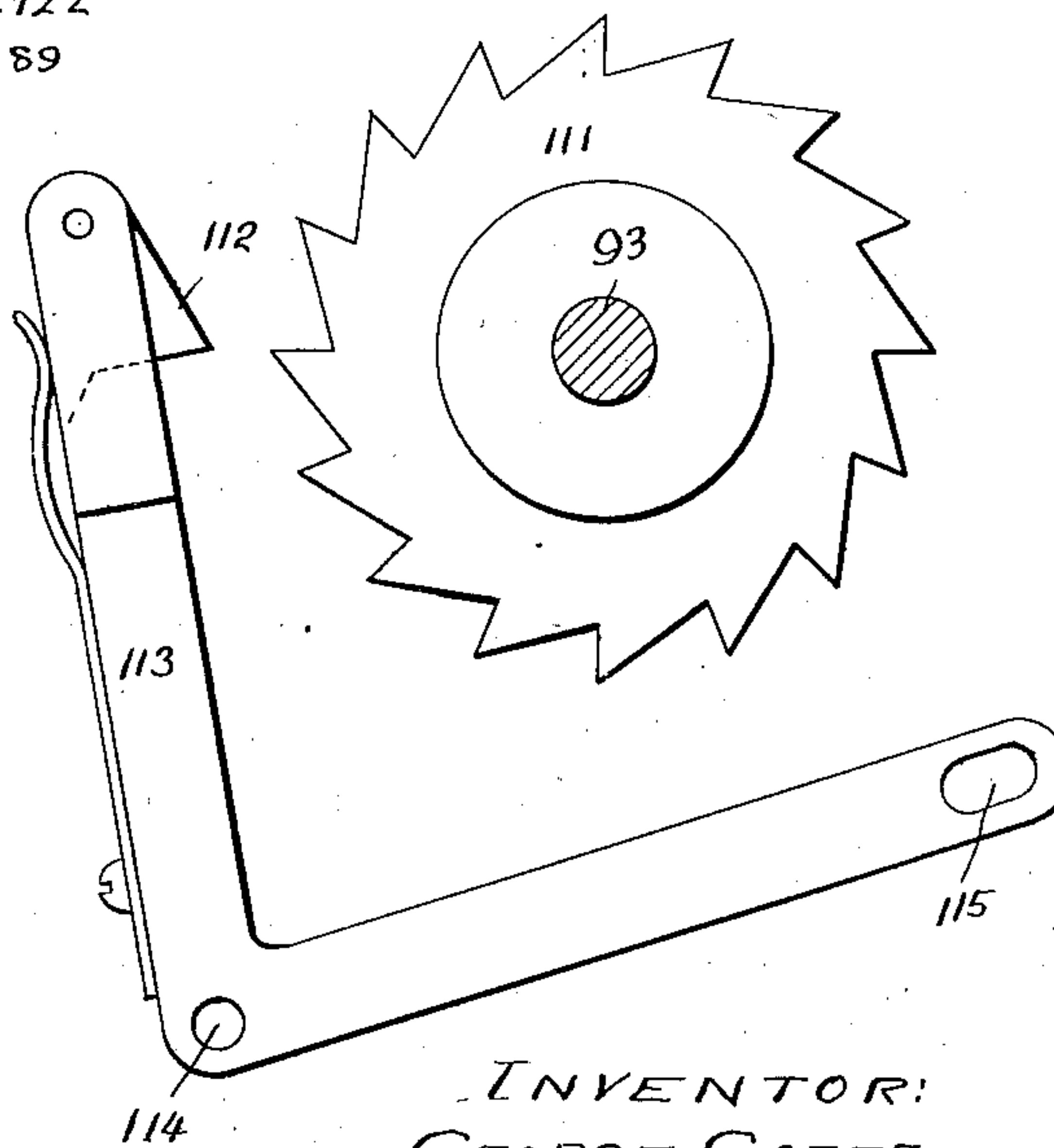
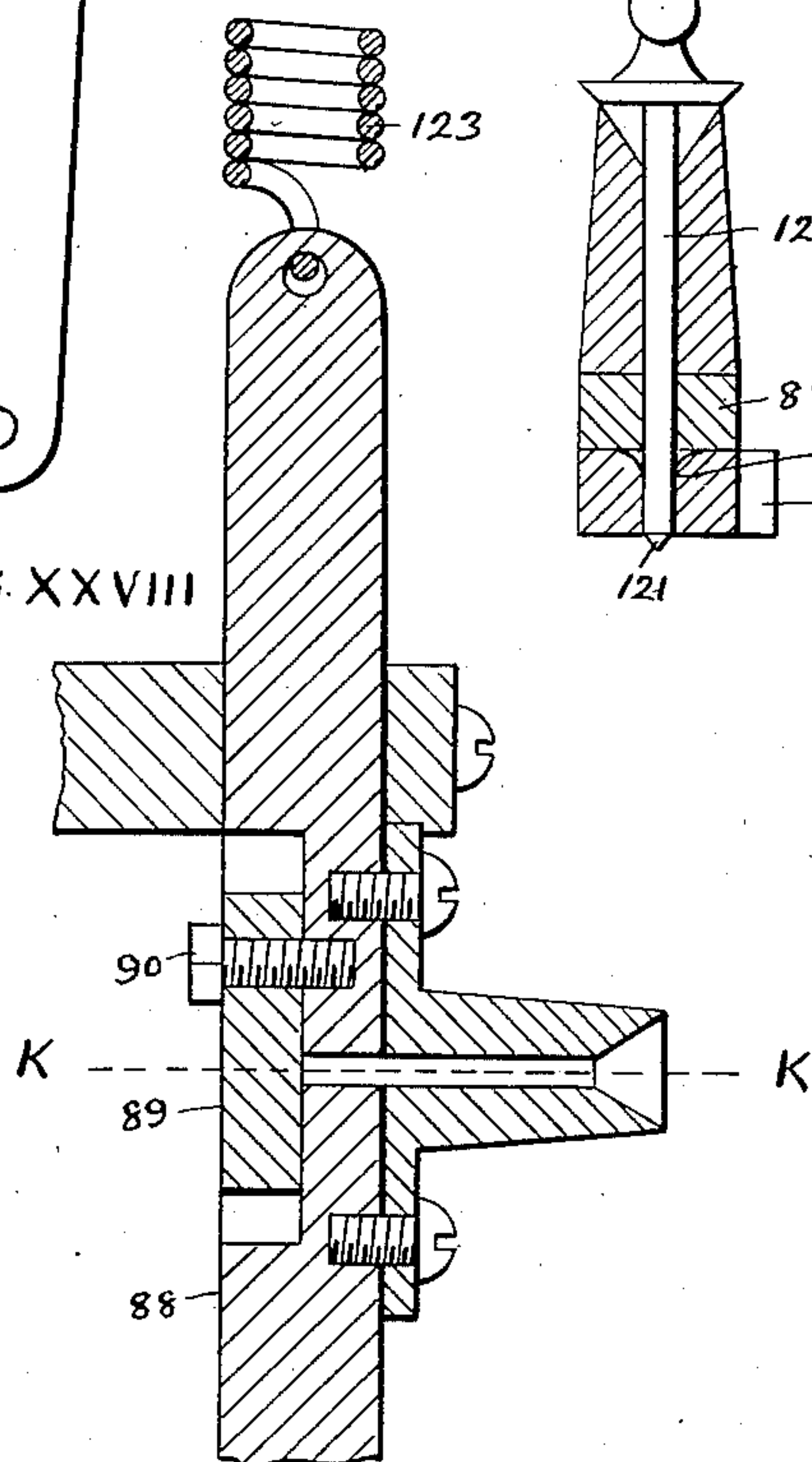


FIG. XXVIII



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INVENTOR:
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By Munday, Curtis & Adams
HIS ATTORNEYS

UNITED STATES PATENT OFFICE.

GEORGE GOETZ, OF CHICAGO, ILLINOIS, ASSIGNOR TO THE STREETER-AMET
WEIGHING AND RECORDING COMPANY, OF SAME PLACE.

RECORDING CAR-SCALE.

SPECIFICATION forming part of Letters Patent No. 651,845, dated June 19, 1900.

Application filed March 12, 1900. Serial No. 8,367. (No model.)

To all whom it may concern:

Be it known that I, GEORGE GOETZ, a citizen of the United States, residing in Chicago, in the county of Cook and State of Illinois, have invented a new and useful Improvement in Scales for Weighing Railway-Cars and Recording the Weights Thereof, of which the following is a specification.

My invention relates to scales for automatically weighing railway-cars and recording or printing the weights thereof as a train of cars passes over the scale-platform.

The object of my invention is to provide an automatic scale of a simple, efficient, and durable construction by means of which the several cars coupled in a train may be automatically weighed and the weight of each car automatically recorded without stopping the train, the operation of weighing and recording the weight of each car being done as the train is drawn over the scale-platform at a reasonable speed.

My invention consists in the novel construction of parts and devices and in the novel combinations of parts and devices herein shown and described, and specified in the claims.

In the accompanying drawings, forming a part of this specification, and in which similar figures of reference indicate like parts throughout said drawings, Figure I is a side elevation of an apparatus embodying my invention. Fig. II is an enlarged detail view, partly in vertical section, of the extension of the scale-beam and dash-pot connected therewith. Figs. III and IV are a detail plan and an elevation, respectively, of the dash-pot plunger. Fig. V is a plan view of the weight-printing mechanism. Fig. VI is a detail showing a portion of the type-wheel and the pointer for indicating the weight. Fig. VII is a portion of the paper strip or tape, showing the manner in which the weight is recorded. Fig. VIII is a section of the pointer, taken on line A A of Fig. VI. Fig. IX is a vertical section on line B B of Fig. V, showing details of the printing mechanism. Fig. X is a section on line B B of Fig. V, showing the parts below that shown in Fig. IX. Fig. XI is a section on line D D of Fig. V, showing details of the printing mechanism. Fig.

XII is a section on line E E of Fig. X. Fig. XIII is a sectional elevation of the spring-motor for winding up the tape or paper strip. Fig. XIV is a detail elevation of the adjustable spring connected to the type-wheel-operating rack. Fig. XV is a detail perspective view of the block for increasing or diminishing the tension on the spring. Fig. XVI is a perspective view of the bolt for attaching the spring-adjusting block. Figs. XVII, XVIII, and XIX are respectively detail views, in side elevation, plan, and front view, of the adjustable antifriction guide or bearing for the type-wheel-operating rack. Fig. XX is a front elevation of the device for indicating the position of the car in respect to the scale-platform. Fig. XXI is a rear elevation of the same. Figs. XXII and XXIII are respectively front and side elevations of said indicating device. Fig. XXIV is a diagram view showing the connections between the car-position-indicator mechanism and the trip device of the weight-printing mechanism. Figs. XXV, XXVI, and XXVII are detail sectional views on lines F F, G G, and H H, respectively, of Fig. XXIII. Fig. XXVIII is a detail section on line J J of Fig. XXII. Fig. XXIX is a detail section on line K K of Fig. XXVIII. Fig. XXX is a view similar to Fig. XXIX, showing the parts in different positions; and Fig. XXXI is a detail section on line L L of Fig. II. Fig. XXXII is a detail view of one of the track-levers.

In said drawings, 2 is the platform of a car-scale, having railway-track rails 3 thereon, which connect with the rails 4 of the railway-track. The car-scale is or may be of any suitable construction commonly in use and having the customary scale-levers below the platform.

5 is the link or connection between the scale-platform or its levers and the scale-beam 6, which is furnished with the customary weights and counterbalances 7.

In order to adapt my apparatus to be readily and conveniently applied to any ordinary railway-scale, I provide a scale-beam extension or arm 8, having a curved socket 9, adapted to be clamped by bolts 10 to the customary curved head 11 of the scale-beam, and it is to this arm or extension that the other parts of

the apparatus are connected instead of directly to the scale-beam.

The counterpoises or weights 7 are used simply for balancing the scale and not for the purpose of indicating the weight by sliding to different positions on the scale-beam, as in ordinary hand-weighing. In my scale the weight of the car is counterpoised by a spring-balance 12, connected at one end to a bracket 13, attached to the frame 14 of the scale, and connected at the other end to the scale-beam extension or arm 8 through the clevis 15, link 16, threaded coupling 17, connecting-rod 18, rack 19, screw-threaded connecting-rod 20, screw-threaded coupling 21, and link 22. The spring-balance 12 is adjustably connected to the support 13 by a rotatable block 23, having a flange 24, adapted to fit between the coils of the spring, and an eye 25, through which the spring-coils may pass, and which block is adapted to turn upon a screw-threaded bolt 26, by which said adjusting-block is secured to the support 13. A set-screw 27 by clamping against the coil of the spring which passes through the eye 25 fixes the adjusting-block securely in any position to which it may be turned. By turning the adjusting-block the active or operative length of the coil-spring 12 may be varied and the tension of the spring thus accurately adjusted as may be required to cause the movement of the scale-beam and rack 19, connected thereto, to correspond accurately to the graduated weights or figures upon the printing-wheel 30, which is connected with and actuated by the scale-beam through said rack 19. The printing or type wheel 30 is furnished on its periphery with a series of type or figures 31, indicating successive weights, the intervals between successive figures being preferably one hundred pounds, as cars are ordinarily not attempted to be balanced or weighed closer than to hundreds of pounds. In Fig. VI a short segment of the periphery of the type-wheel is shown with successive figures or type thereon.

The shaft 32 of the type-wheel 30 is furnished with a gear 33, which meshes with the rack 19, so that the movement of the scale-beam and rack 19, as governed by the spring-balance 12, according to the particular weight of the car on the scale-platform, will turn the type-wheel the extent necessary to bring the figure on the type-wheel corresponding to the weight of the car adjacent to the pointer or indicator type or blade 34, which is mounted on the stationary frame adjacent to the type-wheel. The pointer 34 is adjustably mounted on the stationary frame by means of adjusting-screws 35 and 36, so that the edge or surface of the pointer may be brought into accurate and proper adjustment with the surface of the type on the type-wheel, and thus cause an impression of both to be simultaneously made on the paper strip or tape 37 by the impression-hammer. The shaft 32 of the type-wheel 30 is journaled on antifriction-wheels

38, the shafts 39 of which are journaled on antifriction-wheels 40 to reduce the friction of the type-wheel shaft to a minimum. Adjusting-screws 41, the lower ends of which, however, should not quite touch the shaft 32, keep said shaft in position above and between the friction-wheels 38, upon which it rests. The type-wheel shaft 32 is furnished with a cord 42, wound thereon and supporting a weight 43, which serves to counterbalance the friction of the rack 19, gear 33, and type-wheel shaft, and thus eliminate any error that might result therefrom.

To cause the scale-beam to move steadily and also to come to a true balance for each car very quickly as the train of cars is drawn over the scale-platform without stopping, I combine with the scale-beam extension or arm 8 a dash-pot cylinder 44, having a movable piston 45, connected by a stem 46 to said arm 8 through the link 47, and provide said piston with four large valves 48 48 and 49 49, two opening upward and two opening downward, each of which valves is furnished with a flat spring 50 for holding the valve more or less closed, according to the pressure of the fluid in the dash-pot against the piston. As these valves are large and four in number, they permit of a comparatively quick and free movement of the piston until the movement of the scale-beam begins to approximate the weight of the car, while at the same time the movement of the scale-beam is steadied and constantly diminished in speed until the true balance of the car is reached.

The impression-hammer 51 is carried by a lever 54, pivoted at 52 to the frame, and it is held in its elevated position by a trigger or pawl 53, which engages the notched rear end of the hammer-lever 54, and spring 55 causes it to descend and strike the necessary blow against the type-wheel 30 and pointer 34 to cause an impression thereof to be made upon the paper strip or tape 37 when the type-wheel is turned to indicate the true weight of the car on the scale-platform.

To hold the rack 19 in proper mesh with the gear 33 on the type-wheel shaft in such way as to produce as little friction as possible between the two, I back or support the vertically-moving rack 19 by means of an antifriction-roller 56, which is furnished with flanges 57 to fit on either side of the rack and which is journaled on an adjustable arm 157, the position of which to or from the rack 19 may be adjusted on its supporting-bracket 58 by an adjusting-screw 59. The adjustable arm 157 is furnished with an adjustable extension 60 to regulate the position in respect to the type-wheel shaft 32, this being done by the adjusting-screw 61. The adjustable arm 157 is provided with a curved hood 158, extending over the roller 56 to protect the same from dust.

The paper strip or tape 37, upon which the weights of the cars of the train are successively printed or recorded as the train passes over

the scale-platform 2, is automatically fed from a reel or spool 62, about which it is wound, and passes over or around the tape-guide rollers 63 64 65 66 to the spool or reel 67, upon which the printed record is wound. The take-up spool 67 is rotated and the tape 37 thus kept under tension by a spring-motor 69, which tends to constantly turn the take-up spool and does so turn it when the notched disk 70 on the shaft 71 of the roller 66 is released or permitted to turn. The notched disk 70 is normally held from rotation by a lever 72, pivoted to the frame at 73 and held normally in engagement with the cam by a spring 74. The lever 72 is at intervals disengaged from the notched disk 70, so as to permit the tape 37 to automatically feed forward the length necessary for receiving the next impression thereon by the impression-hammer lever 54.

The spring-motor 69 may be of any usual or well-known construction. As illustrated in the drawings, it comprises a case or frame 169, a spring 170, shaft 171, gears 172 173, shaft 174, gears 175 176, and shaft 177, said shaft 177 carrying a governor consisting of radial arms 178, attached to said shaft and furnished with sliding weights 179, which engage frictionally a stationary ring 180.

The tape 37 in passing from the guide-roller 64 to the guide-roller 65 passes over the type-wheel 30 and indicator-type 34 and beneath the rotary elastic disk 75, preferably of rubber stiffened with cardboard 76 and bearing on its under face a carbon-surface or carbon-paper 77, so as to cause the type of the type-wheel 30 and indicator 34 to make a distinct impression on the paper strip or tape 34. The carbon-printing disk 75 76 77 has a shaft furnished with a pulley 78, driven by a belt 79 from a pulley 80 on the shaft of the guide-roller 64, so that the printing-disk is given an intermittent rotary movement to bring a new surface over the type after each impression.

To cause the cars of the train as they pass onto and over the scale-platform to automatically raise the impression-hammer into position for operation and to automatically release said impression-hammer when each car is fully onto the scale-platform and before passing off and while the type-wheel is brought to a true balance, so as to indicate the true weight of the car, and before the front wheels of the next succeeding car of the train pass onto the scale-platform, I provide the scale-platform with two long bent or bail-shaped track-levers 81 81, located closely adjacent and parallel to the rails 3 and in the path of the flange of the car-wheel, so that these bent or bail levers will be depressed or actuated by the flanges of the wheels of the car as it passes along. The track-levers 81, one at each end of the scale-platform, preferably extend for about one half their length on the scale-platform and for the other half of their length along the track-rail 4, beyond the

scale-platform. Motion is communicated from the bent or bail levers 81 to raise the impression-hammer by means of a connecting-link 82, bent lever 83, connecting-link 84, bent lever 85, and connecting-link 86, furnished with a compensating spring 87. Said link 86 connects with a sliding bar 88, carrying a pawl 89, pivoted to said bar 88 by a pivot-screw 90, which pawl is held in operative position by a spring 91 to engage a ratchet-wheel 92 on the shaft 93, so that said shaft is turned the distance of one ratchet-tooth for each car-wheel passing over the bent or bail track-lever 81. The shaft 93 thus actuated is provided with a cam 94, secured thereto, said cam being provided with one cam projection for each four teeth on the ratchet-wheel, so that the cam will be operative once to every four movements of the ratchet-wheel. As freight-cars usually have eight wheels—four wheels on a side—the apparatus illustrated in the drawings is designed for use in weighing eight-wheeled cars. The cam 94 at the third movement of the ratchet 92 operates to raise the impression-hammer through the connecting bent lever 95, link 96, lever 97, link 98, lever 99, link 100, and bent lever 101, which has a pin 102 passing underneath the impression-hammer lever 54. When the impression-hammer lever is thus raised into the position shown in Fig. XI by the third movement of the ratchet 92, it is automatically held in this position by the pawl 53, and the fourth step or movement of the ratchet 92 moves the cam 94 out of contact with the bent lever 95 and allows the bent levers 95 and 101 and their connections to return to their normal position in obedience to spring 103, so that the impression-hammer may be free to descend when released by the pawl 53. Stops or buffers 195, secured to the box or case 128, limit the movement of the levers 95 in one direction.

The pawl 53 is automatically moved to release the impression-hammer lever 54 at the fourth movement or step of the ratchet 92 by means of the cam-wheel 104 on the shaft 93 operating a lever 105, connected to a link 106 through lever 107, link 108, and lever 109, which engages a pin 110 on the pawl 53, and thus moves the pawl to release said impression-hammer lever 54.

To prevent overrotation of the ratchet-shaft 93, said shaft is provided with a reverse ratchet 111, which is engaged by a pawl 112, pivoted to the bent lever 113, which is pivoted at 114 to the frame and connected at 115 with the slide 88, so that when the slide 88 operates the ratchet 92 it will, through the bent lever 113, throw the pawl 112 into engagement with the reverse ratchet 111. To prevent any backward movement of the ratchet 93, a pawl 116 is provided and held in engagement with said ratchet 92 by a spring 117.

The track-levers 81 are duplicated or two in number and are located at each end of the scale-platform, as before stated, and the ratchet mechanism above described for raising

and releasing the impression-hammer is likewise duplicated, one set of this mechanism being employed for each of the track-levers 81. As the two duplicate bent levers 95 95 of each of said duplicate ratchet mechanisms are connected together by the link 96, it will be seen that the impression-hammer lever 54 cannot descend until both cams 94 are moved into the position for disengaging the levers 95 95 and consequently permitting the bent lever 101 to withdraw out of the way of said lever 54 and permit its descent. In other words, the impression-hammer cannot descend to print the weight of the car until both ratchets 92 have each been operated four times—that is to say, until the four wheels of one car passing off the scale-platform have each and all operated the track-lever 81 at that end and until the four wheels of the entering car have each and all operated the bent track-lever 81 at the other end of the scale-platform.

In practice freight-cars are frequently of different lengths or of different distances between the truck-wheels, and to adapt the apparatus to operate automatically upon either long or short cars coupled promiscuously in a train, as they usually are, it is necessary to duplicate the long bent track-levers 81 and the ratchet mechanism and to have the bent levers 95 95 of the two ratchet mechanisms connected together, so that neither can operate to permit the withdrawal of the bent lever 101 until both cams 94 94 are turned to the same position by four wheels of one car passing off and four wheels of another car passing onto the scale-platform. The two bent track-levers 81 81 are located far enough apart so that all four wheels of a long car may stand on the scale-platform between them without touching either, and they are at the same time located near enough together so that when a short car is on the scale-platform the front wheel of the next car cannot touch either of said levers. By this means the apparatus is adapted to weigh long or short cars coupled promiscuously in a train, and the printing or weight-recording mechanism is so controlled that it will only be operated when the wheels of one car are alone upon the scale-platform.

Locomotives and their tenders usually have a different number of wheels than the cars, and the same are differently spaced, and to prevent the duplicate ratchet mechanisms from being thrown out of the proper position for counting and being actuated by the four wheels of the car by the passage of an unequal number of wheels on the engine or tender over the scale-platform I provide the operating-pawls 89 of each of the ratchets 92 with a device for temporarily holding said pawls out of gear or operative position in respect to said ratchets while the wheels of a locomotive or tender are passing over the scale-platform. This pawl unengaging or disengaging device preferably consists of a pin

120, having a pointed or inclined end 121, which passes through a hole in the slide 88 and enters a funnel-shaped hole 122 in the pawl 89, and thus forces the pawl out of operative position with the ratchet. The instant all the wheels of the engine and tender pass the lever 81, connected with one ratchet mechanism, and before the first or front wheel of the car engages said lever the pawl-disengaging pin 120 must be removed, and the same is true in relation to the pawl-disengaging pin of the other ratchet mechanism. The pawl-carrying slide 88 after being pulled down by the track-lever 81 is automatically retracted by a spring 123. The track-levers 81 are each automatically returned to a normal position after being operated upon by one wheel, so as to be ready to be again operated upon by the next wheel by means of a spring 124, connected to the bent lever 85 by links 125. The spring 87 compensates for any excess of movement of the track-lever 81 over that of the sliding bar 88.

The link 16 affords a swivel connection between the clevis 15 and the coupling 17 to prevent any binding or twisting action on the rack 19 and consequent undue friction. The clevis 15 is connected to the swivel-link 16 by a movable pin 126, held in place by a retaining-spring 127, so that the scale-beam may be disconnected from the type-wheel and its operating-rack in case it is desired to weigh a car by hand for the purpose of testing the accuracy of the scale and weight-recording mechanism whenever desired or for other purposes. The part or clevis 15 has a slot 150, provided with a beveled end 151, against which the beveled end 152 of the link 16 fits, and the clevis 15 is also provided with a fixed pin 153, fitting in an inclined slot 154 in the link 16, so that when the pin 126 is inserted a rigid connection will be formed between the clevis 15 and link 16 and also forming a connection by which the parts are readily separated by the removal of one pin.

The ratchet-shaft 93 is provided on the outside of the inclosing case 128 of the ratchet mechanism with a pointer or finger 129, which indicates on a dial 130 the position of the wheels of the car in respect to such platform and the position of the ratchet-wheel and cam. By comparing the two pointers 129 of the two ratchet mechanisms a glance will show if the two ratchet mechanisms are in proper registry with each other. The ratchet-shaft 93 is also provided with a handle 131 for turning it by hand to adjust the ratchet mechanism. This is a convenience in setting the two ratchet mechanisms in proper registry with each other.

The spool or reel 62 is provided with a tension-roller 132, journaled on a sliding weight 133, adapted to move up and down on the guide-pins 134.

135 indicates the four wheels of a car on the scale-platform.

I claim--

1. The combination in an automatic car-scale-weighing and weight-recording apparatus, of a scale-platform with track-levers at each end thereof adapted to be operated by the wheels of a car, with a scale-beam furnished with an extension or arm, a dash-pot cylinder furnished with a piston connected with said arm and having two upwardly-opening and two downwardly-opening valves, a rotary type-wheel, a spring having a tension-adjusting block, a rack connecting said scale-beam with the spring, a gear on the type-wheel shaft meshing with said rack, a pointer-type adjacent to said type-wheel, an impression-hammer, an impression-hammer lever, a pawl or trigger for holding the impression-hammer lever in its elevated position, a spring for actuating the impression-hammer, a paper-strip reel, take-up reel and guide-rollers, a spring-motor for actuating the take-up reel, a notched disk and actuating-lever for controlling the forward feed of the paper strip or tape, an elastic printing-disk interposed between the type wheel and pointer-type and the impression-hammer, two pawl-carrying slides, one connected with and actuated by each of said track-levers, two ratchets actuated one by each of said pawl-carrying slides and furnished each with a cam and connecting-lever adapted to raise the impression-hammer lever at the third impulse or movement of either of said ratchets, and to disengage itself from said lever on the fourth impulse thereof, said levers being connected together so that the mechanism for raising the impression-hammer lever cannot be withdrawn to permit the descent of said impression-hammer lever until both of said ratchets have been given its fourth impulse or movement, the shaft of each of said ratchets being furnished with a further cam and connecting levers and links for moving said trigger or pawl to release the impression-hammer lever, substantially as specified.

2. In an automatic weight-recording scale, the combination with the scale-beam of a type-wheel connected thereto and operated thereby, and a spring connected with said scale-beam and type-wheel and furnished with a tension-adjusting block having a flange adapted to fit between the coils of said spring, and an eye through which the spring extends as the adjusting-block is turned, substantially as specified.

3. In an automatic weight-recording scale, the combination with the scale-beam of a type-wheel connected thereto and operated thereby, and a spring connected with said scale-beam and type-wheel and furnished with a tension-adjusting block having a flange adapted to fit between the coils of said spring, an eye through which the spring extends as the adjusting-block is turned and a set-screw for fixing the adjusting-block in position, substantially as specified.

4. The combination with the scale-beam

and type-wheel connected therewith, of a dash-pot cylinder 44, having piston 45 furnished with two large upwardly-opening and two large downwardly-opening valves 46, each having a flat spring 47, substantially as specified.

5. In an automatic weight-recording car-scale, the combination with the scale-platform, scale-beam, type-wheel, spring, impression-hammer lever 54 and a movable trigger or pawl 53 for holding said lever 54 in its elevated position, of a pair of track-levers 81, 81, one at each end of the scale-platform, a pawl, ratchet and pawl-carrying slide for and connected with each of said track-levers 81, the shaft of each of said ratchets having a cam and an operating-lever 95 adapted to raise said impression-hammer lever, said operating-levers being connected together, so that the impression-hammer-lever-raising mechanism cannot be withdrawn out of the way of the descent thereof until both of said ratchets receive the same number of impulses through its respective track-lever 81, substantially as specified.

6. In an automatic weight-recording car-scale, the combination with the scale-platform, scale-beam, type-wheel, spring, impression-hammer lever 54 and a movable trigger or pawl 53 for holding said lever 54 in its elevated position, of a pair of track-levers 81, 81, one at each end of the scale-platform, a pawl, ratchet and pawl-carrying slide for and connected with each of said track-levers 81, 81, the shaft of each of said ratchets having a cam and an operating-lever 95 adapted to raise said impression-hammer lever, said operating-levers being connected together, so that the impression-hammer-lever-raising mechanism cannot be withdrawn out of the way of the descent thereof until both of said ratchets receive the same number of impulses through its respective track-lever 81, and connecting links and levers from said levers 95 for operating said impression-hammer lever 54, substantially as specified.

7. In an automatic weight-recording car-scale, the combination with the scale-platform, scale-beam, type-wheel, spring, impression-hammer lever 54 and a movable trigger or pawl 53 for holding said lever 54 in its elevated position, of a pair of track-levers 81, 81, one at each end of the scale-platform, a pawl, ratchet and pawl-carrying slide for and connected with each of said track-levers 81, the shaft of each of said ratchets having a cam and an operating-lever 95 adapted to raise said impression-hammer lever, said operating-levers being connected together, so that the impression-hammer-lever-raising mechanism cannot be withdrawn out of the way of the descent thereof until both of said ratchets receive the same number of impulses through its respective track-lever 81, the shafts of said ratchets having each a further cam 104 and connecting links and levers for withdrawing said trigger or pawl 53 from engagement

with said hammer-lever 54, substantially as specified.

8. In an automatic weight-recording car-scale, the combination with the scale-platform, scale-beam, type-wheel, spring, impression-hammer lever 54 and a movable trigger or pawl 53 for holding said lever 54 in its elevated position, of a pair of track-levers 81, 81, one at each end of the scale-platform, a pawl, ratchet and pawl-carrying slide for and connected with each of said track-levers 81, 81, the shafts of each of said ratchets having a cam and an operating-lever 95, adapted to raise said impression-hammer lever, said operating-levers being connected together, so that the impression-hammer-lever-raising mechanism cannot be withdrawn out of the way of the descent thereof until both of said ratchets receive the same number of impulses through its respective track-lever 81, and connecting links and levers from said levers 95 for operating said impression-hammer lever 54, the shafts of said ratchets having each a further cam 104, and connecting links and levers for withdrawing said trigger or pawl 53 from engagement with said hammer-lever 54, substantially as specified.

9. In an automatic weight-recording car-scale, the combination with the scale-platform, scale-beam, type-wheel, spring, impression-hammer lever 54 and movable trigger or pawl 53 for holding said lever 54 in its elevated position, of a pair of track-levers 81, 81, one at each end of the scale-platform, a pawl, ratchet and pawl-carrying slide for and connected with each of said track-levers 81, the shaft of each of said ratchets having a cam and an operating-lever 95 adapted to raise said impression-hammer lever, said operating-levers being connected together, so that the impression-hammer-lever-raising mechanism cannot be withdrawn out of the way of the descent thereof until both of said ratchets receive the same number of impulses through its respective track-lever 81, each of said pawl-carrying slides being provided with a device for temporarily holding its pawl out of operative position in respect to its ratchet to enable an engine or tender having a dissimilar number of wheels from a car to pass over the scale-platform without getting said ratchets out of registry, substantially as specified.

10. In an automatic weight-recording car-scale, the combination with a scale-platform and track-levers at each end thereof, of a scale-beam and type-wheel connected therewith, an impression-hammer lever, a pair of pawls and pawl-carrying slides 88 connected one with each of said track-levers, a pair of ratchets operated thereby, and cams and connecting mechanism for raising the impression-hammer lever by impulses imparted to said ratchets by said track-levers, substantially as specified.

11. In an automatic weight-recording car-

scale, the combination with a scale-platform and track-levers at each end thereof, of a scale-beam and type-wheel connected therewith, an impression-hammer lever, a pair of pawls and pawl-carrying slides 88 connected one with each of said track-levers, a pair of ratchets operated thereby and having each two cams one for actuating mechanism to raise the impression-hammer lever and the other for actuating mechanism for releasing said lever, substantially as specified.

12. In an automatic weight-recording car-scale, the combination with a scale-platform and track-levers at each end thereof, of a scale-beam and type-wheel connected therewith, an impression-hammer lever, a pair of pawls and pawl-carrying slides 88 connected one with each of said track-levers, a pair of ratchets operated thereby, the shaft 93 of each of said ratchets having a cam 94, bent levers 95 operated by said cams, link 96 connecting said levers 95, 95, and connecting levers and links, and bent lever 101 for raising the impression-hammer lever 54, substantially as specified.

13. In an automatic weight-recording car-scale, the combination with a scale-platform and track-levers at each end thereof, of a scale-beam and type-wheel connected therewith, an impression-hammer lever, a pair of pawls and pawl-carrying slides 88 connected one with each of said track-levers, a pair of ratchets operated thereby, the shaft 93 of each of said ratchets having a cam 94, bent levers 95 operated by said cams, link 96 connecting said levers 95, 95, and connecting levers and links, bent lever 101 for raising the impression-hammer lever 54, and each of said ratchet-shafts 93 having a further cam 101, lever 105, a connecting-link 106, lever 107, link 108, lever 109 engaging trigger or pawl 53 to release said hammer-lever 54, substantially as specified.

14. In an automatic weighing and recording car-scale, the combination with the scale-beam and spring, of a type-wheel having a shaft furnished with a gear, a sliding rack 19 meshing with said gear, connecting-rod 18, coupling 17, swivel 16 and clevis 15 connecting said rack with said scale-beam, substantially as specified.

15. In an automatic weighing and recording car-scale, the combination with the scale-beam and spring, of a type-wheel having a shaft furnished with a gear, a sliding rack 19 meshing with said gear, connecting-rod 18, coupling 17, swivel 16 and clevis 15 connecting said rack with said scale-beam, connecting-rod 20, coupling 21 and link 22 connecting said rack with said spring, substantially as specified.

16. In an automatic weighing and recording car-scale, the combination with the scale-platform, of two track-levers 81, 81, of two pawl-carrying slides 88, 88, connected one with each of said track-levers, two ratchets 92, 92, having each a shaft 93, furnished with

cams 94 and 104, bent levers 95, 95, operated by said cams 94 and a connecting-rod 96, substantially as specified.

5 17. In an automatic weighing and recording car-scale, the combination with the scale-platform, of two track-levers 81, 81, of two pawl-carrying slides 88, 88, connected one with each of said track-levers, two ratchets 92, 92, having each a shaft 93, furnished with

cams 94 and 104, bent levers 95, 95, operated by said cams 94 and a connecting-rod 96, and levers 105, 105, operated by said cams 104 and connecting-rod 106, substantially as specified.

GEORGE GOETZ.

Witnesses:

H. M. MUNDAY,

EDMUND ADCOCK.