

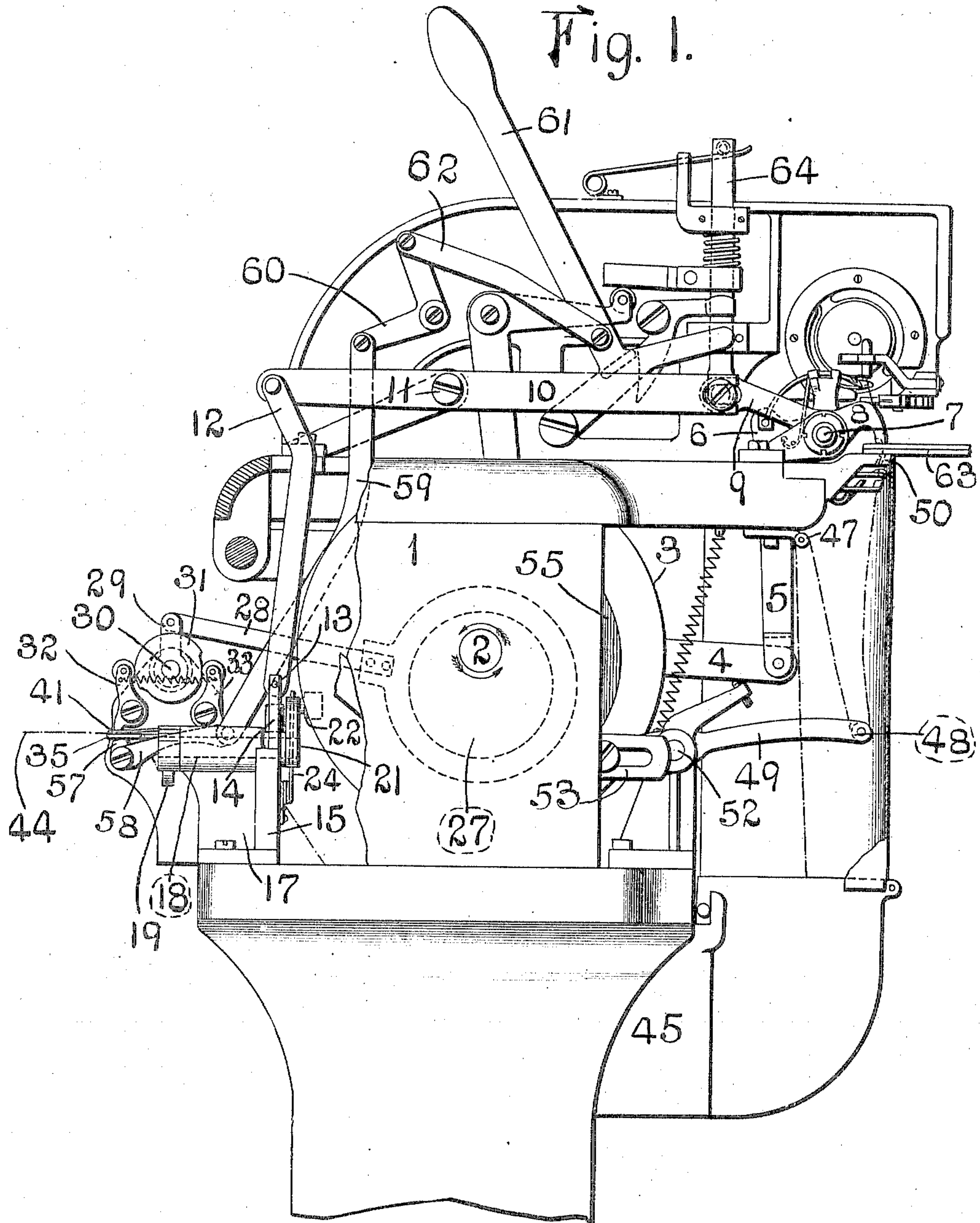
No. 811,583.

PATENTED FEB. 6, 1906.

C. PEDERSEN.  
THREAD MEASURER FOR SEWING MACHINES.

APPLICATION FILED AUG. 14, 1905.

4 SHEETS—SHEET 1



Witnesses

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No. 811,583.

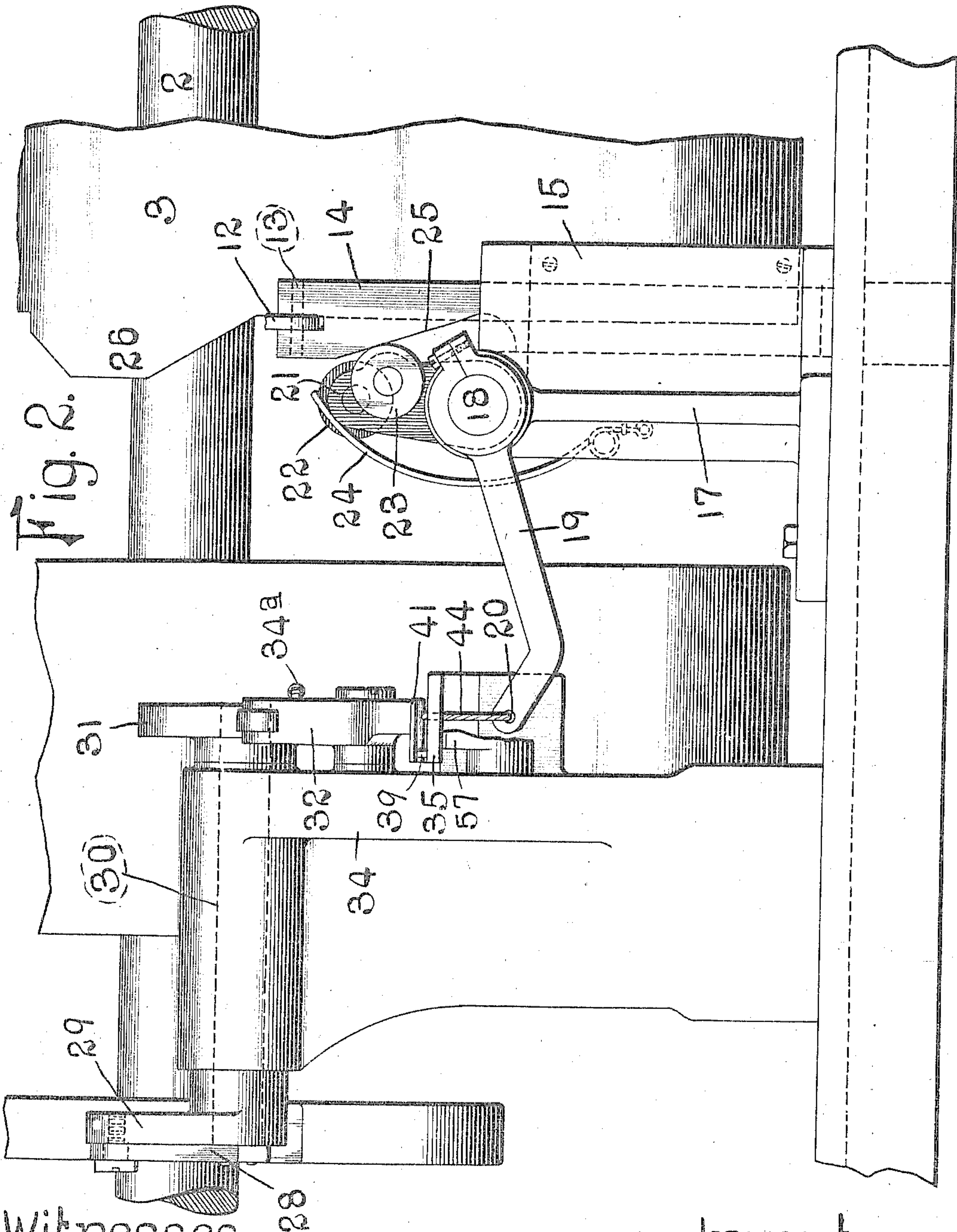
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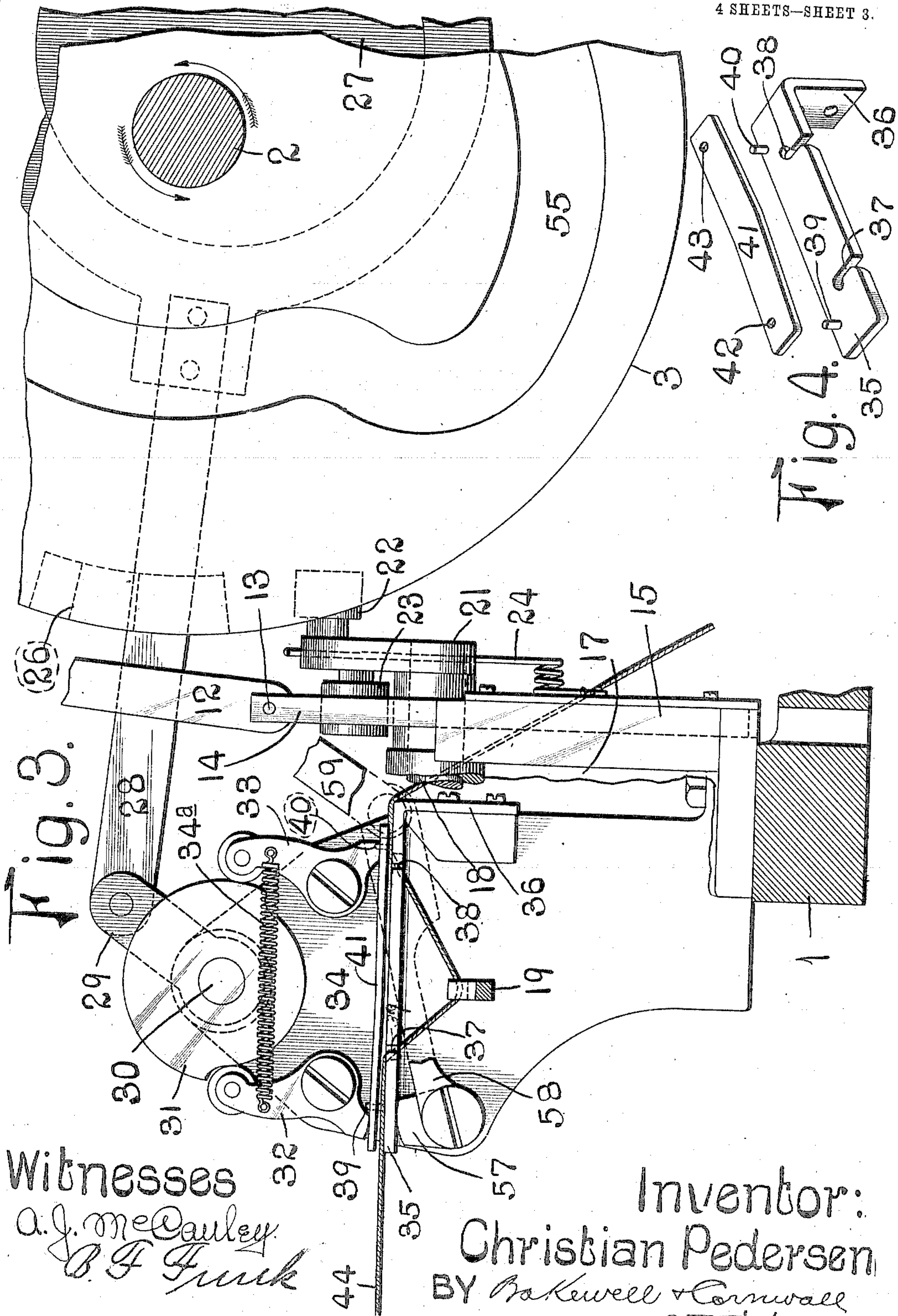


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4 SHEETS—SHEET 4.

Fig. 5.

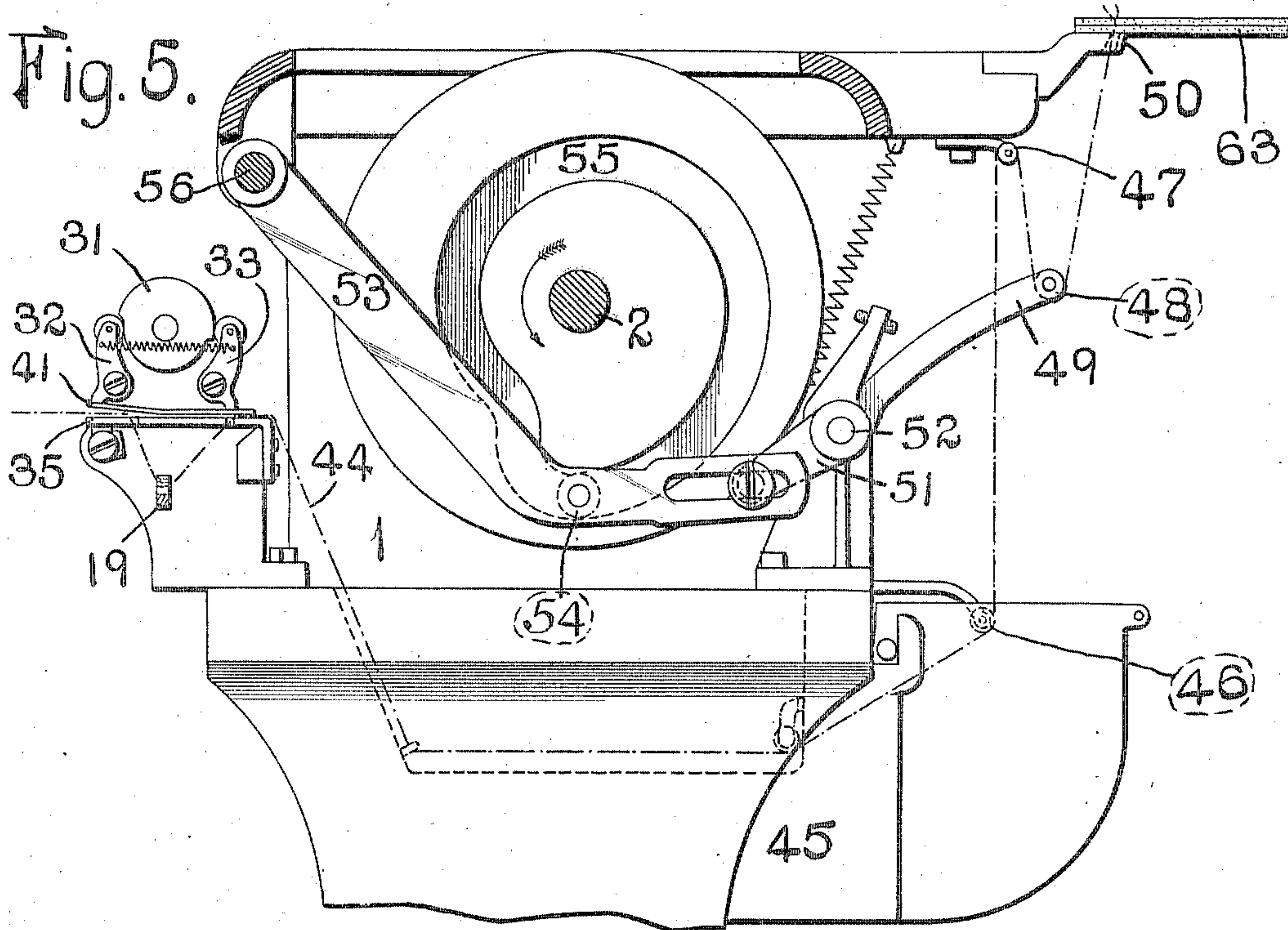
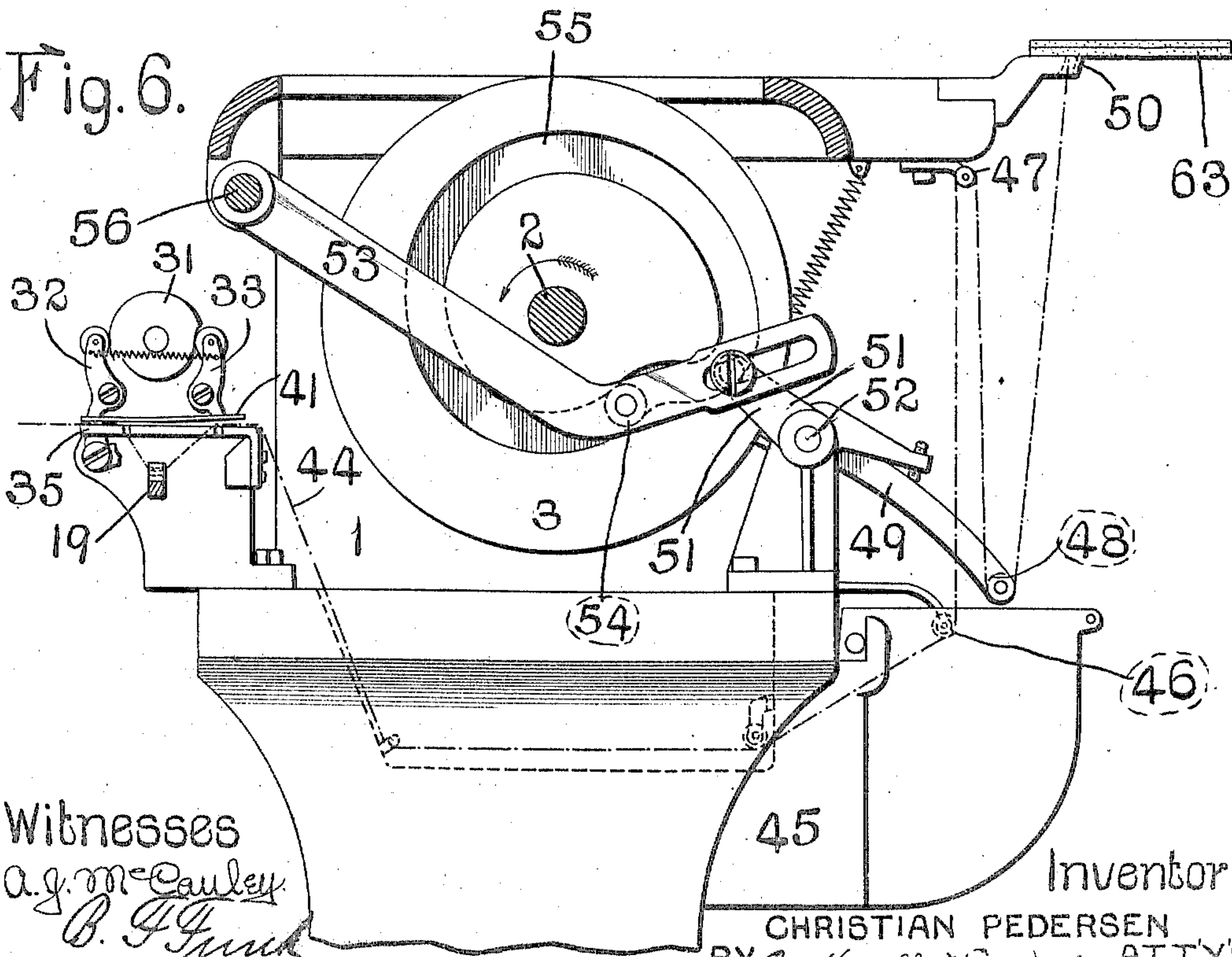


Fig. 6.



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# UNITED STATES PATENT OFFICE.

CHRISTIAN PEDERSEN, OF ST. LOUIS, MISSOURI, ASSIGNOR TO LANDIS MACHINE COMPANY, OF ST. LOUIS, MISSOURI, A CORPORATION OF MISSOURI.

## THREAD-MEASURER FOR SEWING-MACHINES.

No. 811,583.

Specification of Letters Patent.

Patented Feb. 6, 1906.

Application filed August 14, 1905. Serial No. 274,118.

*To all whom it may concern:*

Be it known that I, CHRISTIAN PEDERSEN, a citizen of the United States, residing at St. Louis, Missouri, have invented a certain new and useful Improvement in Thread-Measurers for Sewing-Machines, of which the following is a full, clear, and exact description, such as will enable others skilled in the art to which it appertains to make and use the same, reference being had to the accompanying drawings, forming part of this specification, in which—

Figure 1 is a view in elevation of the thread-measuring mechanism for a sewing-machine and the appurtenances cooperating therewith. Fig. 2 is an enlarged end elevational view of the thread-measuring mechanism. Fig. 3 is an enlarged elevational view of the thread take-off. Fig. 4 is a detail perspective view of the thread-locking plates. Figs. 5 and 6 are side elevational views of part of a sewing-machine mechanism, showing the thread-measuring device and the take-up at their two extreme positions.

This invention relates to sewing-machines, and particularly to a thread-measuring mechanism therefor which will be adapted to take off the requisite amount of thread for the stitch irrespective of the differences in thickness of the material introduced between the work-table and the presser-foot. Another object of the invention is to provide a thread-measurer which will at all times remove the exact amount of thread required for making the stitch.

Another object of the invention is to provide means for locking the thread between the source of supply and the source of consumption after each measurement; and a further object is to provide means for temporarily unlocking the thread should occasion demand.

Other objects and advantages, as well as the novel details of construction of this invention, will be specifically described herein-after, it being understood that changes in form, proportion, and minor details of construction may be resorted to without departing from the spirit or sacrificing any of the advantages thereof.

Referring now to the drawings by numerals of reference, 1 designates the frame of the machine, in which is journaled a shaft 2, mov-

ing in the direction indicated by the arrows. On the shaft 2 is a cam 3, operating a lever 4, which is connected to the needle-bar 5, which in turn is connected to a link 6 on a rock-shaft 7, carrying the needle, its guide, and the presser-foot, which presser-foot is designated by the reference-numeral 8. The presser-foot 8 is provided with a rearwardly-extending portion 9, connected to a lever 10, fulcrumed at 11 and having a terminal connection with a vertically-reciprocatory link 12, provided with a pivotal connection 13, whereby it is secured to the sliding cam 14 in a slideway 15. Journaled in a bracket 17 on the frame is a rock-shaft 18, having a thread-removing arm 19, provided with an eye 20, through which the thread passes. The rock-shaft 18 is provided with an upstanding crank-arm 21, in the end of which is a roller 22, and to the side of this crank-arm is a second roller 23.

24 designates a spring secured to the bracket 17 and bearing against the crank-arm 21, so as to cause the roller 23 at the side of the crank-arm 21 to at all times raise against the cam-face 25 of the cam-slide 14. On the cam-disk 3 is a cam projection 26, which is adapted to contact with the roller 23 during the revolution of the cam-disk 3. On the shaft 2 is an eccentric 27, which operates a pitman 28, connected to a crank-arm 29 on a rock-shaft 30. This rock-shaft carries a cam 31, which is adapted to oscillate, so as to alternately actuate the pivoted locking-levers 32 and 33 on the bracket 34, supported at the rear of the machine, said levers 32 and 33 being resiliently connected by a spring 34<sup>a</sup>. Immediately below these levers 32 and 33 is an approximately rigid plate 35, which is provided with a depending projection 36, fastened to the machine-frame, the horizontal portion of said plate being provided with thread-openings 37 and 38. Upstanding pins 39 and 40 are provided on the plate 35 and constitute guides for the spring-plate 41, which is provided with openings 42 and 43, through which said pins enter. The ends of the plate 41 are sprung upward slightly, as will be presently explained.

The thread 44 may be fed from any suitable source of supply as, for example, a spool—and by reference to Fig. 3 it will be noted that it is interposed between the plates 35 and 41, passing through the opening 37,



thence around the take-off lever 19, thence through the opening 38, thence down through the wax-pot 45, thence around the pulley 46 adjacent the wax-pot, thence over the pulley 47 above the wax-pot, thence around a pulley 48 on the take-up arm 49, and finally to the thread-laying mechanism adjacent the work-table 50.

The take-up lever is actuated by a crank 51 on the rock-shaft 52, carrying said lever 49, the crank 51 being operated by an elbow-lever 53, having a roller 54 in a cam 55 on the disk 3. The lever 53 is fast on a rock-shaft 56; but as the take-up mechanism forms the subject-matter of a separate application filed by me of even date herewith and given Serial No. 274,113 I do not deem it necessary to describe it in detail in this application. It will be sufficient to say that the take-up lever is operated in time with the thread-measuring device, so that when thread is being taken from the source of supply the take-up lever will be in its elevated position, as illustrated in Fig. 5; but when the thread has been measured and the take-off lever has moved to a position so that the thread may be utilized by the needle mechanism the take-up lever 49 will be depressed, as shown in Fig. 6.

I have described the lower plate of the thread-measuring mechanism as being substantially rigid. Normally this is true; but under certain conditions it may be sprung to release the thread. The plate 35 is normally held rigid by a pivoted stop 57, having an arm 58, connected to a link 59, which in turn is connected to a bell-crank lever 60, having one of its arms connected to the shift-lever 61 by a link 62. The shift-lever 61 is the same as is described in my companion application filed of even date herewith and utilized for the presser-foot release mechanism. While the stop 57 will normally rest against the plate 35 to hold it rigid, it may be removed from engagement with said plate for the purpose of pulling the thread through the thread-measuring device when the machine is being threaded or for any purpose when the machine is not actually sewing. In order to permit the plate 35 to yield, the lever 61 may be moved in the direction indicated by the arrow and through the medium of the connections with the arm 58 the stop 57 will be moved out of engagement with said plate 35, so that the thread will not bind between said plate 35 and the plate 41.

In measuring the thread the sewing mechanism and presser-foot mechanism, as well as the shuttle and the other appurtenances, will be timed in their operations so that the requisite amount of thread will be taken off by the take-off lever 19 at the proper time. The manner of governing the amount of thread is as follows: The material, which is designated by the reference-numeral 63, will be placed on the work-table 50 and the engaging por-

tion of the presser-foot 8 will be raised a sufficient distance to accommodate the thickness of the work. This raising of the forward end of the presser-foot will impart a movement to the lever 10, and through this lever a vertical movement will be imparted to the link 12, connected to the cam-slide 14. The vertical movement of the cam-slide will determine the relative position of the crank-arm 22 with respect to the cam 26. For example, if a thick piece of work is inserted between the presser-foot and the work-table the rear end of the presser-foot will be depressed to a greater extent than if a thin piece of work was inserted between the work-table and the presser-foot. The thick piece of work will depress the rear portion of the presser-foot, and thereby depress the forward end of the lever 10 and raise the link 12. This raising of the link 12 will in turn raise the slide 14, so that the deep portion of the cam 25 will be adjacent to the roller 23. The spring 24 will force the arm 21 toward the cam, so as to maintain the roller 23 in engagement with the cam-face 25 of the slide 14 at all times. It will therefore follow that the roller 21 will be in a position to receive a considerably-greater throw from the cam projection 26 than it would be if the shallow portion of the cam was opposite the roller 23, (as it would be if a thin piece of work was inserted between the presser-foot and the work-table.) As the crank-arm 21 will receive a considerable throw from the cam projection 26, a considerable movement will be imparted to the take-off lever 19. While the take-off lever 19 is moving to take off the thread from the source of supply the cam 31 will be in the position indicated in Fig. 3 with the clamping-lever 33 bearing on the end of the plate 41 distant from the source of supply. As soon as the take-off lever has moved down its complete stroke and begins to recede the cam 27 will actuate the cam 31, so as to lock the thread 44 between the plates 35 and 41 at the end nearest the source of supply, so that the cam 31 will be in the position shown in Fig. 1. When the cam is in the position shown in Fig. 1, the ends of the plates distant from the source of supply nearest to the source of consumption will be opened, so that the take-up lever 49 may take up the thread which has been removed by the take-off lever 19, and in the latter case it will be in the position indicated in Fig. 6, whereas when the thread is being removed by the take-off lever from the source of supply the take-up lever 49 will be in the position shown in Fig. 5. Of course it is to be understood that the thread-laying mechanism, the needle-operating mechanism, and the shuttle are all to be operated in their proper sequence, so as to insure the proper operation of the machine.

From the foregoing it will be clearly apparent that if a comparatively thick piece of



work will cause an upward movement of the slide 14 to cause a comparatively large throw of the lever 19 a relatively thin piece of work inserted between the presser-foot and the work-table will cause the slide 14 to be depressed and move the crank-arm 21 farther away from the cam projection 26, so that a comparatively slight throw of the take-off lever 19 will result and a smaller amount of thread will be measured for the work, as is required. The presser-foot 8 will be automatically caused to engage the work by the vertical bar 64, which is connected to the portion 19 thereof, said bar 64 being the same bar as is described in my companion application of even date herewith and given Serial No. 274,117 for presser-feet mechanism.

I claim—

1. In a sewing-machine, an element for measuring thread, a clamping means on the respective sides of the thread-measuring element said clamping means comprising a normally rigid base-plate, means for alternately clamping the thread against the respective end portions of said base-plate and means for temporarily destroying the rigidity of said base-plate, substantially as described.

2. In a sewing-machine, a thread-measuring element, means for alternately clamping the thread before and after each operation of the thread-measuring element said means comprising a rigid base-plate and a spring-plate above the same whose ends bind the thread first against one end portion of the base-plate and then against the other end of said base-plate, substantially as described.

3. In a sewing-machine, a thread-measuring element and a thread-clamping means comprising a base-plate having an inherent yielding tendency, means for normally holding the base-plate rigid, means for alternately clamping the thread to the base-plate near the respective ends thereof and means for temporarily destroying the rigidity of said base-plate, substantially as described.

4. In a sewing-machine, a thread-measuring element, and a thread-clamping means cooperating therewith comprising a base-plate, a spring-plate above the same, rocking elements for binding the respective ends of said spring-plate against the base-plate and a rocking cam for alternately actuating said rocking elements, substantially as described.

5. In a sewing-machine, a thread-measuring element, and a thread-clamping means cooperating therewith comprising a base-plate, a spring-plate above the same, rocking elements for binding the respective ends of said spring-plate against the base-plate and means for alternately actuating said rocking element, substantially as described.

6. In a sewing-machine, a thread-measur-

ing element comprising an arm, a rock-shaft carrying said arm, a rock-arm on said rock-shaft, a slide having a cam-face for engagement with said rock-arm, an actuating-cam for engagement with said rock-arm and means for moving the slide so as to vary the operative engagement of the actuating-cam with the rock-arm, substantially as described.

7. In a sewing-machine, a thread-measuring element a rocker-shaft carrying said thread-measuring element, an arm carried by said rocker-shaft, a slide having engagement with said arm, an actuating-cam for rocking the shaft and having intermittent engagement with said arm, a presser-foot mechanism, and means connected to the slide and to the presser-foot mechanism whereby the engagement of the slide with the arm on the rock-shaft will be governed by the position of the presser-foot above the work-table, substantially as described.

8. In a sewing-machine, the combination of a rocking thread-measuring element, a clamping base-plate above said thread-measuring element, a spring-plate above the base-plate, rocking elements adapted to alternately bind the respective ends of the spring-plate against the base-plate and a cam-actuated cam for alternately operating the rocking elements, substantially as described.

9. In a sewing-machine, the combination of a rocking thread-measuring element, a spring-plate, a base-plate, rocking elements above the spring-plate adapted to alternately bind the respective end portions of the spring-plate against the base-plate, a spring connecting said rocking elements and a rocking cam having alternate engagement with said rocking elements, substantially as described.

10. In a sewing-machine, the combination with a presser-foot, a lever connected to said presser-foot, a slide having a cam-face, a connection between the lever and slide, a rock-shaft, an arm connected to said rock-shaft and bearing against the cam-face, an actuating-cam for said rock-arm, a thread-measuring element carried by said rock-arm, said elements being arranged so that the position of the presser-foot with respect to the work will govern the position of the cam-face with respect to the rocker-arm and thereby control the operative engagement of the actuating-cam with respect to the rocker-arm, substantially as described.

In testimony whereof I hereunto affix my signature, in the presence of two witnesses, this 11th day of August, 1905.

CHRISTIAN PEDERSEN.

Witnesses:

B. F. FUNK,

GEORGE BAKWELL.