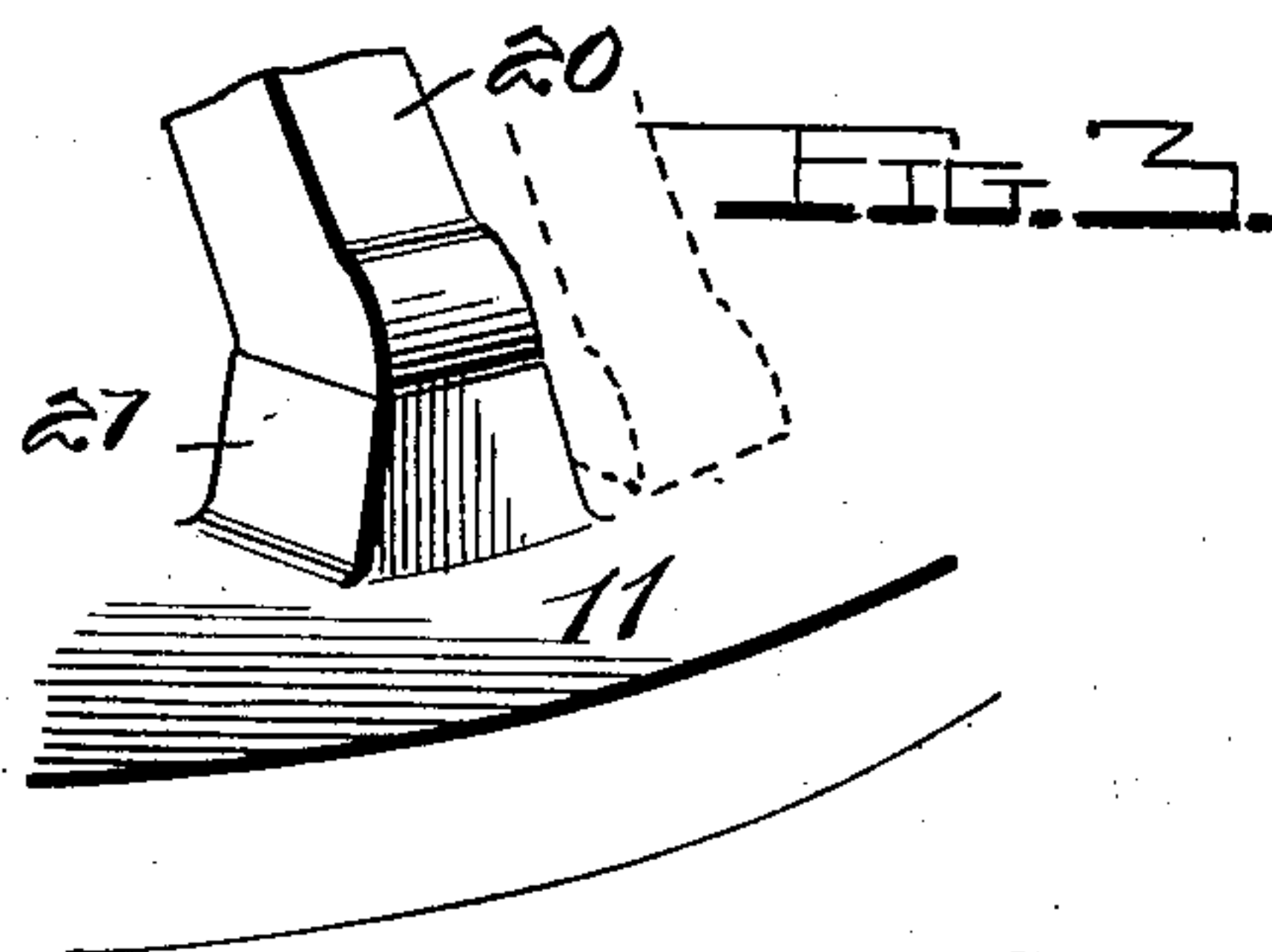
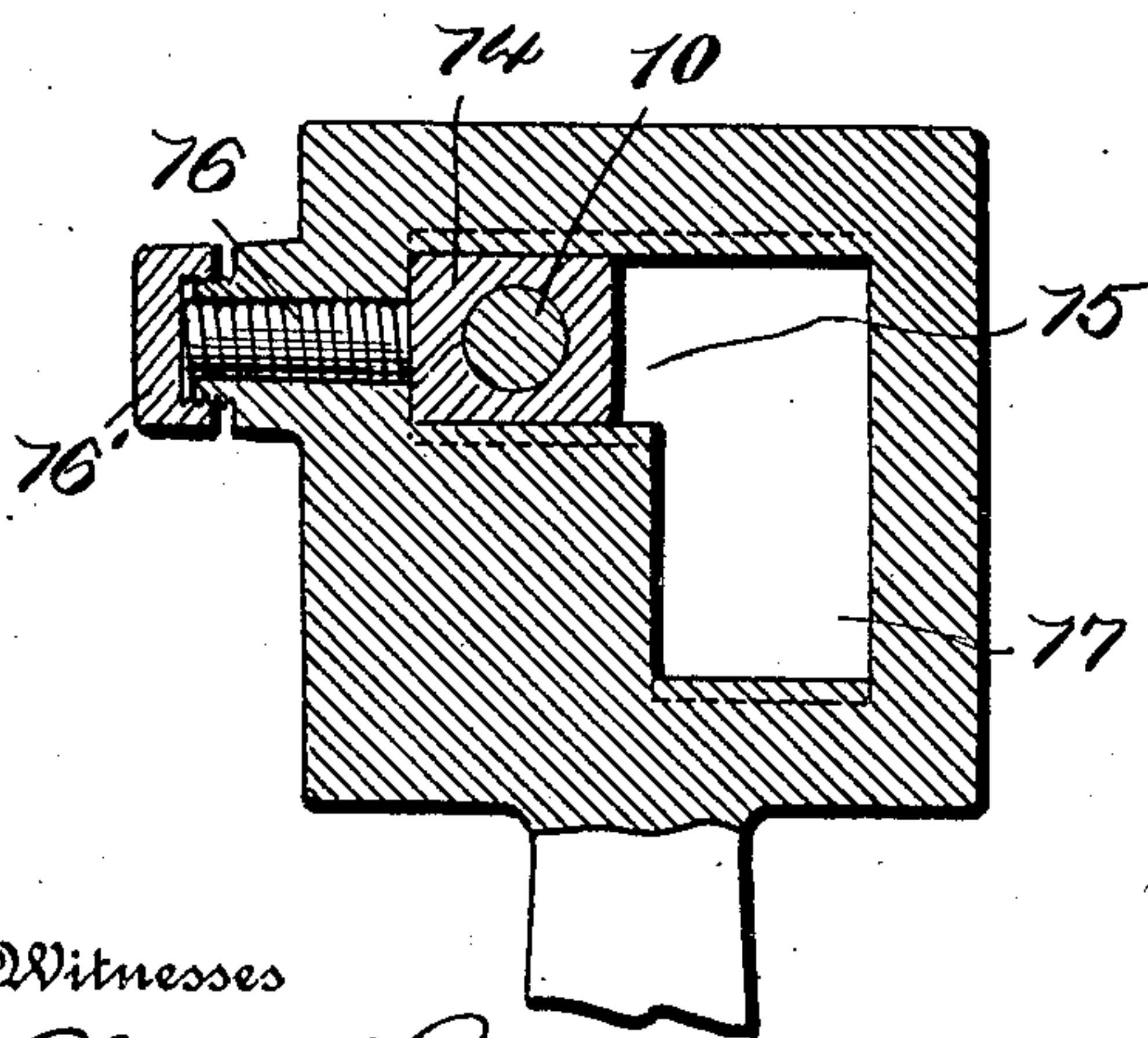
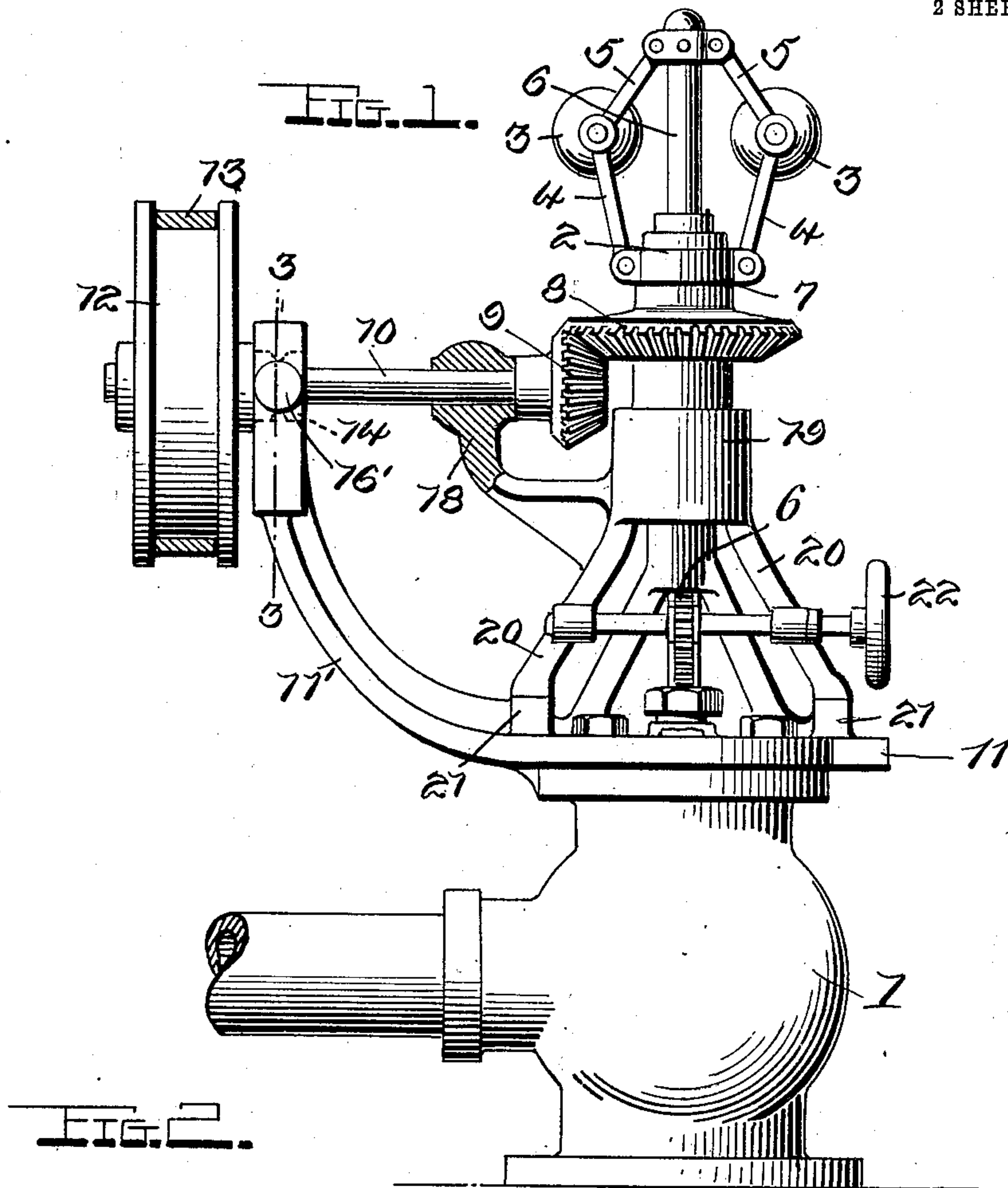


J. O. JOHNSON.  
SAFETY CENTRIFUGAL VALVE.  
APPLICATION FILED MAY 13, 1911.

998,906.

Patented July 25, 1911.

2 SHEETS—SHEET 1.



Witnesses

Chas. L. Griesbauer.  
L. G. Ellis.

Inventor

John O. Johnson

By

Watson E. Coleman.

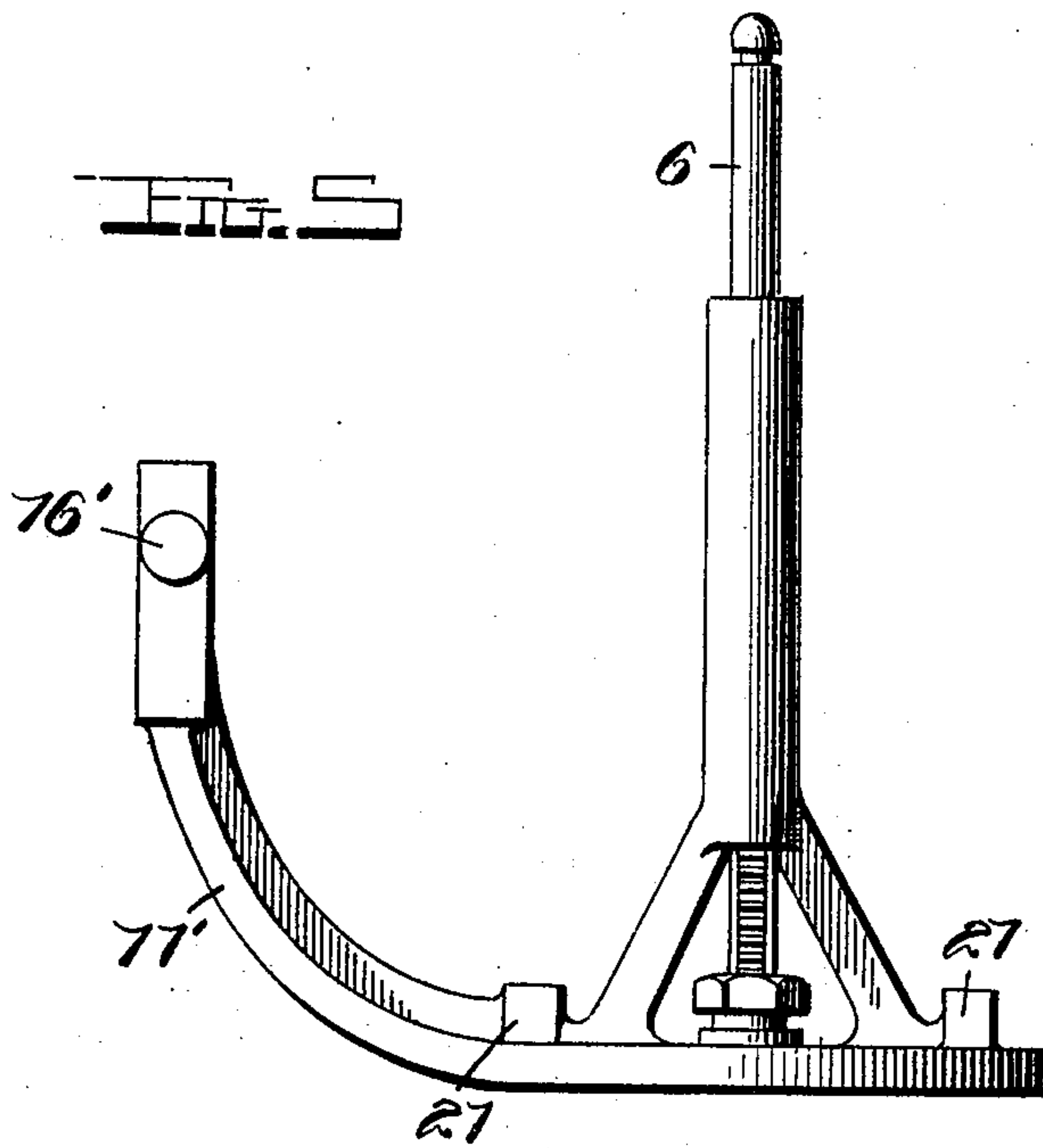
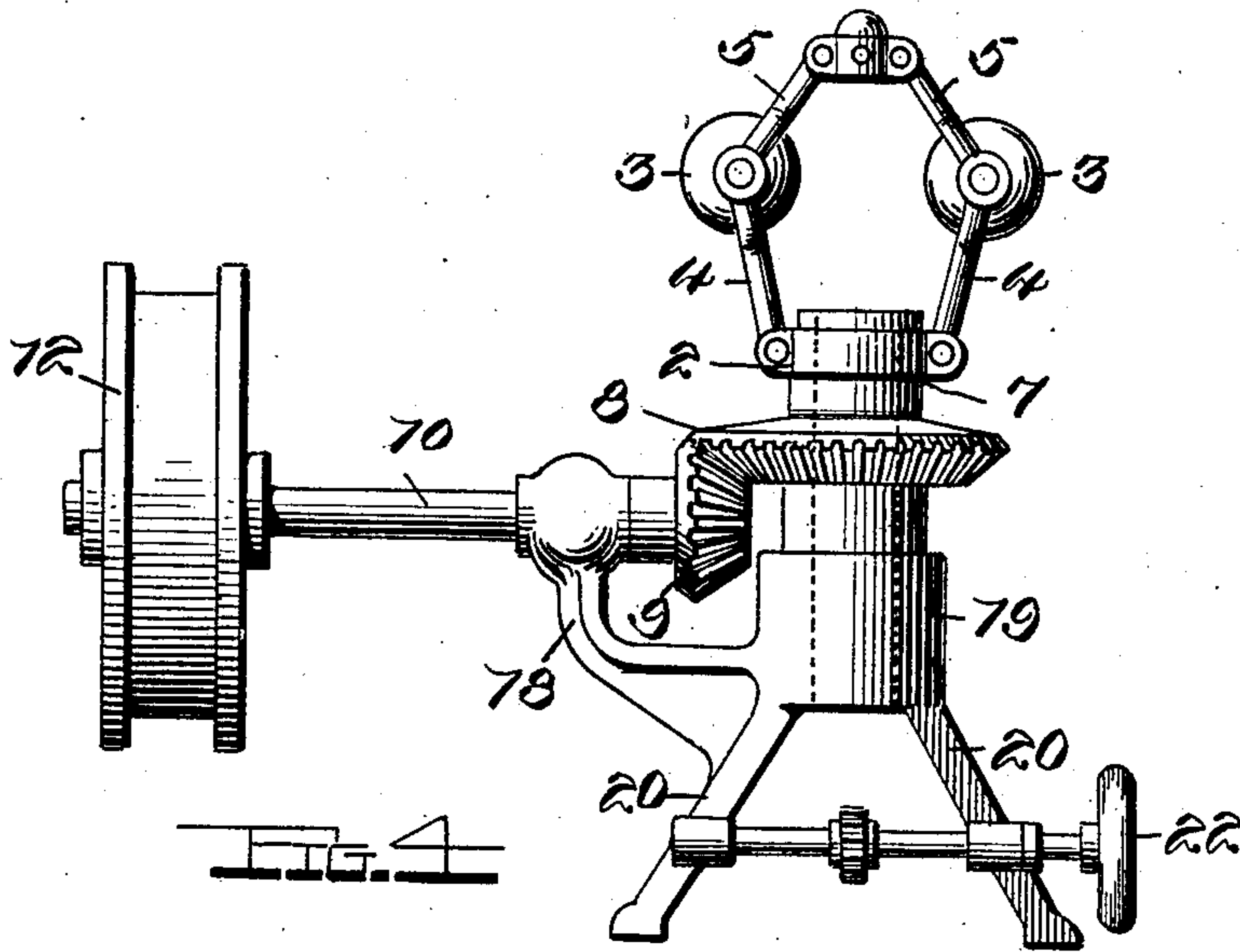
Attorney

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# UNITED STATES PATENT OFFICE.

JOHN O. JOHNSON, OF CUSHING, MINNESOTA.

## SAFETY CENTRIFUGAL VALVE.

998,906.

Specification of Letters Patent.

Patented July 25, 1911.

Application filed May 13, 1911. Serial No. 627,048.

*To all whom it may concern:*

Be it known that I, JOHN O. JOHNSON, a citizen of the United States, residing at Cushing, in the county of Morrison and State of Minnesota, have invented certain new and useful Improvements in Safety Centrifugal Valves, of which the following is a specification, reference being had to the accompanying drawings.

10 This invention relates to governors and more particularly to a safety device arrangement to be applied to governors.

15 The objects of my invention are to provide means on a governor, particularly those of the centrifugal type, whereby the breaking of the belt or the shaft that turns the operating mechanism of the governor, which actuates and controls the valve, will cause the valve to close.

20 Another object of my invention is to provide an arrangement whereby the above mentioned means can be readily set.

25 Other objects of my invention will become apparent as my invention is more fully set forth.

30 It is well known that engines, whether steam, gas, or turbines that use centrifugal governors, are more or less subject to what is known as racing, when the belt or the driving mechanism of the governor breaks, thereby causing very often a great deal of damage, not only to the engine and operators, but to the building in which the engines are in. That the need of such a device of this character has been advantageous and essential, is well known to the profession and has brought forth many inventions which are more or less connected with the racing of the engines, involving, in many cases, weights attached to the wheels or handles of the valves, that is, weights being suitably arranged to shut off the valves by means of a catch or similar device, such arrangements very often requiring an elaborate system of electrical connections, ropes and pulleys, cutting of the floors, and such like provisions. In this device, no special provision need be made in the building, nor even in parts beyond the valve mechanism of the governor, which is, in itself, a great advantage and desirable feature for such a device.

55 The great advantage of this invention is that it requires no particular attendance or inspection by the operators who watch the

engines it is for, and its operation is entirely automatic and distinctly positive when any conditions should require it to act; further, its action is practically instantaneous which, of course, adds greatly to its value in an engine room.

The particular dangers met with in ordinary engines, particularly those of the Corliss type, which almost invariably use this type of governor, are those which arise when the belt operating governor breaks, which causes the engine to race, and thereby rotate the fly wheel at an enormous rate which, in turn, causes the fly wheel to burst and destroy the engine as well as the building in which the engine is in.

In turbines and the like, the racing of the turbine wheels causes the cups or blades thereon to fly off and tear the casing of the machine, or even if this dangermark should not be reached, it almost invariably causes the blades to be distorted from their position, and to practically ruin the engine.

Of course, this is a brief résumé of the incidents that are likely to happen in engines that are controlled by a centrifugal type of governor. It is well known and appreciated that there are many more which all tend to make this invention more valuable.

In the accompanying drawings, which illustrate by way of example an embodiment of my invention,

Figure 1 is a view in elevation of a valve embodying my invention; Fig. 2 is a section taken on line 3—3 of Fig. 1; and Fig. 3 is a detail of a valve leg and lug of Fig. 1. Figs. 4 and 5 are details of parts of the safety control.

In the accompanying drawings, 1 represents an ordinary type of steam valve, such as is used on Corliss engines and the like, and on the top of which is mounted a centrifugal governor 2, which has balls 3 mounted on arms 4 and levers 5 which actuate the valve rod 6, and thereby open and close the valve as the requirements of the engine necessitate. Mounted on the lower portion of the base 7 that supports the parts 4 are suitable beveled gears 8 and 9, the gear 9 being on the shaft 10 which is supported by an arm 11', that is attached to the valve proper, and whose upper portion is arranged with a bearing slot which will be described later.

12 is a pulley that is mounted on the shaft



10 and is actuated by a belt 13 which is actuated by the fly wheel or other suitable moving part of the engine.

While I have described a pulley 12, I anticipate the use of sprockets and chains or suitable gearing arranged to perform a similar service as that which the belt and pulley are intended for, but I have shown a belt and pulley as that is the arrangement most commonly met with in practice.

Referring particularly to Fig. 2, which shows a section across the line 3—3 of Fig. 1, and points out more distinctly the parts that serve to produce the desired results intended by my invention, the shaft 10 revolves in an ordinary bearing portion 14 and is normally held there by the tension of the belt on the pulley 12 in a recess 15. Behind the shaft is disposed a spring 16 having a cap 16' for keeping the tension against the side of the shaft 10 and tends to press the shaft away from it, the tension of the belt, however, preventing the pulley and its shaft from being pushed away. The other side of the bearing is recessed with a groove 17 which is arranged to receive and lower the shaft should the pressure of the spring be greater than that of the tension of the belt. This arrangement is provided so that in case the belt should break, 10 will be pushed into the groove 17; the shaft being permanently connected to the arm 18 of the stand 19 which supports the main centrifugal mechanism causes the whole stand to slightly revolve. The stand 19 is supported on a plurality of legs 20 which, in turn, rest on lugs 21 that are integrally formed on a plate 11 secured to the valve 1. As the stand revolves, its legs 20 slip off the lugs 21, and thereby cause the whole stand to descend slightly, but sufficiently to cause the valve rod 6, which is connected to it, to close the valve of the engine and thereby stop it. While it is not essential, it is desirable for practical reasons to include a supplementary valve handle 2 to close the valve, but same is not essential and I anticipate its use or any of the ordinary parts used in common valve design.

In operation, the belt turns the pulley 12 which, in turn, turns the shaft 10 and gears 8, 9, and base 7, and causes the balls 3 to revolve. As the balls revolve they tend to pull out the arms 4 and also pull down on the levers 5. As the arms 4 are stationarily connected to the base 7, and the levers 5 connected to the valve rod, which is movable, the valve rod is operated either up or down, depending on the speed at which the balls are being driven at. In case of high speed, the balls will fly out considerably and tend to push the valve rod 6 down and thereby close the valve. Under low speeds the balls will return to their first position or close to the valve rod and thereby permit the valve

to rise and open to permit more steam or other fluid to flow to the engine.

Should the belt break, the spring 15 immediately pushes the rod or shaft 10 from out of its bearing space 14 into the lower and forward space 17 and, at the same time, revolves the whole stand 19 on the valve rod 6, and thereby causes the legs 20 to slip off the lugs 21 and permits the stand to descend and close the valve.

It can be easily seen that this device will quickly act in case of an accident such as is anticipated, or even in case the belt should loosen.

Obviously while I have described my device as particularly suitable for steam engines and the like, I anticipate that it can be used for turbines of all kinds or even shafts that have need of a certain amount of control, or by machines that are particularly dangerous and should have means for quickly controlling them and shutting them off, and I do not wish to be limited in any way, otherwise than necessitated by the prior art, as I am aware that many modifications of my invention can be made without departing from the principles thereof.

Having thus described the invention, what I claim is:—

1. A safety centrifugal valve comprising in combination a valve having a valve rod extending out therefrom, centrifugal means arranged to control said rod, a pulley, a belt or the like for actuating said pulley, a shaft for said pulley, a plate disposed on said valve having an arm extending therefrom, said arm being provided with a bearing slot arranged to give a plurality of positions to the shaft, said plate having a plurality of lugs thereon, a spring in said slot pressing on said shaft against the pull of said belt on the pulley, and a stand having a plurality of legs normally resting on said lugs and having an arm extending therefrom, said arm being arranged to hold said shaft, the stand being arranged to be rotated when the pulley is out of engagement with the belt.

2. A safety centrifugal valve comprising in combination a valve having a valve rod extending out therefrom, centrifugal means arranged to control said rod, a pulley, a belt or the like for actuating said pulley, a shaft for said pulley, a plate disposed on said valve having an arm extending therefrom, said arm being provided with means to hold the shaft and permitted to move therein when the pulley is out of engagement with the belt, said plate having a plurality of lugs thereon, and a stand having a plurality of legs normally resting on said lugs and having an arm extending therefrom, said arm being arranged to hold said shaft.

3. A safety centrifugal valve comprising



in combination a valve having a valve rod  
extending out therefrom, centrifugal means  
arranged to control said rod, a pulley, a  
belt or the like for actuating said pulley,  
5 a shaft for said pulley, a plate disposed on  
said valve having an arm extending there-  
from, said arm being provided with a bear-  
ing slot in the upper portion thereof, said  
slot being arranged to give a plurality of  
10 positions to the shaft and having a spring  
therein to press against said shaft against  
the pull of said belt on the pulley and posi-  
tively moving the shaft from one position  
to another when the pulley is out of engage-  
15 ment with the belt, said plate having a plu-  
rality of projections disposed thereon, and  
a stand having a plurality of lugs disposed  
on the bottom portion thereof and normally  
resting on said projections and having an  
20 arm extending from one side thereof, said  
arm being arranged to support said shaft  
and be actuated thereby when the shaft  
moves from one position to another.

4. A safety centrifugal valve comprising  
25 in combination a valve having a valve rod  
extending up therefrom, means arranged to  
control said valve rod, a belt or the like for

actuating said pulley, a shaft for said pul-  
ley, a plate disposed and secured to said  
valve having an arm extending therefrom, 30  
said arm being provided with a bearing slot  
in the upper portion thereof, said slot being  
arranged to give a plurality of positions to  
the shaft and having a spring therein to  
press against said shaft against the pull of 35  
said belt on the pulley and positively mov-  
ing the shaft from one position to another  
when the pulley is out of engagement with  
the belt, said plate having a plurality of  
projections disposed thereon, and a stand 40  
having a plurality of lugs disposed on the  
bottom portion thereof and normally rest-  
ing on said projections and having an arm  
extending from one side thereof, said arm  
being arranged to support said shaft and 45  
be actuated thereby when the shaft moves  
from one position to another.

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

JOHN O. JOHNSON.

Witnesses:

J. A. BARNES,  
JAMES P. WEIR.