

No. 756,390.

PATENTED APR. 5, 1904.

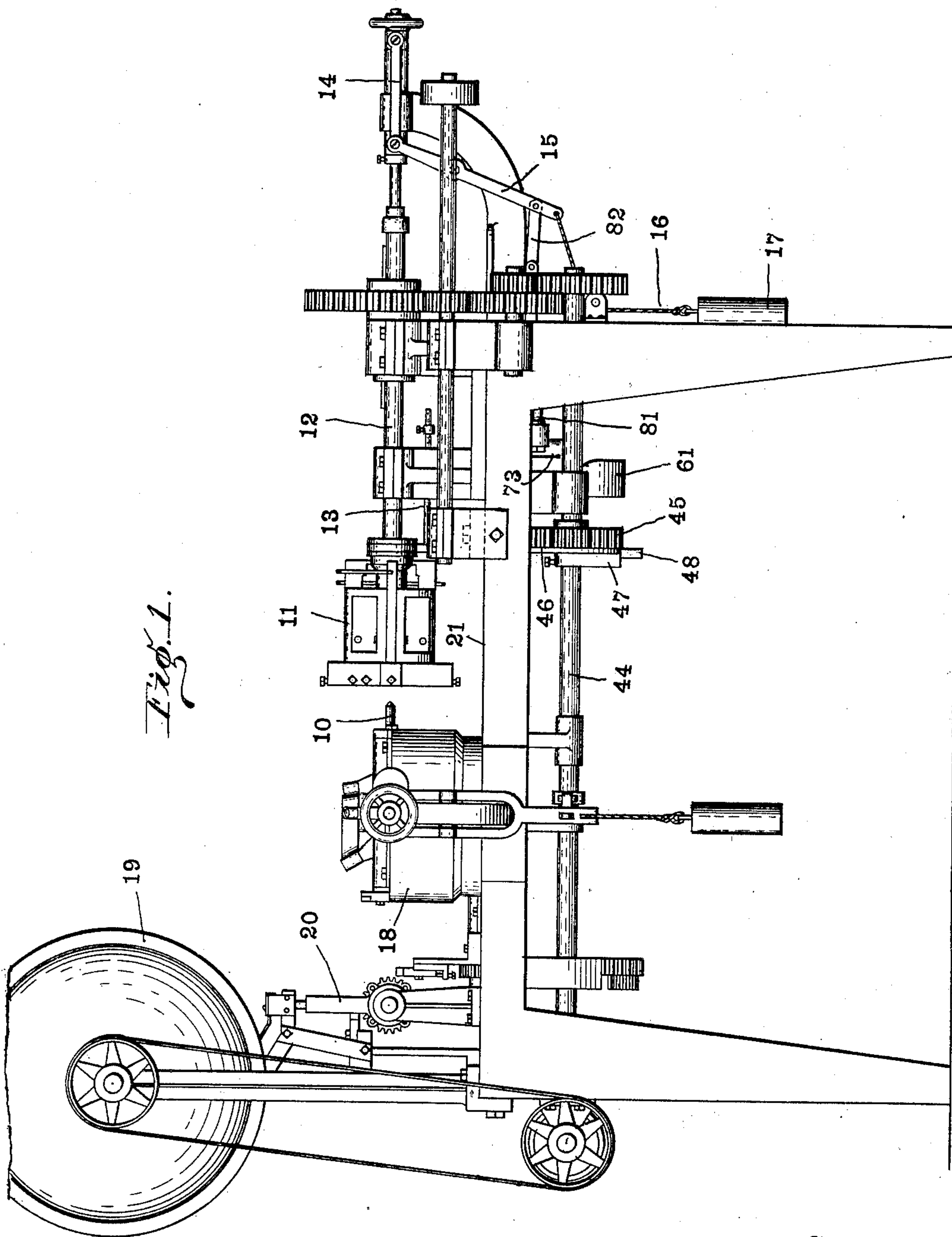
C. R. MOON.

CLUTCH.

APPLICATION FILED JULY 13, 1903.

NO MODEL.

4 SHEETS—SHEET 1.



Witnesses
Frank A. Fable
J. A. Walcott

Inventor
Charles R. Moon
By *Bradford V. Hood*
Attorneys

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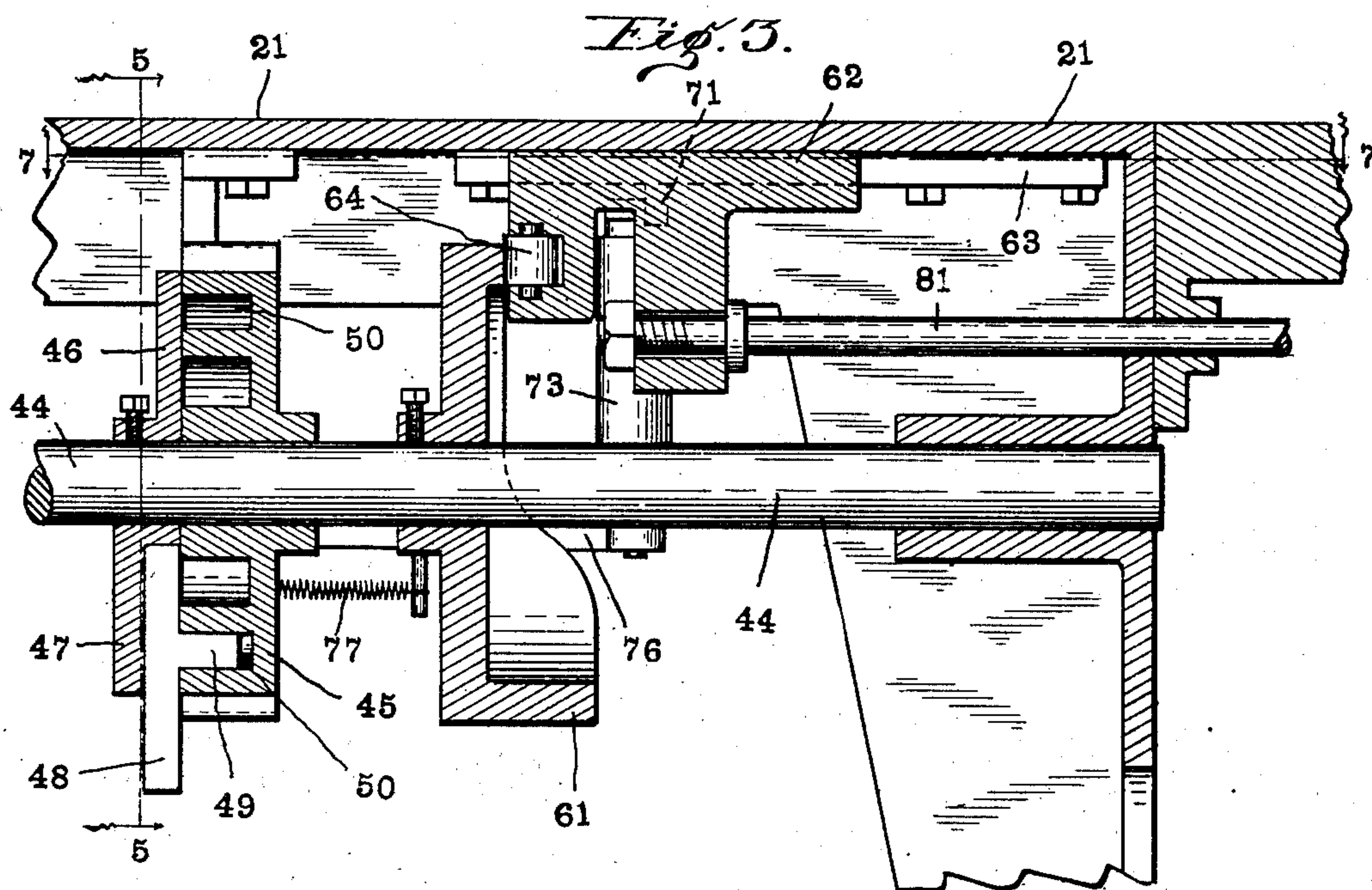
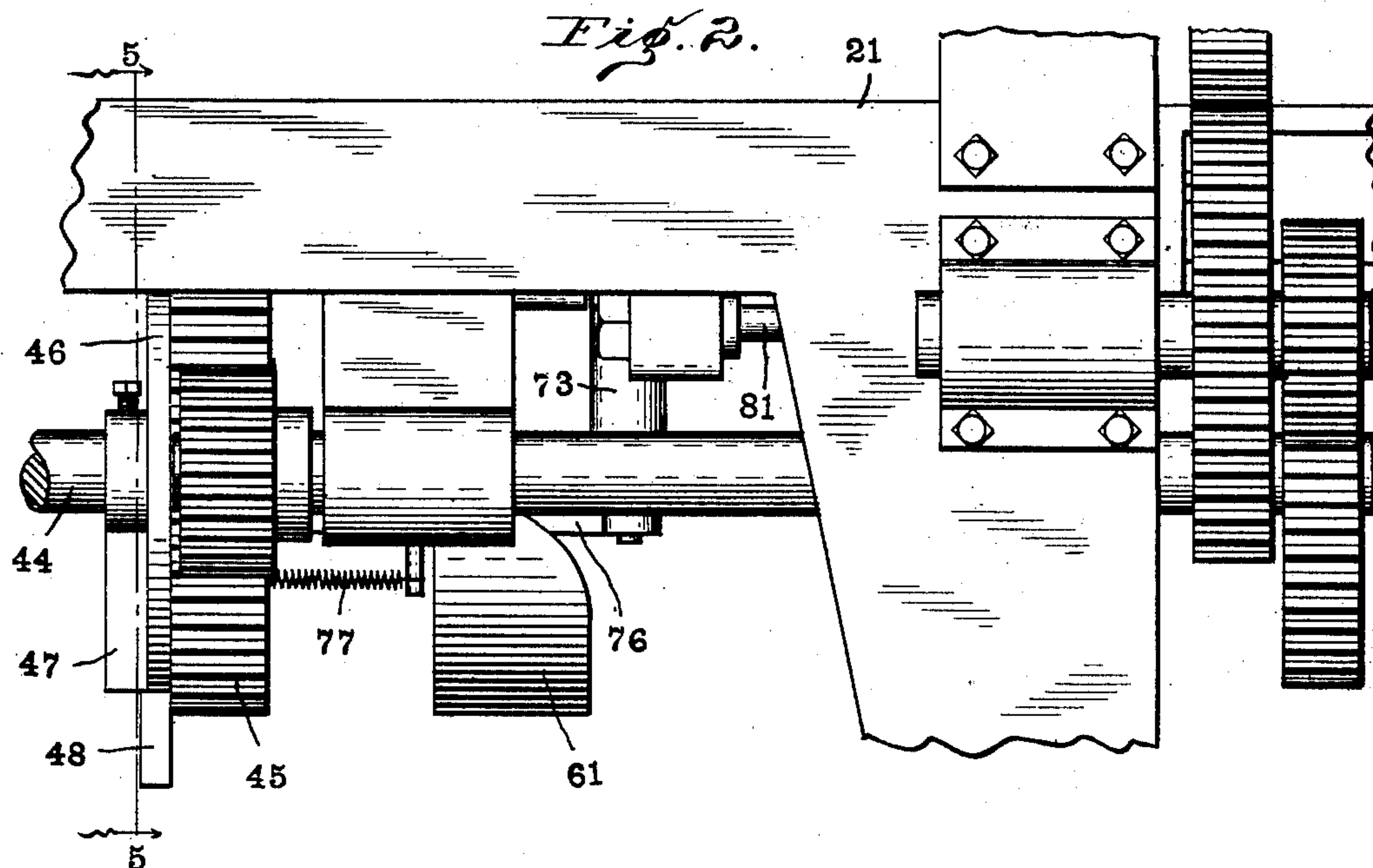
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4 SHEETS—SHEET 3.

Fig. 4.

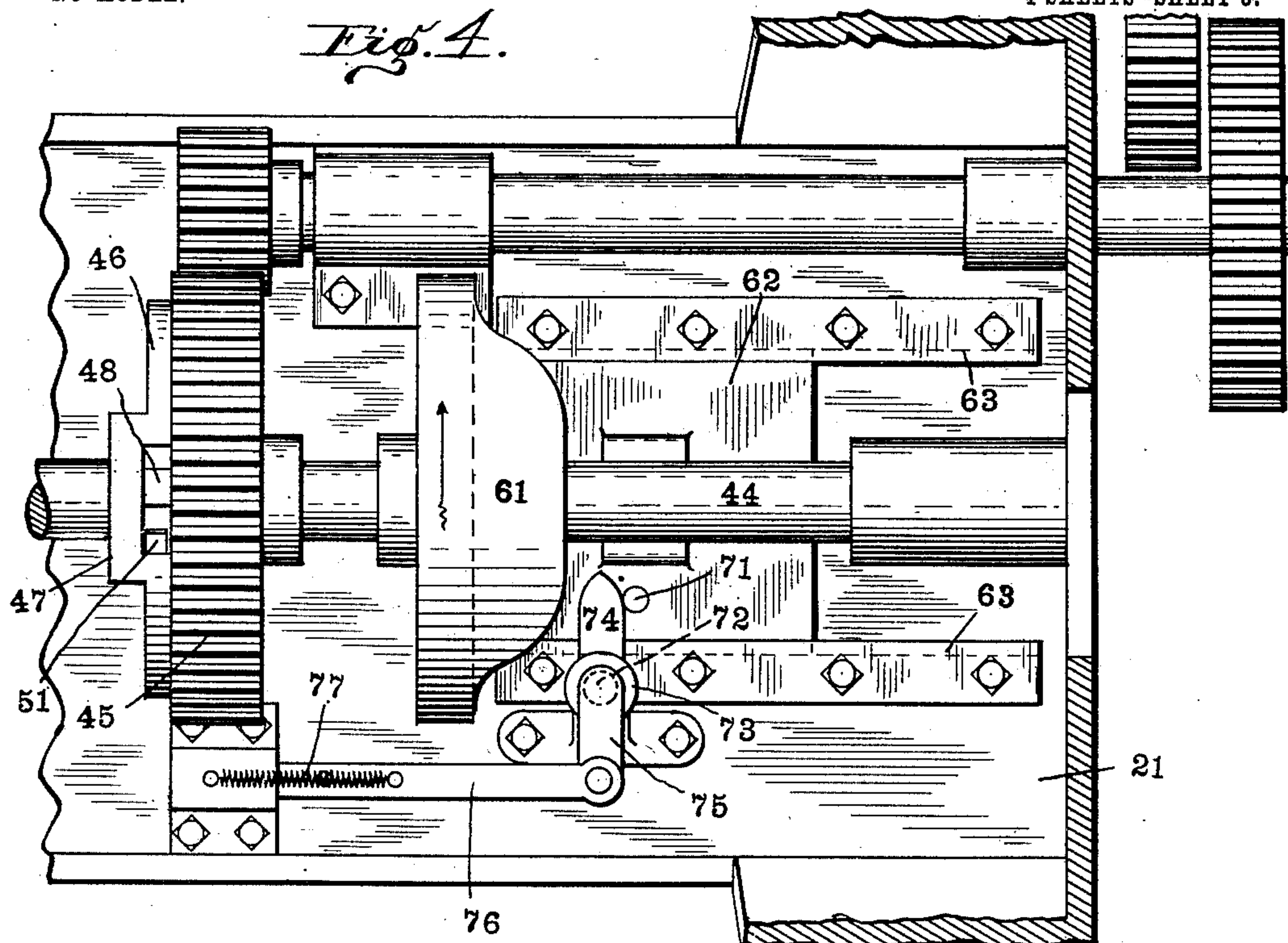
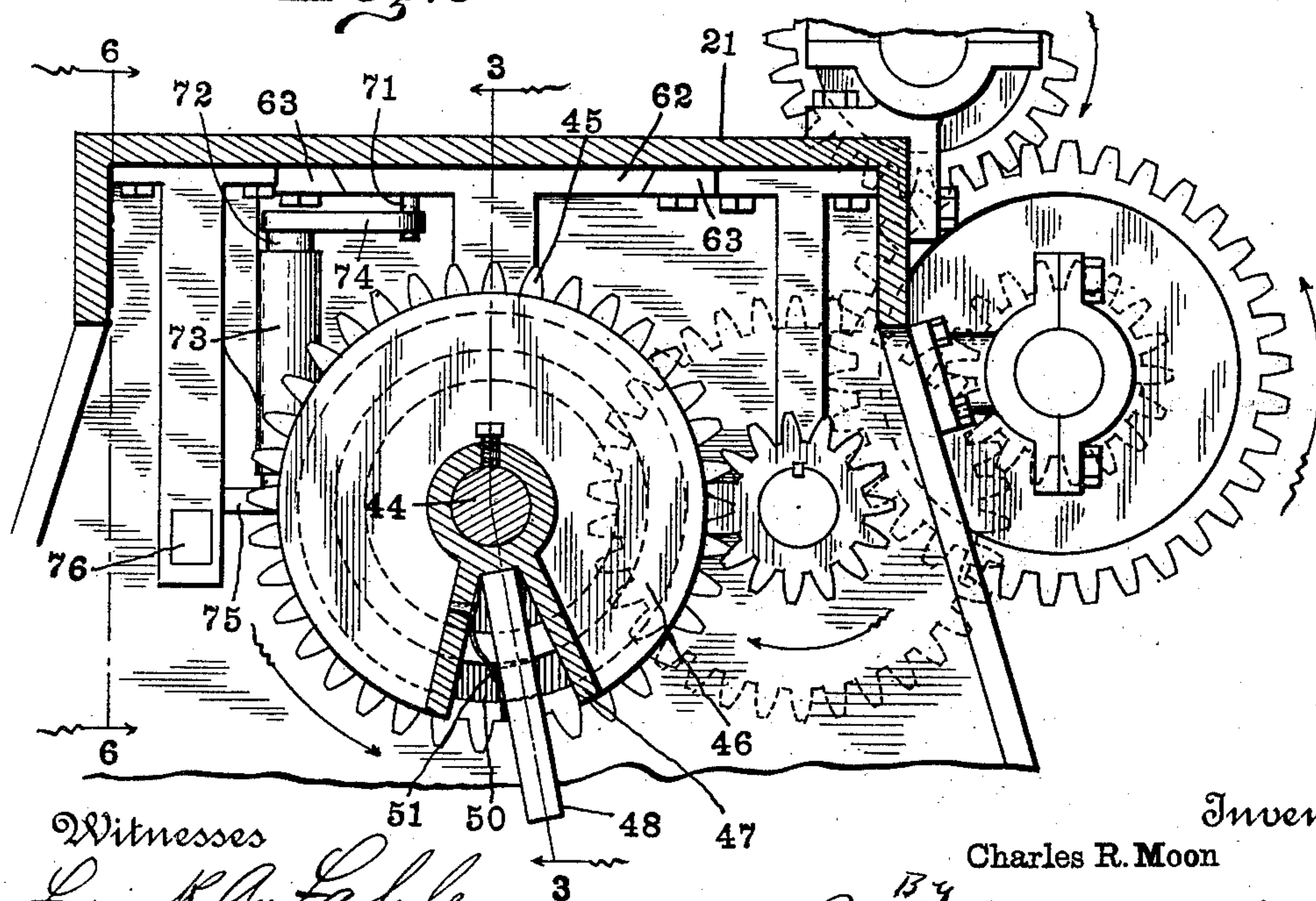


Fig. 5.



Witnesses

Frank A. Fable
J. A. Walsh

Inventor

Charles R. Moon

By
Bradford T. Hood,
Attorneys

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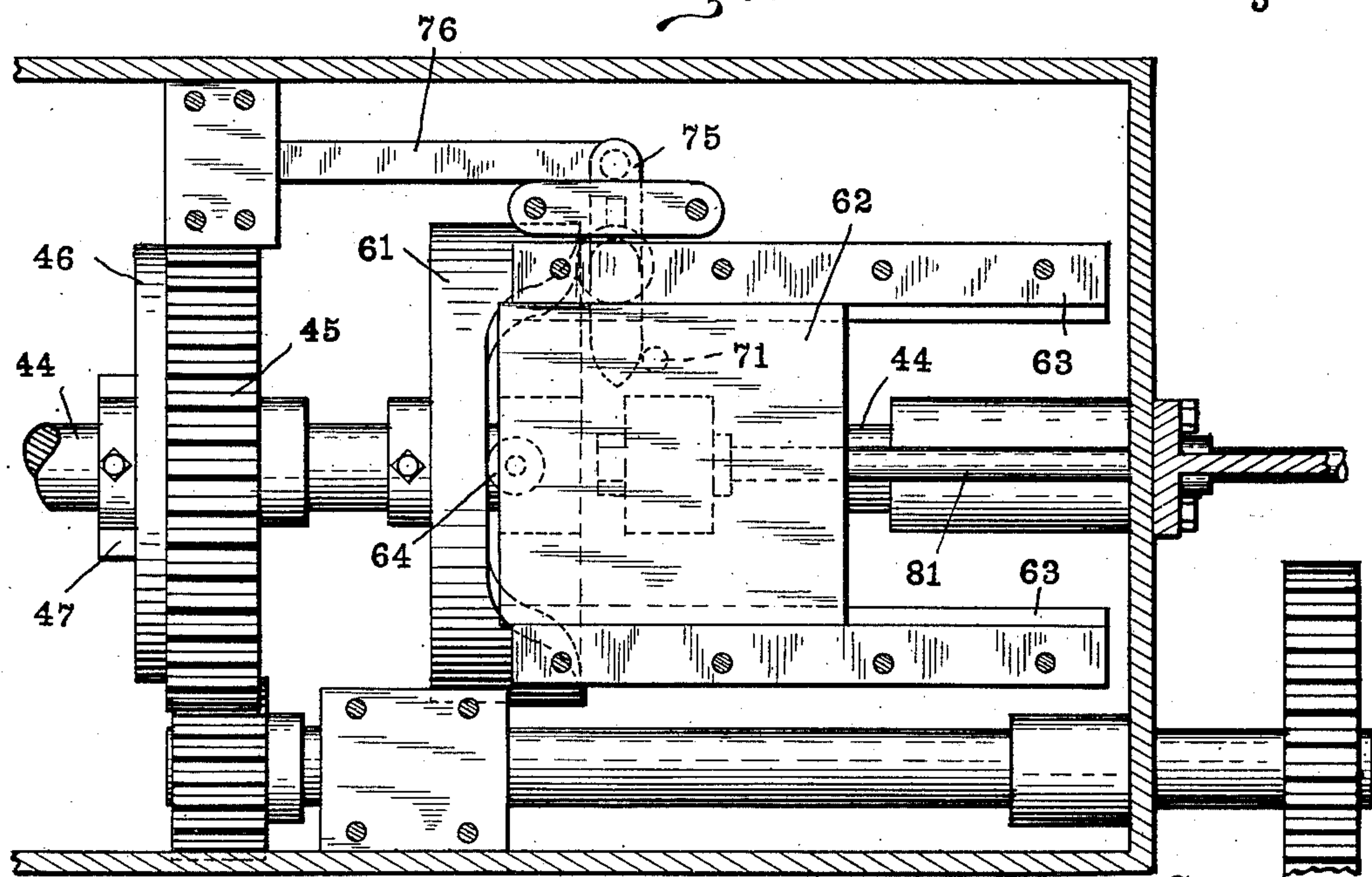
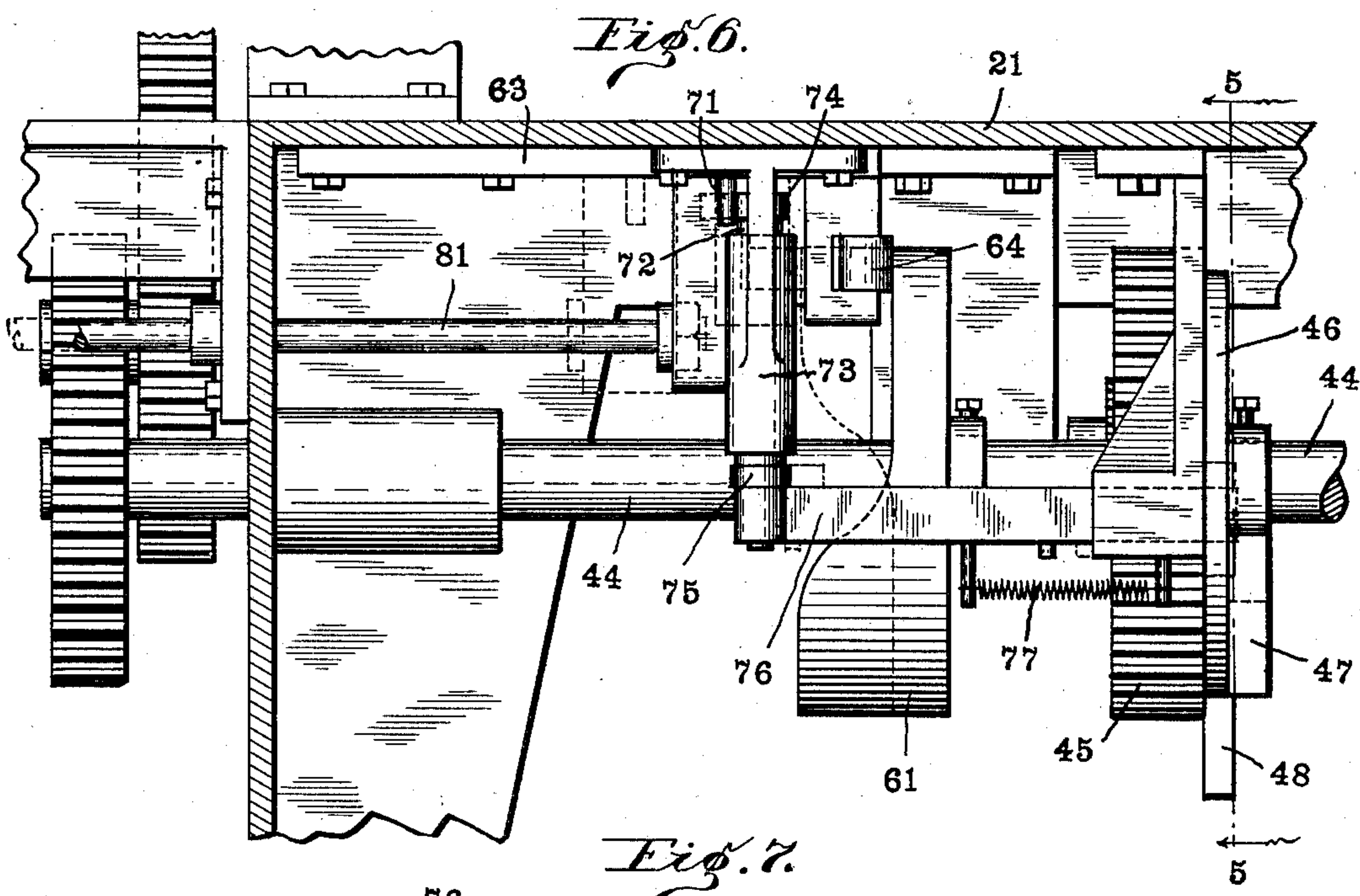
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4 SHEETS—SHEET 4.



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Frank A. Fable
J. A. Walsh

Inventor
Charles R. Moon
By *Bradford & Hood,*
Attorneys

UNITED STATES PATENT OFFICE.

CHARLES R. MOON, OF MUNCIE, INDIANA.

CLUTCH.

SPECIFICATION forming part of Letters Patent No. 756,390, dated April 5, 1904.

Application filed July 13, 1903. Serial No. 165,347. (No model.)

To all whom it may concern:

Be it known that I, CHARLES R. MOON, a citizen of the United States, residing at Muncie, in the county of Delaware and State of Indiana, have invented certain new and useful Improvements in Clutches, of which the following is a specification.

The object of my present invention is to provide a clutch by means of which correlated mechanism in train therewith may be intermittingly driven and which shall be so connected to the operating devices which immediately do the work which the machine in which my clutch is embodied is designed to perform as that the rapidity of its movement may be caused to depend upon the presence or absence of work at said operating devices.

The construction and arrangement illustrated is suitable to an automatic bolt-threading machine, such as is shown and described in my pending application, Serial No. 163,929, to which reference may be made for a more complete understanding of such a machine.

Referring to the accompanying drawings, which are made a part hereof, and in which similar reference characters indicate similar parts, Figure 1 is a side elevation of a bolt-threading machine of the character above mentioned equipped with a clutch embodying my present invention; Fig. 2, a side elevation of said clutch and the immediately adjacent portions of the machine, including the gear-train through which it operates, this view being similar to a portion of Fig. 1, but on an enlarged scale; Fig. 3, a central vertical sectional view through the clutch and immediately adjacent parts as seen when looking in the direction indicated by the arrows from the dotted line 3 3 in Fig. 5; Fig. 4, an under side plan of the same; Fig. 5, a transverse vertical sectional view as seen when looking in the direction indicated by the arrows from the dotted lines 5 5 in Figs. 2, 3, and 6, respectively; Fig. 6, a rear elevation of the clutch and immediately adjacent parts, the framework in which the same is mounted being shown in section at the point indicated by the dotted lines 6 6 in Fig. 5; and Fig. 7, a plan view of the mechanism as seen when looking downwardly from the dotted line 7 7 in Fig. 3.

On these several views the direction of rotation of the revolving parts is indicated by curved arrows arranged upon or near the peripheries of such parts.

Upon the shaft 44 is loosely mounted a gear-wheel 45. Alongside said gear-wheel and rigidly mounted upon said shaft is a disk 46, which embodies a suitable housing 47, within which is a clutch-arm 48, carrying a clutch-finger 49, the latter of which extends into an annular groove 50 in the adjacent face of the gear 45. The form of this finger is such that it will normally (by reason of its own weight alone or aided by spring 51) engage with and impinge upon the walls of groove 50 in gear 45, so that the latter will operate to drive the shaft 44. There is also fixedly mounted upon the shaft 44 a cam-wheel 61, which is adapted to engage with and operate a slide 62, mounted in suitable ways 63 on the under side of the table 21 of the framework, an anti-friction-roller 64 being commonly provided at the point of immediate contact. Extending downwardly from the slide 62 is a projection 71. A rock-shaft 72 is mounted in a suitable bearing 73, carried by the frame of the machine at a point adjacent thereto, and said shaft 72 has an arm 74, which extends into the path of the projection 71. This shaft 72 also has an arm 75 on its lower end, and attached to this arm 75 is a reciprocating bar 76, which is adapted to be projected into the path of the clutch-arm 48. A suitable impelling device, as tension-spring 77, operates to project said reciprocating bar 76 into the path of the arm 48 when said arm is not held back by the projection 71 on the reciprocating slide 62. As the shaft 44 revolves the cam 61 comes in contact with the slide 62 at each revolution, and consequently moves said slide to a point which carries the projection 71 away from the arm 74, thus permitting the rock-shaft 72 to be moved by the pull of the spring 77, projecting the bar 76 into the path of clutch-arm 48. If the bar 76 is held forward into this position until the arm 48 reaches it, the result is that said arm 48 is thrown back slightly, disengaging the finger 47 from the walls of the groove 50, thus permitting the gear 45 to revolve loosely on the shaft 44 with-

out imparting any motion to said shaft, so that as long as the slide 62 is held to the position to which it has been moved by the operation of cam 61 the shaft 44 will remain at rest.

5 In many mechanical operations the speed with which the operations can be made to succeed each other is an important factor. If (in an automatic machine) the pause at the operation-point must always be long enough to
10 permit the machine to perform the operation, much time will be lost compared with a condition where the pause, if any, in case the machine is empty is but momentary. I have therefore provided means governed by the operating devices which determine the period
15 during which the clutch shall remain disengaged, as above described, and consequently the period during which the shaft 44 shall remain at rest and the operations which are dependent thereon shall cease.

In the present instance, as hereinbefore indicated, I have shown my invention in connection with a bolt-threading machine, in which the bolt 10, which is to be operated
25 upon, is held by a suitable chuck, which is non-moving in respect to the base on which it is mounted, except such rotary movement as is necessary to bring the individual pieces of work (bolts) carried thereby successively into
30 position to be operated upon. Alongside this chuck adjacent to the bolt upon which the threading operation is to be performed I show a threading-head 11, carried by a longitudinally-reciprocating spindle 12, and I have
35 shown usual devices, as the rod 13 and stops thereon, for operating the jaws of the threading-head. All these are shown and thus briefly described merely by way of illustration, as I design to use my said clutch in connection
40 with any operating devices with which it is suitable to be employed. The spindle 12, carrying the operating device, is normally held in retracted position through a link 14, lever 15, and cord 16 by a weight 17, all of which are
45 simple mechanical devices and which will be readily understood. Connected, however, to these spindle-operating means is a rod 81, which is connected to the reciprocating slide 62, the connection being made in the present
50 instance by means of a link 82, pivoted to said rod and to the lever 15. Thus when the cam 61 acts to move the slide 62 the result is to throw forward the spindle 12, carrying the threading-head 11, which head if a bolt 10 is
55 present in the proper position to be operated upon will engage with said bolt. This engagement of the operating device with the article upon which the operation is to be performed is sufficient to hold the spindle forward until the operation has been completed and engagement between the operating device, and the article being operated upon released, after which of course the weight 17
60 will operate in the usual manner to retract the spindle; but while the operating device

and the article being operated upon are in engagement the slide 62 is necessarily held to the position to which it has been moved by the cam 61 and the impelling means 77 is free
70 to hold the bar 76 forward into the path of the clutch-arm 48 and hold the finger carried by said arm disengaged from the groove 50 in the gear 45. So long as these parts are thus held the shaft 44 will remain at rest; but as soon as the slide 62 moves back, which it
75 will do as soon as the engagement between the operating devices and the work being operated upon is released, the clutching is resumed and the shaft 44 is again driven forward. The parts may be so arranged as that when
80 the machine is empty of work the cam 61 will operate the slide 62 at a time when the clutch-arm 48 is at a little distance from the bar 76, and when this is the arrangement no cessation of the movement of the shaft 44 will be caused
85 at all; but said movement will be continuous, and the time which would otherwise be lost, being the period of complete operation of the device, is all or nearly all saved, as the automatic mechanism driven by the shaft 44 will
90 proceed continuously instead of there being a period of cessation of movement. It will of course be understood that the shaft 44 drives the work-supplying mechanism.

The machine which is illustrated includes, 95 as well as the parts which have been referred to, a work-holding chuck 18, a feed-hopper 19, and transferring mechanism 20, by means of which the articles to be operated upon are transferred from the hopper to the chuck; but
100 these, like many of the other parts referred to, are shown by way of illustration only and form no part of my present invention.

Having thus fully described my said invention, what I claim as new, and desire to secure 105 by Letters Patent, is—

1. The combination, with an automatic machine, of a shaft for driving the work-supplying mechanism, a clutch mounted on said shaft, and means connecting said clutch with the operating devices of the machine, said operating devices being arranged to control said means whereby the clutch is held disengaged during the performing of the operation, and operated to be reengaged when the machine is
110 empty, substantially as set forth.

2. The combination of a shaft, a continuously-driven gear loosely mounted thereon, a clutch member arranged alongside said gear and rigidly mounted on said shaft, a clutch-arm carrying a finger adapted to engage with an annular groove in said gear, whereby said shaft is normally propelled, a cam also on said shaft, and devices controlled by said cam adapted to be projected into the path of the
120 clutch-arm, whereby the clutch is disengaged and the shaft permitted to remain at rest.

3. The combination of a shaft, a two-part clutch mounted thereon, one member being loosely and the other fixedly mounted, engag- 130

ing means whereby the two members can be
clutched together, means for projecting a bar
into the path of the clutching device, means
governed by the operating devices of the ma-
chine for causing these parts to remain in en-
5 gagement during the time the work is being
performed, and means operated by the same
shaft for withdrawing said bar from the path
of the clutching device at the proper time.
10 4. The combination of a shaft, gear loosely
mounted thereon and forming one member of
a clutch, a second clutch member rigidly
mounted on said shaft, a cam also rigidly
mounted on said shaft, a slide mounted on the
15 frame adjacent to said cam and adapted to be
operated thereby, an operating-head, a spin-

dle on which said operating-head is mounted,
connections between said slide and said spin-
dle, a bar adapted to be projected into the
path of the clutch-arm, impelling means nor- 20
mally tending to cause such engagement, and
connections between said bar and the slide
whereby the said bar is normally held out of
engagement with the clutch-arm and against
the force of said impelling means. 25

In witness whereof I have hereunto set my
hand and seal, at Muncie, Indiana, this 9th day
of July, A. D. 1903.

CHARLES R. MOON. [L. s.]

Witnesses:

CHARLES B. ATHERTON,

CLEMENT H. WINCHESTER.