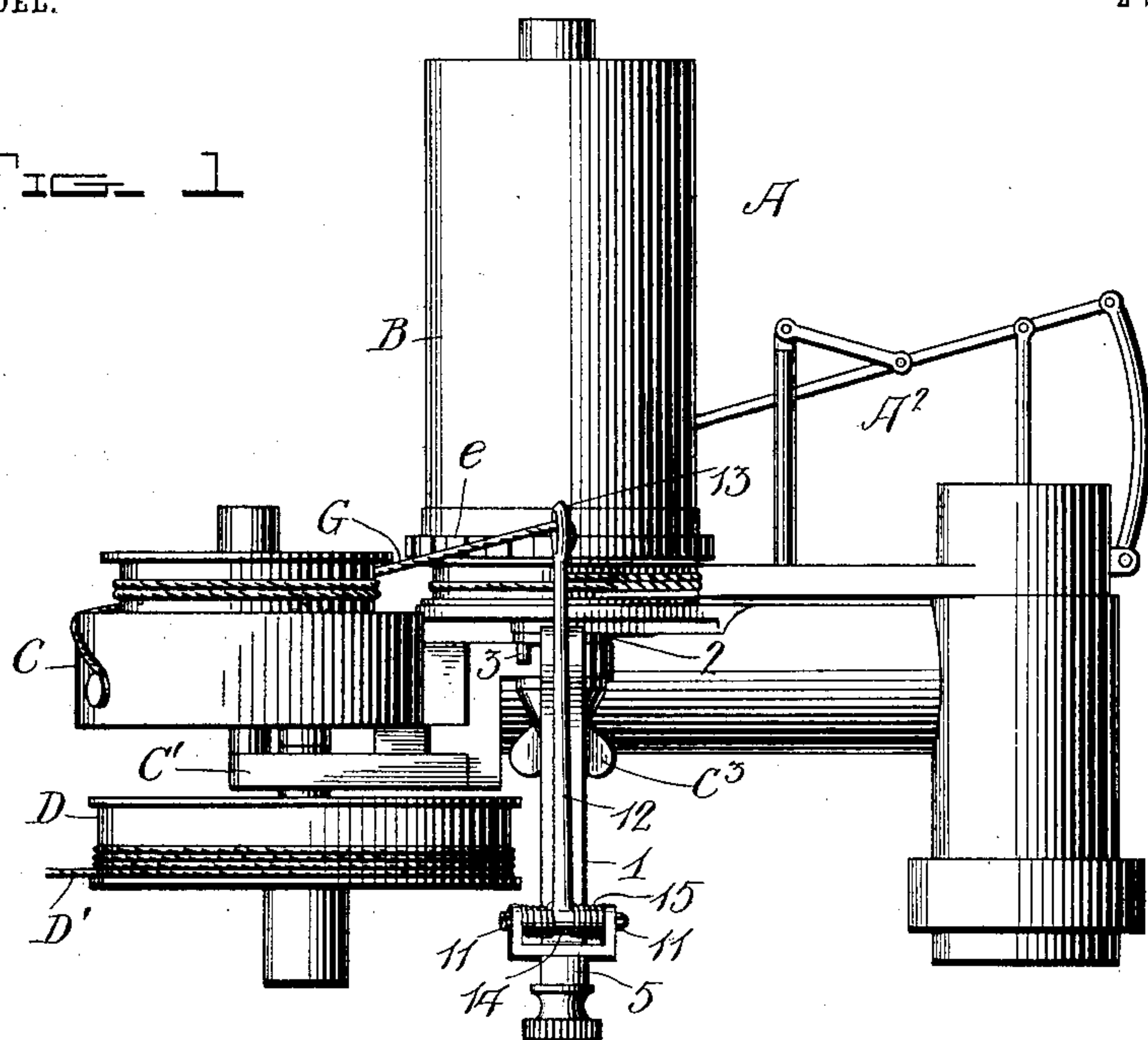


PATENTED NOV. 10, 1903.

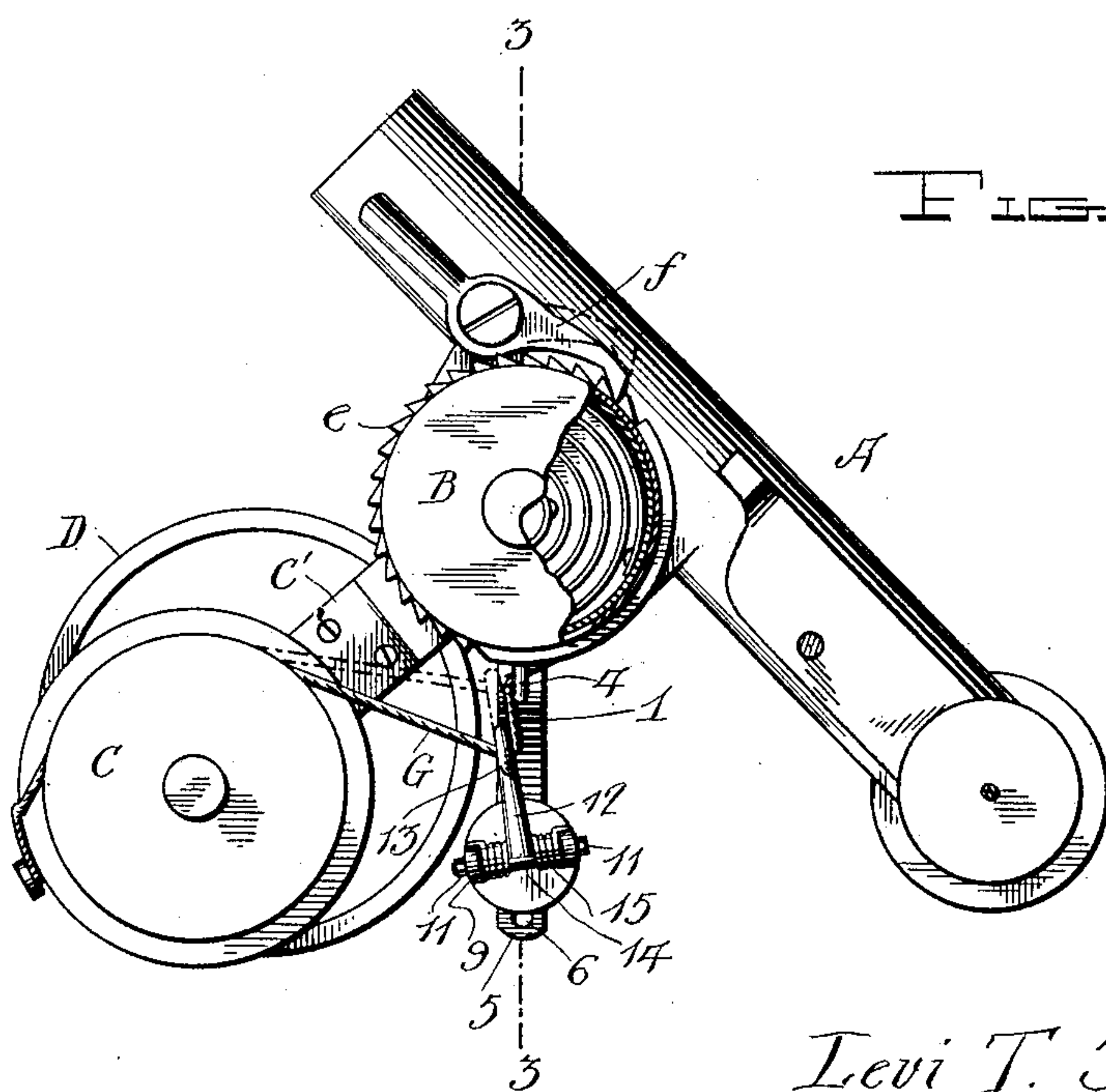
APPLICATION FILED OCT. 16, 1902.

NO MODEL.

2 SHEETS—SHEET 1.



1 2 3



Inventor

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No. 743,944.

PATENTED NOV. 10, 1903.

L. T. SNOW.
STEAM ENGINE INDICATOR.

APPLICATION FILED OCT. 16, 1902.

NO MODEL.

2 SHEETS—SHEET 2.

FIG. 3

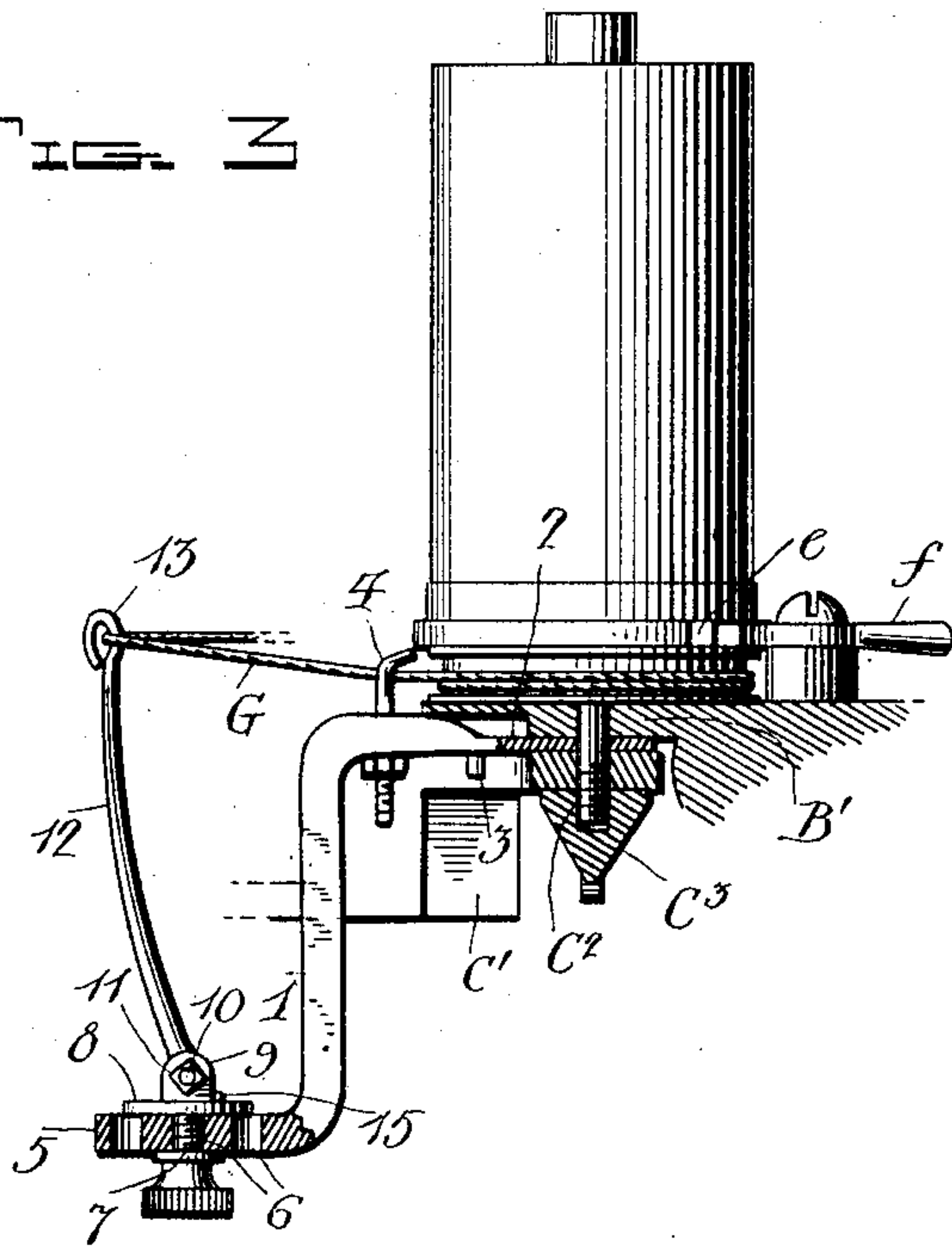


FIG. 4

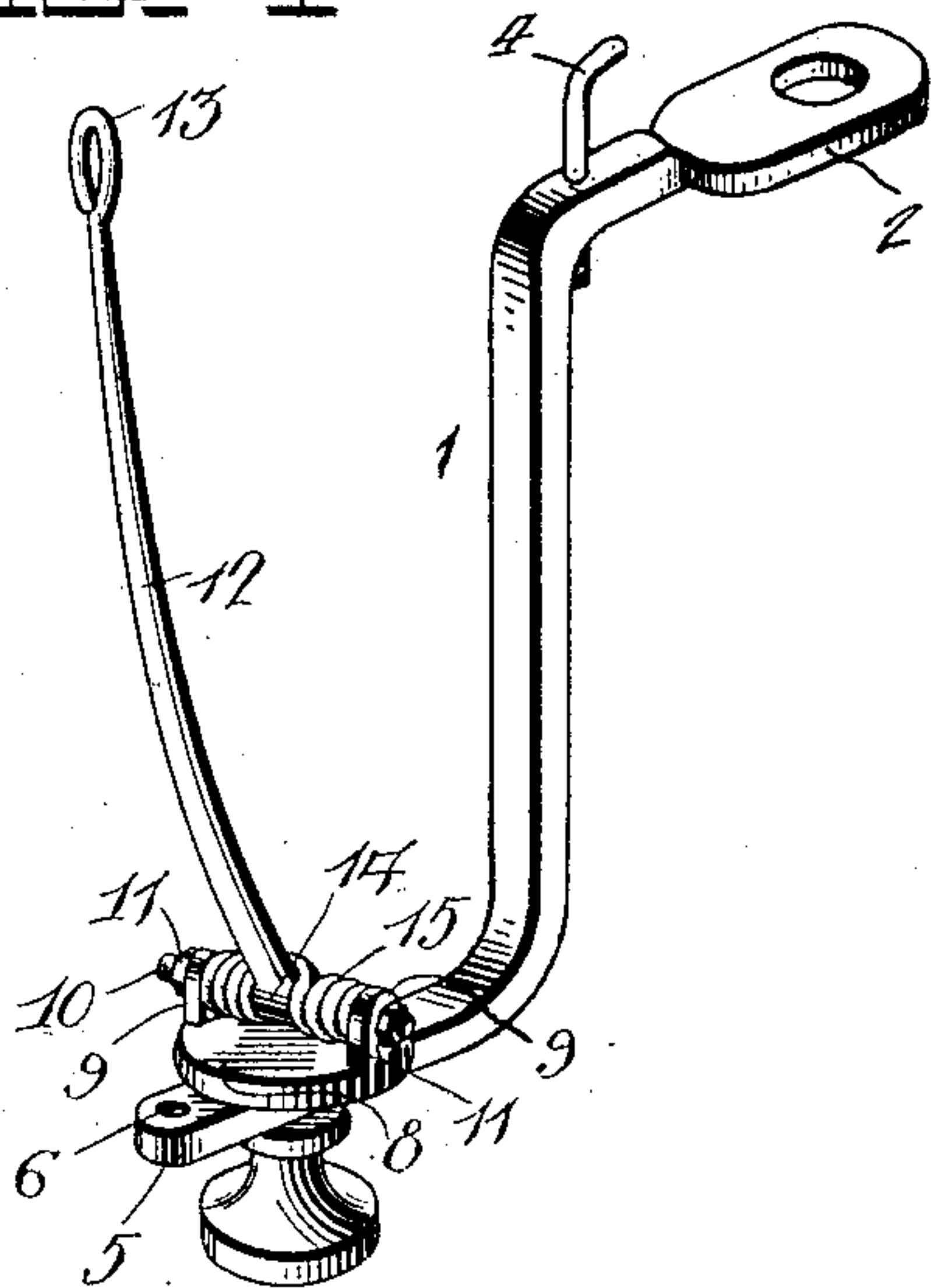
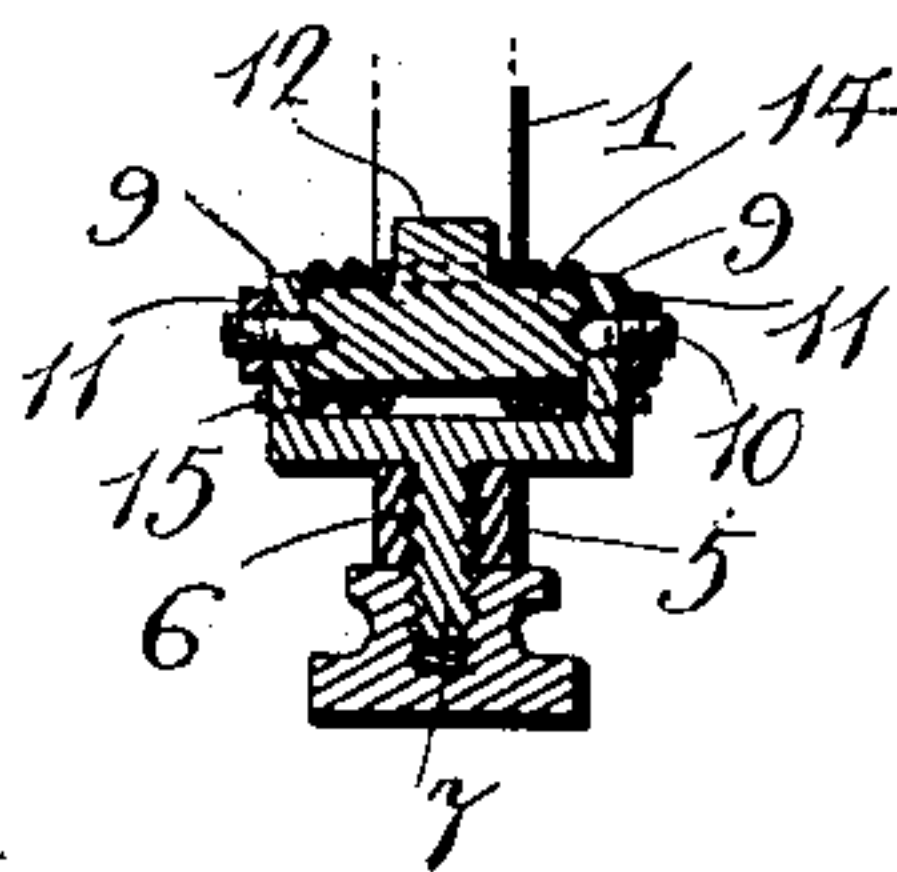


FIG. 5



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UNITED STATES PATENT OFFICE.

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STEAM-ENGINE INDICATOR.

SPECIFICATION forming part of Letters Patent No. 743,944, dated November 10, 1903.

Application filed October 16, 1902. Serial No. 127,567. (No model.)

To all whom it may concern:

Be it known that I, LEVI T. SNOW, a citizen of the United States, residing at New Haven, in the county of New Haven and State of Connecticut, have invented certain new and useful Improvements in Steam-Engine Indicators; and I do declare the following to be a full, clear, and exact description of the invention, such as will enable others skilled in the art to which it appertains to make and use the same.

This invention relates to certain new and useful improvements in steam-engine indicators.

One object of the invention is to provide means for taking up slack in the cord connecting the indicator and reducing device, thereby preventing liability of damage consequent upon the slackened cord becoming entangled in the operative mechanism of the indicator; and a further object of the invention is to provide a take-up attachment applicable for use with any kind of reducing mechanism and on any known style of indicator.

With these and other objects in view the invention consists of certain novel features of construction, combination, and arrangement of parts, as will be hereinafter more fully described, and particularly pointed out in the appended claims.

In the accompanying drawings, Figure 1 is a view in side elevation of a steam-engine indicator embodying my invention. Fig. 2 is a top plan view thereof, the indicator-drum appearing in horizontal section. Fig. 3 is a vertical section on line 3 3 of Fig. 2 looking toward the reducing-drum. Fig. 4 is a perspective view of the take-up device. Fig. 5 is a detail section through the head of the take-up device and associated parts of the bracket and arm.

A in the drawings represents the indicator, which carries the ordinary spring-actuated card-drum B and supports the spring-actuated reducing-drum C, the latter being geared with the wheel D, on which is wound the engine-cord D'. The drum B is provided with ratchet-teeth *e*, adapted to be engaged by a pawl *f* on a stationary part of the indicator,

said pawl when engaged with the ratchet-teeth serving to hold the card-drum against retrograde movement—i. e., against retraction by its spring. As shown in the present instance, the drum C is carried by a bracket C', which is fitted upon a screw-stud C², projecting below the supporting-shelf B' of the drum B and clamped by a nut C³, applied to said stud, and the indicator proper is of a well-known type in common use, while the reducing mechanism is of the type shown in Patent No. 515,175, granted to me and F. H. Pierpont February 20, 1894. I do not, however, limit the invention to use in connection with this or any other particular type of indicator and reducing mechanism, as slight variations in the supporting-bracket of the take-up device will enable it to be used upon any form of indicator employing a spring-actuated card-drum.

G represents the cord which connects the two drums B and C and turns said drum B in one direction against the tension of its spring when the drum C is operated under the action of the cord D' on wheel D. When the drum B is thrown out of action by engaging the pawl *f* with ratchet *e*, the cord G slacks up between the drums and is liable to drop down and become entangled with the parts of the mechanism. The purpose of my invention is to obviate this objection, and to this end I provide a take-up device consisting of a bracket 1, having at one end a flange 2, which is perforated for passage of the stud C², so that it may be applied thereto and clamped like the bracket C' by the nut C³. This flange is disposed at such an angle to the main arm or body of the bracket as to extend horizontally, while said arm projects outwardly and downwardly, so as to stand out beyond the plane of the drum A. On the flange is formed a lug 3, acting as a guide and stop to abut against the bracket C', indicating the proper angle at which the bracket 1 should set relative to said bracket C' and preventing the bracket 1 from contacting with and interfering with the movement of the wheel D. Adjacent to this lug the bracket 1 is provided with an adjustable in-bent finger 4, forming a guide to maintain the contiguous

portion of the cord G at all times in contact with the card cylinder or drum A.

The lower end of the bracket 1 is bent to form a foot 5, which is provided with one or more openings 6 to receive a fastening-screw 7, projecting from a head 8 down through an opening in the foot 5 and provided with a nut 7', whereby said head is clamped to the foot. The head 8 rests on said foot 5 and is provided with two upwardly-extending ears 9, perforated to receive the threaded ends of pivot-pins 10, held from endwise movement by nuts 11. On these pins is mounted a swinging take-up arm 12, which is provided at its upper end with a guide 13 to receive the cord G at a point between the two cylinders A and B and is formed at its lower end with a cross-piece 14, provided at its ends with sockets receiving the pins 10. The arm 12 is normally forced outward by a spring 15, looped at its center about the rear of the arm and having its ends coiled about the ends of the cross-piece 14 and then bent to bear against the rear edges of the ears 9, whereby the coiled portions of the spring are placed under tension and tend to project the arm outward. By means of the screw 7, which, as stated, is adapted to be fitted in either one of the openings 6, the arm 12 may be adjusted along the foot 5 so as to stand closer to or farther from the cylinder A, and at the same time the head 8 may be turned to set the arm at any desired angular relation. Fig. 2 shows in full and broken lines the position of the arm when the cord G is taut and slackened, from which it will appear that normally the arm 12 is held inward by the cord and simply exerts a desired tension thereon, but that when the cord becomes slack the arm moves outward, taking up the slack and preventing the cord from dropping down and becoming entangled with any of the parts of the indicating or reducing mechanisms. From this the operation of the device in automatically taking up the slack in the cord will be readily apparent.

It will thus be seen that the invention provides a take-up which is simple, cheap, and efficient for its intended purpose and is applicable for use in connection with any ordinary form of indicator.

While the construction shown is deemed preferable, still changes in the form, proportion, and the minor details of construction may be resorted to without departing from the principle or sacrificing any of the advantages of this invention.

Having thus described my invention, what I claim, and desire to secure by Letters Patent, is—

1. In a steam-engine indicator, the combination with a spring-actuated card-drum, a reducing device, and a cord connecting said card-drum and reducing device, of a tension device comprising a bracket secured to the frame of the indicator, a cord-guide carried

by the bracket to maintain the cord in contact with the card-drum, and a spring-actuated take-up arm mounted upon the bracket, said arm being adapted to swing in a plane transverse to the line of movement of the cord to take up the slack therein when the movement of the card-drum is arrested, substantially as described.

2. In a steam-engine indicator, the combination with a spring-actuated card-drum, a reducing device, and a cord connecting said card-drum and reducing device, of a take-up device comprising a bracket having an attaching-flange and a foot below the flange, said attaching-flange being secured to the frame of the indicator, a cord-guide adjacent to the flange, and a spring-actuated arm carried by the foot and having a guide at its upper end which is disposed normally in the plane of the aforesaid guide, said arm being mounted to swing in a plane transverse to the line of movement of the cord, substantially as described.

3. In a steam-engine indicator, the combination with a spring-actuated card-drum, a reducing-drum, and a cord connecting said drums, of a bracket, means for holding the bracket in fixed relation to the reducing-drum, means for holding the cord in contact with the card-drum, and a spring-actuated arm carried by the bracket and engaging said cord between the drums, said arm being normally pressed outwardly by its spring and having movement in a plane transverse to the line of movement of the cord to take up the slack therein when the movement of the card-drum is arrested, substantially as described.

4. In a steam-engine indicator, the combination with a spring-actuated card-drum, a reducing-drum, and a cord connecting said drums, of a bracket, means securing the bracket to the frame of the indicator, a stop upon the bracket serving as a guide to prevent movement of the bracket beyond a certain extent in the direction of the reducing device, means carried by the bracket to maintain the contiguous portion of the cord in close relation to the card-drum, and a spring-actuated take-up arm carried by the bracket and engaging the cord, said arm having movement in a plane transverse to the line of movement of the cord to take up the slack therein when the movement of the card-drum is arrested, substantially as described.

5. In a steam-engine indicator, the combination with a card-drum, a reducing-drum, and a cord connecting said drums, of a take-up device comprising a bracket vertically disposed and provided with a horizontal foot-piece, a head axially and longitudinally adjustable on the foot-piece, and a swinging take-up arm engaging the cord between the drums, and spring-actuated to have movement in a direction transverse to the line of movement of the cord to take up the slack

therein when the movement of the card is arrested, said arm being adjustable with the head to set it closer to or farther from the card-drum and at different angles thereto, substantially as described.

6. In a steam-engine indicator, the combination with a spring-actuated card-drum, a reducing-drum, and a cord connecting said drums, of a take-up device comprising a bracket secured to the frame of the indicator and vertically disposed and provided with a horizontal foot-piece, a head provided with spaced ears and mounted upon the foot-piece, pins carried by said ears, a shaft or cross-piece having a pivotal engagement with the

pins, an arm carried by the cross-piece and engaging the cord between the drums, said arm having movement upon said shaft in a direction transverse to the line of movement of the cord, and a spring acting on said cross-piece to move the arm in a direction away from the bracket and card-drum, substantially as described.

In testimony whereof I have hereunto set my hand in presence of two subscribing witnesses.

LEVI T. SNOW.

Witnesses:

ROBERT PIERPONT,
MAUDE L. BEECHING.