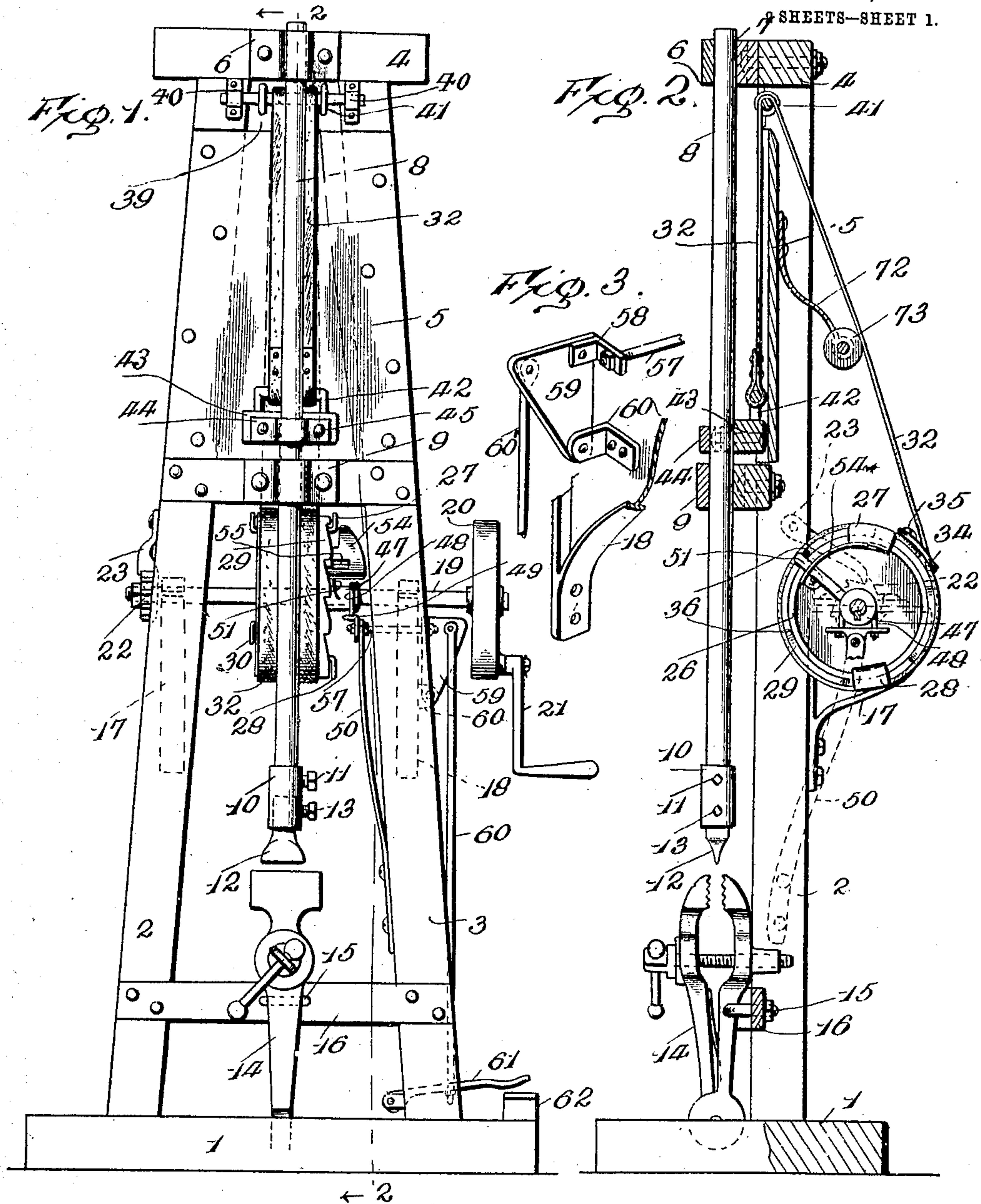


J. W. WAGNER.
 DROP HAMMER.
 APPLICATION FILED OCT. 31, 1907.

916,231.

Patented Mar. 23, 1909.

SHEETS—SHEET 1.



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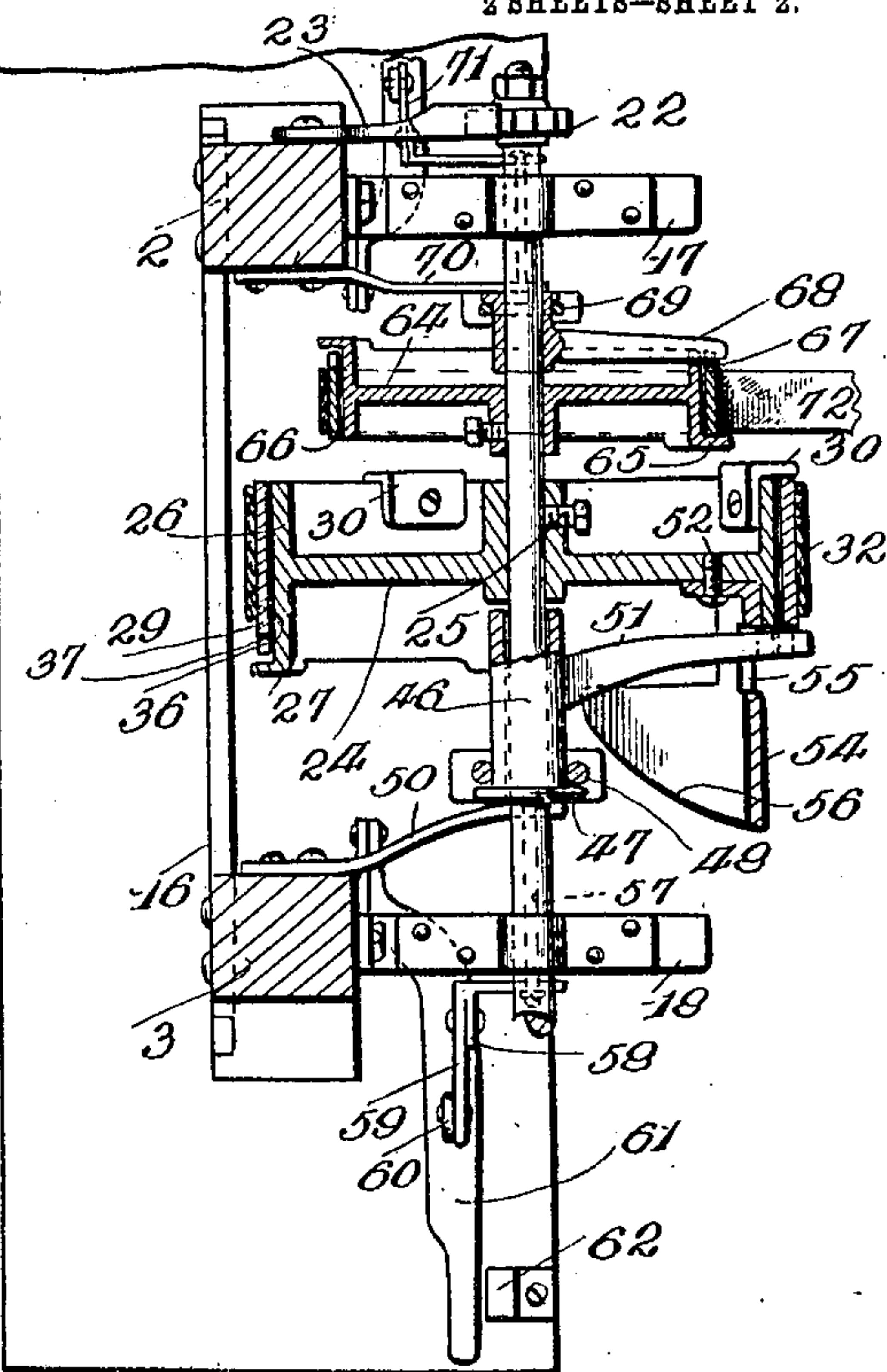
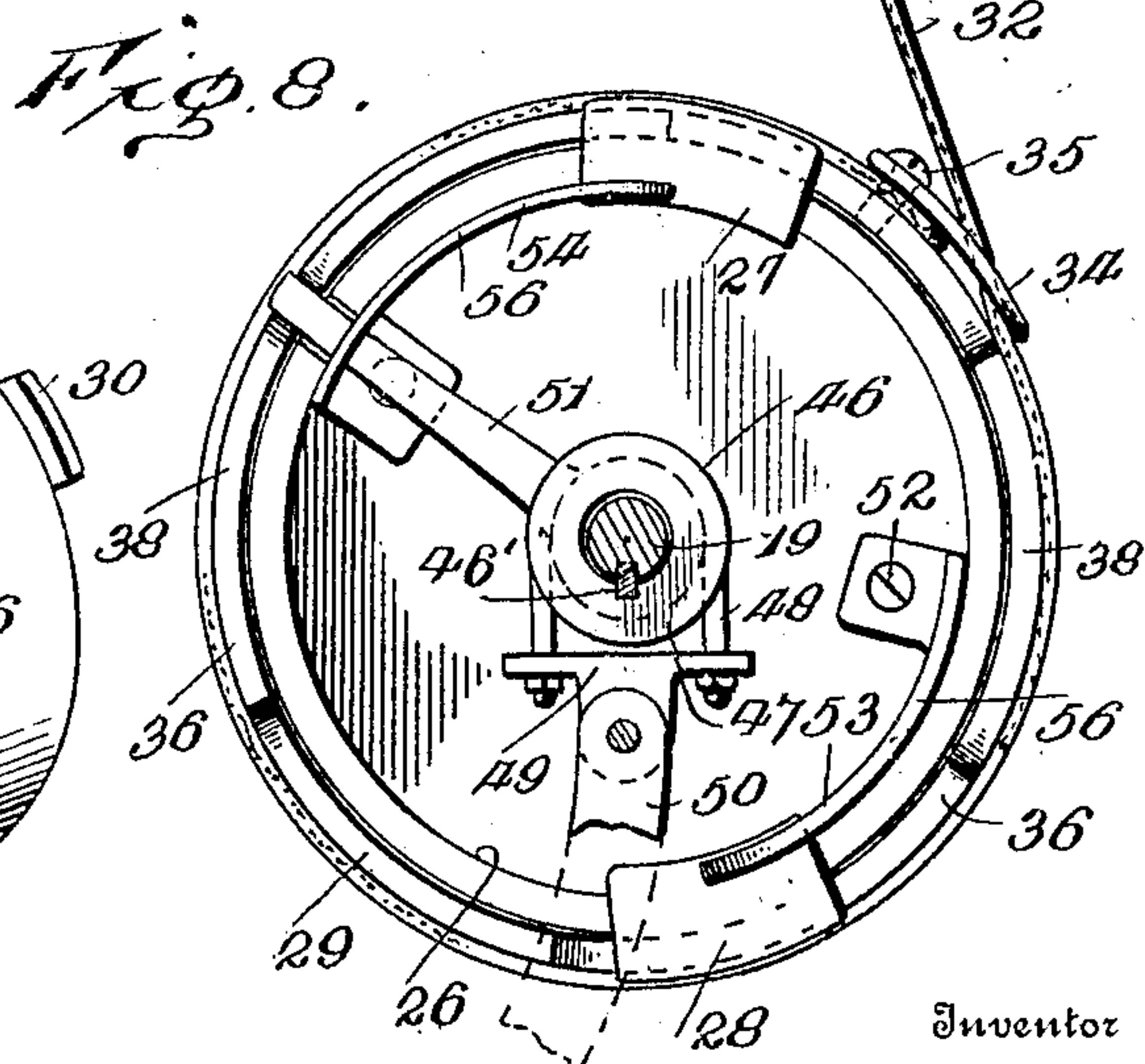
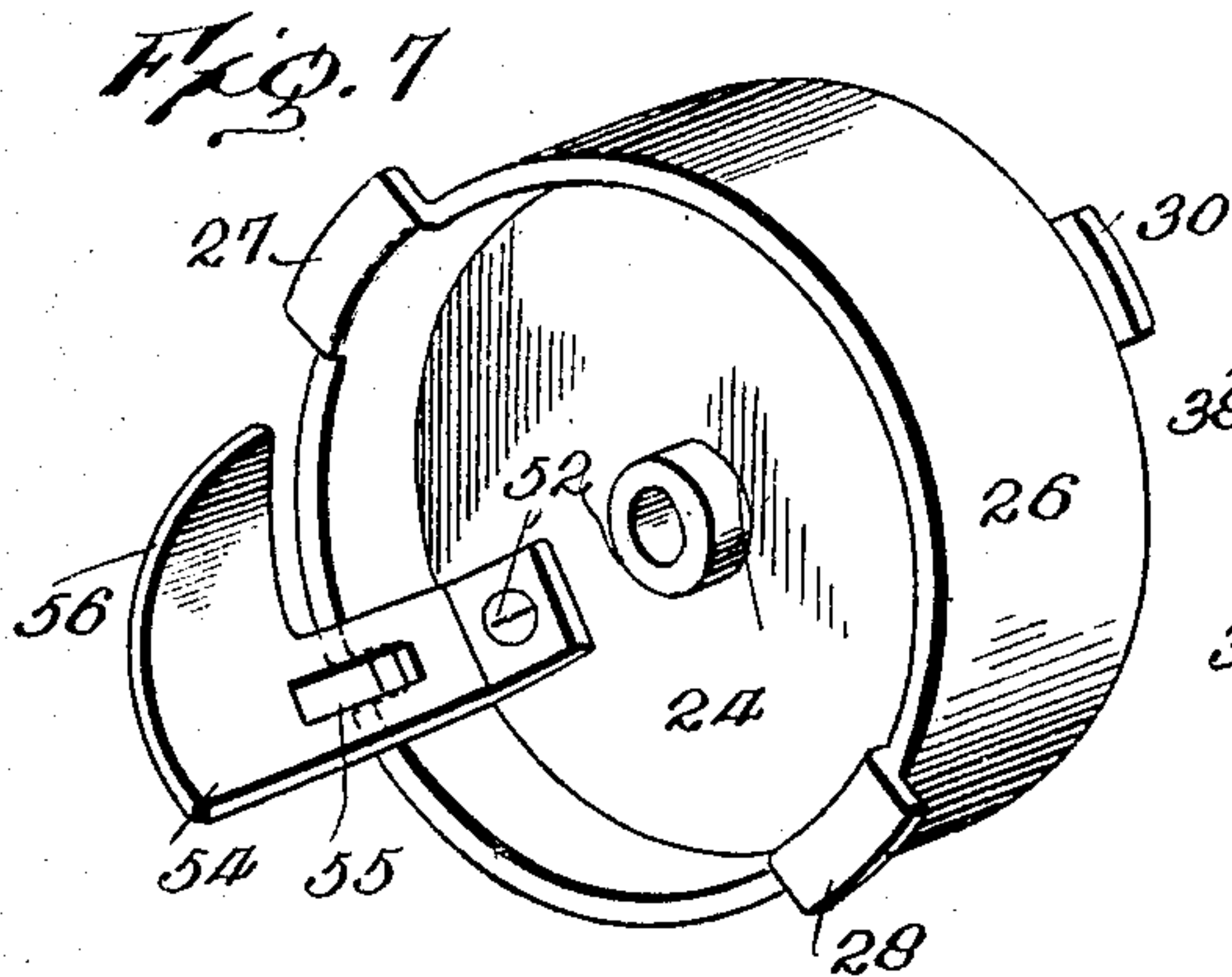
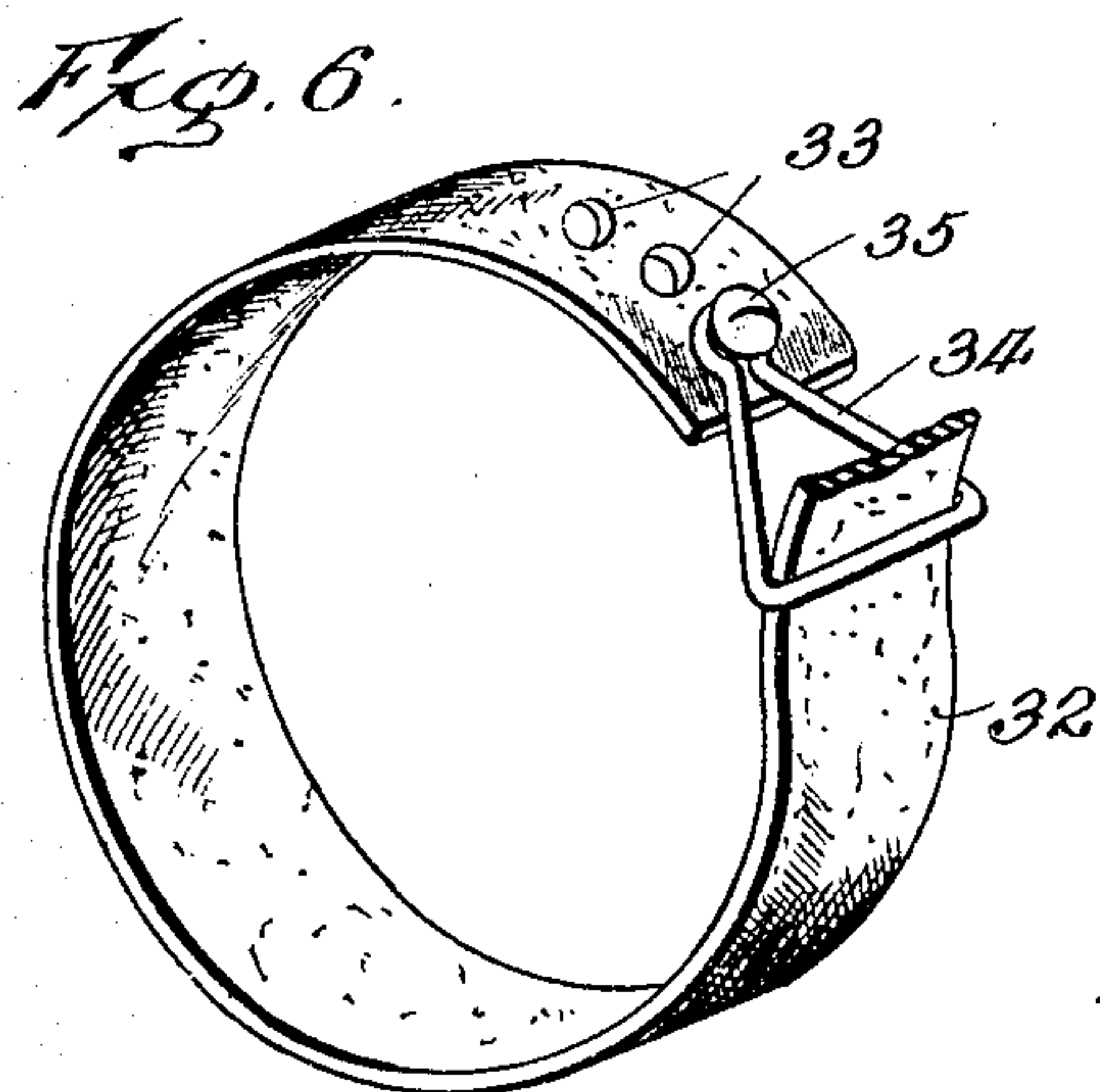
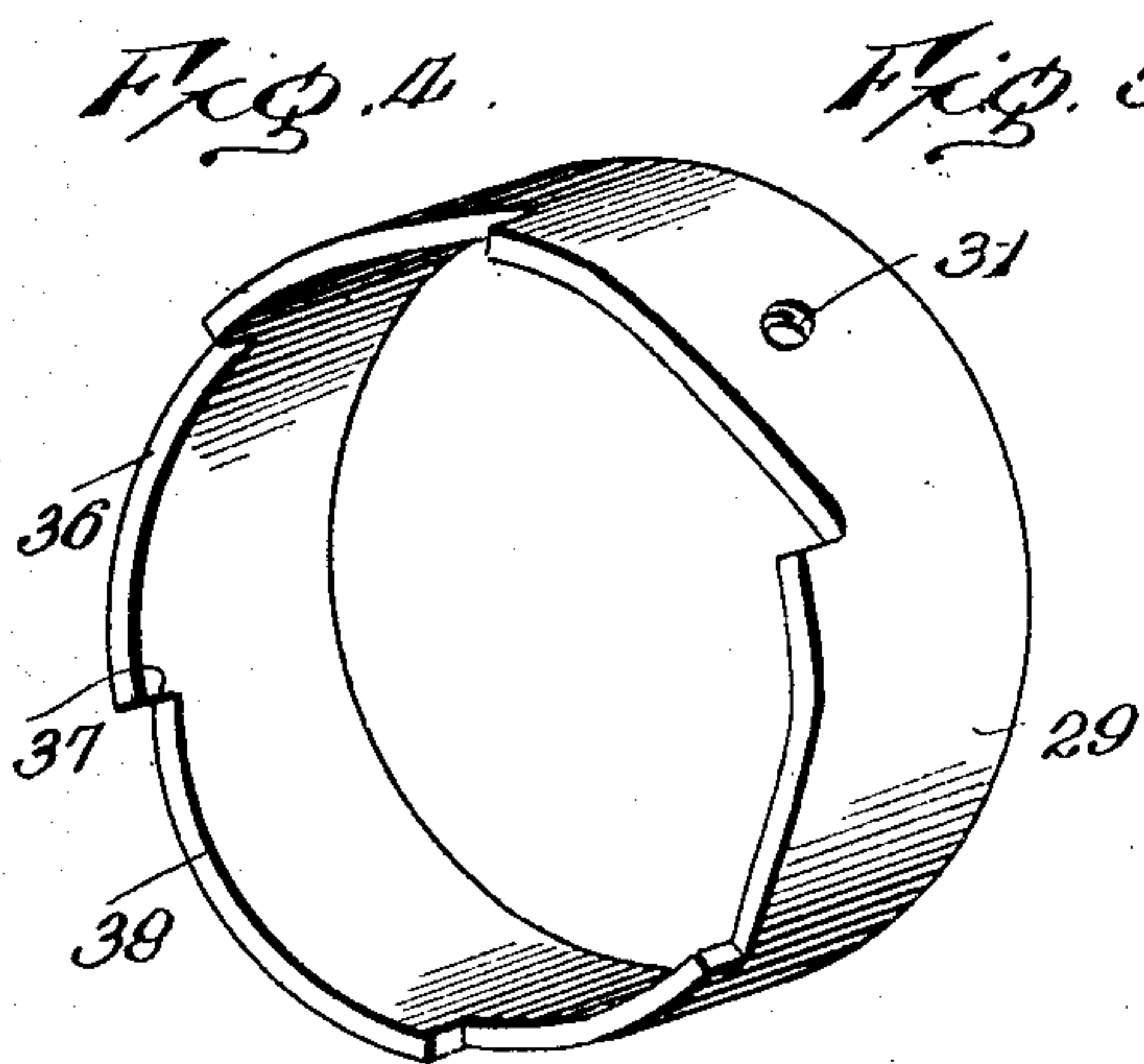
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2 SHEETS—SHEET 2.



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DROP-HAMMER.

No. 916,231.

Specification of Letters Patent.

Patented March 23, 1909.

Application filed October 31, 1907. Serial No. 400,040.

To all whom it may concern:

Be it known that I, JOHN W. WAGNER, a citizen of the United States, residing at Marietta, in the county of Washington and State of Ohio, have invented certain new and useful Improvements in Drop-Hammers, of which the following is a specification, reference being had therein to the accompanying drawing.

My invention relates to improvements in drop hammers.

The object of my invention is to provide a drop hammer of the character hereinafter set forth, in which the length and rapidity of the stroke of the hammer can be readily changed or varied, thus giving a long or a short quick stroke to the hammer as is desired.

Another object of my invention is to provide a hammer of this character in which the hammer is automatically dropped, and in which said drop can be changed to give a long or a short stroke, or in which the drop can be regulated by hand or foot, as desired.

A still further object of my invention is to provide a more simple, cheap and effective hammer to accomplish the above mentioned objects.

In the accompanying drawings, Figure 1, is a front elevation of my improved hammer. Fig. 2, is a vertical, sectional view taken on the line 2—2 of Fig. 1. Fig. 3, is a perspective view of the shaft-supporting bracket and the clutch-operating lever and its connecting parts. Fig. 4, is a perspective view of the loose band. Fig. 5, is an enlarged, horizontal, sectional view showing another means for operating the drive shaft. Fig. 6, is an enlarged, perspective view of the belt, showing its connecting means with the loose band. Fig. 7, is an enlarged perspective view of the rigid pulley carried by the operating shaft. Fig. 8, is an enlarged side elevation of the rigid pulley and the loose band and clutch mechanism, showing the belt connected thereto.

Referring now to the drawings, 1 represents a base which is made of any desired form, but preferably of a broad, flat form to form a solid base to hold the hammer in an upright position and prevent the same from tilting. Secured to said base in any desired manner are the two upwardly extending standards 2 and 3 which slightly converge toward their upper ends, and are connected at their extreme upper ends by the trans-

verse beam 4. Secured to one side of said standards below the transverse beam is an enlarged plate 5 which more rigidly connects the upper end of the standards, and also forms a guide for the hammer to prevent it from turning, as will be hereinafter more fully described.

The transverse beam 4 is provided with a guide 6 through which passes the hammer shaft 8 which also passes through a guide 9 carried by the lower end of the plate 5. The shaft 8 at its lower end is provided with a clutch 10 held thereon by a set screw 11, and into which the hammer 12 is secured by a set screw 13, and by means of which a hammer of any desired character may be placed in the clutch, according to the character of work to be done.

The base 1 below the hammer is provided with an anvil or vise 14 which is braced by attaching the bolt 15 to the transverse brace 16 carried by the upright standards 2 and 3, and said brace further strengthens the standards.

The standards 2 and 3 on the opposite sides are provided with brackets 17 and 18 which are located at a point below the lower edge of the plate 5, and mounted in the upper edge of said brackets is a shaft 19 which is provided at its outer end with a pulley 20 by means of which the shaft may be driven by a belt. The said pulley is provided with a crank 21 by means of which the hammer may be operated by hand when desired. The opposite end of the shaft is provided with a ratchet wheel 22, and carried by the standard 2 is a pawl 23 engaging the ratchet disk and whereby the shaft 19 is prevented from being rotated in but one direction.

The shaft 19 intermediate the brackets 17 and 18 is provided with a pulley wheel 24 which is keyed upon the shaft by means of the set screw 25. The said pulley wheel is provided with the outer flat bearing surface 26, while one edge at opposite sides is provided with the outwardly-turned flanges 27 and 28. Loosely surrounding the outer flat surface 26 of the pulley 24 is the band 29, and the flanges or ears 27 and 28 prevent said band from sliding therefrom in one direction. Secured to the inner periphery of the pulley are L-shaped members 30 which extend outwardly beyond the periphery of the pulley and prevent the band 29 from sliding from the pulley in the opposite direction. By

this arrangement it will be seen that the band 29 is free to rotate upon the periphery of the pulley.

The band 29 is provided with a screw-threaded opening 31, and passing around the band is a strap 32 provided with a series of openings 33. A V-shaped wire loop 34 is provided through which passes the screw 35, said screw passing through one of the openings 33 in the belt and screwed into the screw-threaded opening 31 in the loose band. The belt 32 passes around the band and through the enlarged end of the wire loop 34, whereby the strain of the belt is prevented from being unwound beyond a certain point. The band or cuff 29 has one edge provided with notches 36 which are provided with the beveled faces 37 and the straight faces 38, all of which will be hereinafter more fully described.

The plate 5 at its upper end is cut away, as indicated at 39 above, and above said cut-away portion are journals 40 in which is mounted a drum 41 over which the belt passes, and said belt passes down and is permanently connected to a loop 42 carried by the block 43 which is of a broad form and moves up and down against the plate 5. The journals 40, as above shown, are mounted upon the standards 2 and 3 between the plate 5 and the beam 4. The said block 43 is clamped to the hammer shaft 8 by means of the clip 44, and screws 45, and thus it will be seen that the block 43 riding against the plate 5 prevents any oscillation of the hammer shaft.

The shaft 19 has loosely mounted thereon a sleeve 46 which is held upon the shaft by a key 46' so as to have a longitudinal movement, yet held against rotation. The outer end of said sleeve is provided with an annular recess 47, and loosely surrounding the sleeve within the recess is a yoke 48, the lower end of which is secured to a block 49 carried by the upper end of the spring arm 50. The said spring arm has its lower end connected to the beam 3 in a rigid manner, whereby the spring arm through the yoke is at all times holding the sleeve in its inward position. The sleeve at its inner end is provided with a rigid outwardly-extending stud 51 which normally bears against one end of the pulley, as shown in Figs. 5 and 8. The said stud enters the notches 36 in the loose band, and is adapted to lock the same to the shaft 19 to cause the rotation of the same with the pulley, and whereby the band is rotated for winding the belt thereon for raising the hammer.

Secured to the inner periphery of the pulley 26 by means of screws 52 are the cam plates 53 and 54. The cam plate 54 has an opening 55 through which the stud 51 passes, the said opening being of a length to allow the stud to have the proper movement with the sleeve. The cam plates have cam surfaces 56 which, when carried around with

the pulley by the rotation of the shaft, operate the stud 51. Said cam surface is so positioned that it engages the spring arm 50 forces the same outwardly toward the beam 3 drawing the stud 51 out of the notch in the band, allowing it to freely rotate on the pulley.

Connected to the arm 50 is a rod 57 which extends through the bracket 18, and is connected to an angle iron 58 carried by the plate 59. The said plate 59 is pivotally connected at its lower end to an angle iron 60 which is riveted to the bracket 18. Pivotally connected to the upper end of the plate 59 is a rod 60' which extends down and is pivoted to a foot lever 61 intermediate its ends. Carried by the base 1 is a catch 62 under which the foot lever 61 is adapted to spring, and by means of which the lever is held in a downward position.

In order to drive the shaft 19 from an engine and at the same time provide means for allowing the engine to continue to run and disengage the belt from the shaft 19 so that it will not be rotated, I provide a pulley 64 keyed to said shaft 19 and having the flanges 65 as shown. Loosely mounted on the periphery of the pulley is a band 66, and flanges 65 preventing the band from sliding off the pulley, but at the same time allowing the band to freely rotate thereon. The outer face of the band 66 is provided with ratchet teeth 67 into which a clutch 68 is adapted to catch and lock the band to the pulley. The clutch, as shown, is slidably mounted upon the shaft 19 as indicated at 69, and said clutch is held in the position shown by the spring 70. The said spring is operated by a foot or hand lever 71 constructed and arranged the same as the lever 61, whereby the loose band may be locked to the pulley. Passing around the band is a belt 72 which passes to the engine and is driven thereby, and whereby by operating the lever 71 the shaft 19 may be rotated at will without affecting the engine.

The operation of the device is as follows: The shaft 19 is rotated either by the pulley 20 or the crank 21, which in turn rotates the sleeve 46, and the stud 51 is locked in one of the notches 36 of the band 29, whereby the band is rotated and the belt 32 is wound thereon. When the cam plate 54 comes in a downward position it engages the spring arm 50 forcing the same outwardly, carrying with it the yoke which in turn carries the sleeve and causes the stud 51 to draw from the notches or notch of the band, releasing the same and causing the weight of the hammer shaft and hammer to draw the trap 32, and allowing the band to freely rotate on the pulley, allowing the hammer to drop. By the time the hammer has dropped the cam has released the spring arm, which in turn throws the stud 51 into another notch of the band, and the

same is again rotated. The cam plates may be any in number, thus increasing or decreasing the length of the throw of the hammer. I have shown the cam plates which allow the
5 band to be released twice during each revolution of the shaft or pulley.

In order to trip the hammer at any desired height the lever 61 is depressed, which draws the rod 57 outwardly, which in turn draws
10 the spring arm 50 outwardly, drawing the sleeve outwardly causing the sleeve to release the stud from the band, and thus allowing the hammer to be released at any desired time.

15 The frame of the hammer is provided with rearwardly-extending spring arms 72 between which is mounted the roller 73 which is adapted to bear against the inner face of the belt 32 to keep the same stretched and to cushion
20 the jar on the ratchets when the hammer head drops.

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

25 1. A drop hammer comprising a vertical frame, a shaft carried by the frame, a pulley rigidly carried by the shaft, a band mounted upon the periphery of the pulley, a hammer vertically movable in the frame and a belt
30 connecting the hammer and the band, said band having notches in one side, a clutch member slidable upon the shaft and adapted to enter the notches in the band, and a cam plate carried by the pulley for throwing the
35 clutch out of the notches in the band.

2. A drop hammer comprising a vertical frame, a shaft carried by the frame, a pulley rigidly carried by the shaft, a band loosely mounted upon the periphery of the pulley, a
40 hammer vertically movable in the frame, a belt connecting the band and hammer, said band having notches in one side, a clutch member slidable upon the shaft, a spring carried by the frame, and having its upper
45 end connected to the clutch and normally holding the same in the notches in the band, and a cam plate carried by the pulley for engaging the spring for disengaging the clutch from the notches in the band.

50 3. A drop hammer comprising a vertical frame, a hammer slidably mounted in the frame, a belt supporting said hammer, a shaft rotatably mounted in the frame, a pulley keyed upon said shaft, a band loosely mounted
55 upon the periphery of the pulley, and having the belt connected thereto, said band having notches in one side, a clutch slidably mounted upon the shaft and adapted to interlock with the notches in the band, and means for
60 sliding said clutch whereby the clutch locks or unlocks the band to the shaft.

4. A drop hammer comprising a vertical frame, a hammer slidably mounted in the frame, a belt supporting said hammer, a
65 shaft rotatably mounted in the frame, a pul-

ley keyed upon the shaft, a band loosely mounted upon the periphery of the pulley and having the belt connected thereto, said band having notches in one edge, a clutch
70 slidably mounted upon the shaft and adapted to interlock with the notches in the edge of the band, and means carried by the pulley for operating said clutch.

5. A drop hammer comprising a frame, a hammer slidably mounted therein, a belt
75 supporting said hammer, a shaft rotatably mounted in the frame, a pulley keyed upon the shaft, a band loosely mounted upon the periphery of the pulley and having the belt connected thereto, said band having notches
80 in one edge, a sleeve slidably mounted upon the shaft, and having a radially-extending stud adapted to engage the notches of the band, a spring normally holding the sleeve in its inward position, means for operating said
85 sleeve, and cam plates carried by the pulley for operating the sleeve operating means, whereby the band is released and adapted to rotate or oscillate freely upon the pulley.

6. A drop hammer comprising a frame, a
90 hammer slidably mounted therein, a belt supporting said hammer, a shaft rotatably mounted in the frame, a pulley keyed upon the shaft, means for rotating the shaft, a
band loosely mounted upon the outer periphery of the pulley, said band having
95 notches in one edge, a sleeve slidably mounted upon the shaft adjacent the pulley, a stud carried by the sleeve and adapted to enter the notches in the band, a spring rigidly secured to the frame and having a yoke
100 within a groove in the sleeve, and normally holding the sleeve in its inward position, and plates carried by the pulley for engaging the spring and forcing the sleeve outwardly and
105 releasing the band.

7. A drop hammer comprising a frame, a hammer slidably mounted therein, a belt supporting said hammer, a shaft rotatably
110 mounted in the frame, a pulley keyed upon the shaft, a band loosely mounted upon the outer periphery of the pulley, said band having notches in one edge, a sleeve slidably mounted upon the shaft adjacent the pulley,
115 a stud carried by the sleeve and adapted to enter the notches in the band, a spring rigidly secured to the frame, and connected to the sleeve, and normally holding the sleeve in its inward position, and plates carried by the pulley for engaging the spring and forcing
120 the sleeve outwardly and releasing the band, a second pulley keyed upon the shaft, a band loosely mounted upon the shaft, a clutch for locking the band on the pulley, a foot or hand lever for operating the clutch,
125 and a belt passing around the loose band and driven to the engine.

8. A drop hammer comprising a frame, a hammer slidably mounted therein, a belt
130 supporting said hammer, a shaft rotatably

mounted in the frame, a pulley keyed upon
the shaft, a band loosely mounted upon the
periphery of the pulley, ears carried by the
pulley to prevent the lateral movement of
5 the band thereon, the band having notches
in one edge, a sleeve slidably mounted upon
the shaft adjacent the pulley, a stud carried
by the sleeve and adapted to enter the
notches in the band, a spring rigidly secured
10 to the frame a yoke carried by the upper end
of the spring and resting in a groove in the
sleeve, said spring normally holding the
sleeve inwardly with the stud in the notches

in the band and a wedge-shaped plate carried
by the side of the pulley and engaging the 15
spring during the rotation of the pulley and
forcing the sleeve outwardly moving the arm
out of the notches in the band and releasing
said band.

In testimony whereof I affix my signature 20
in presence of two witnesses.

JOHN W. WAGNER.

Witnesses:

CHAS. H. NIXON,

CHAS. H. DANFORD.