

No. 689,401.

Patented Dec. 24, 1901.

W. KITTS.

STOP ATTACHMENT FOR STEAM GOVERNORS.

(Application filed May 15, 1901.)

(No Model.)

2 Sheets—Sheet 1.

Fig. 1.

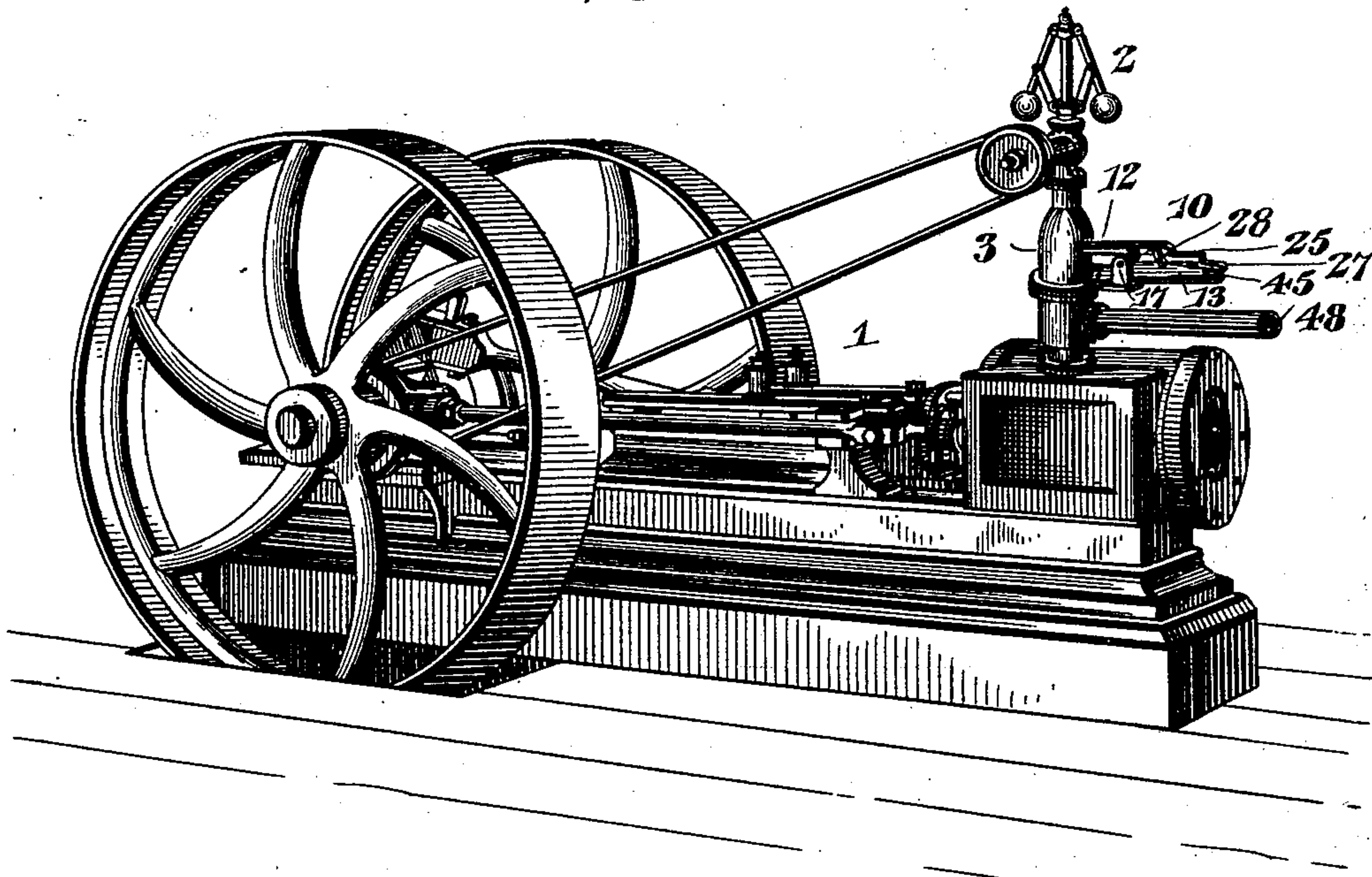
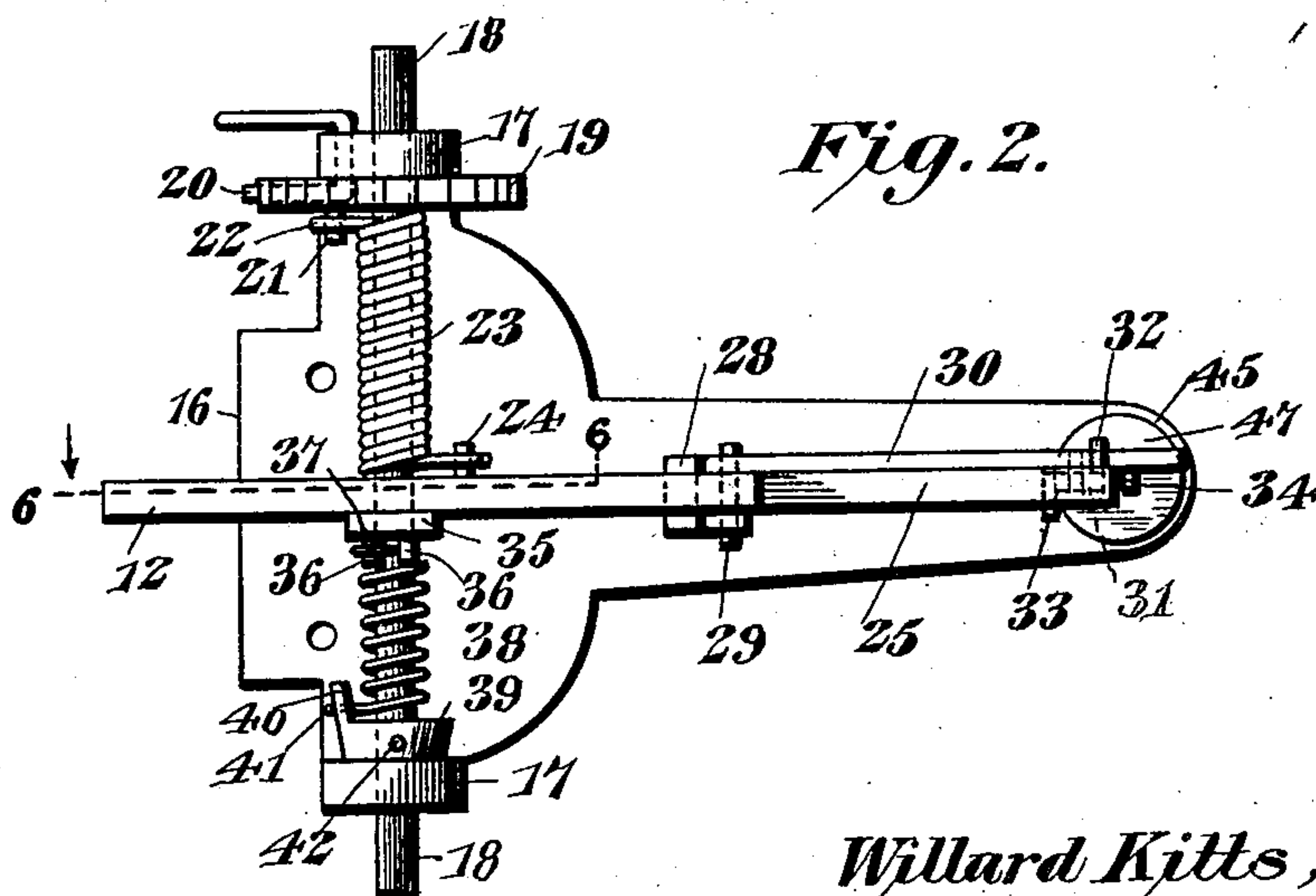


Fig. 2.



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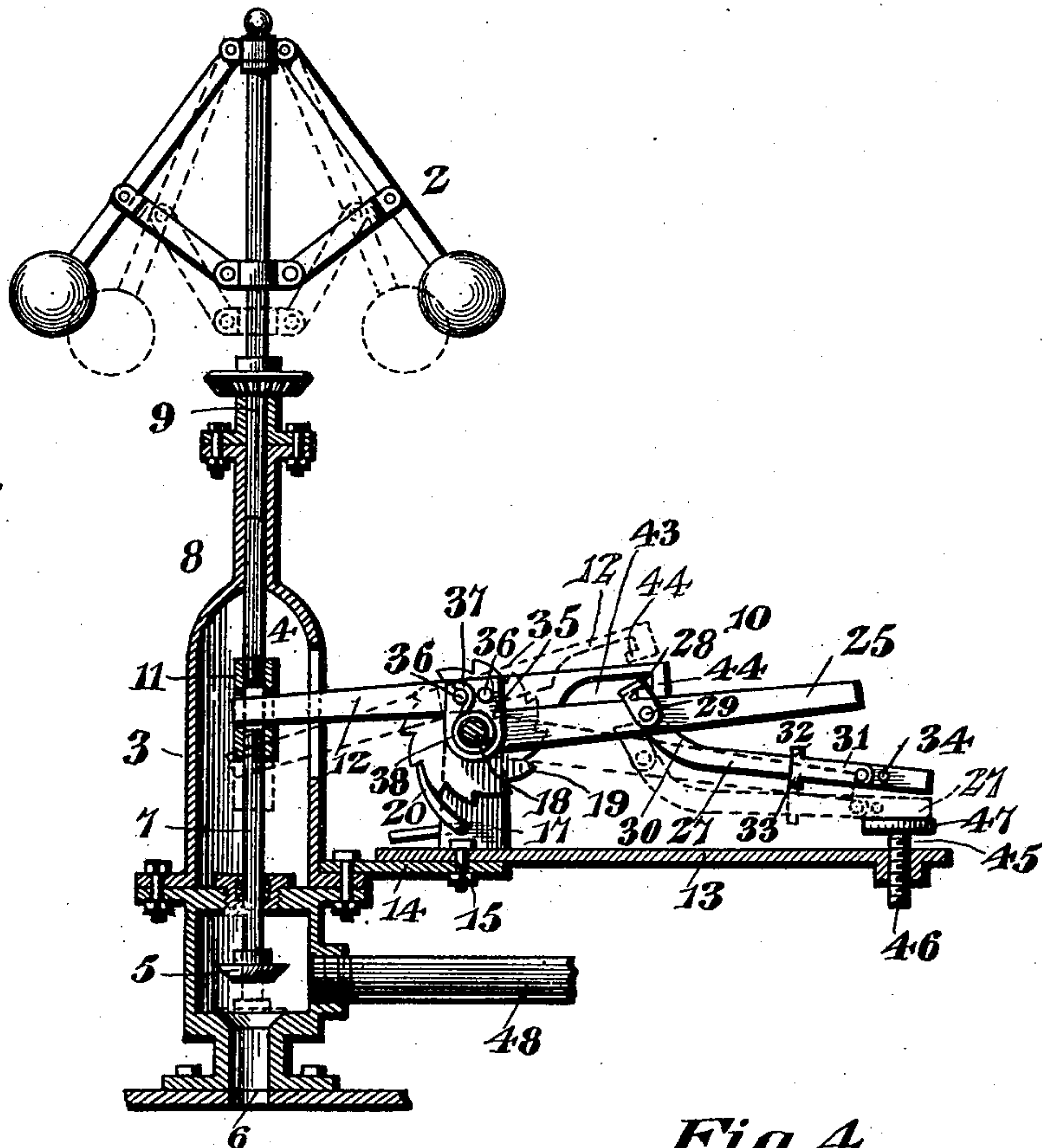
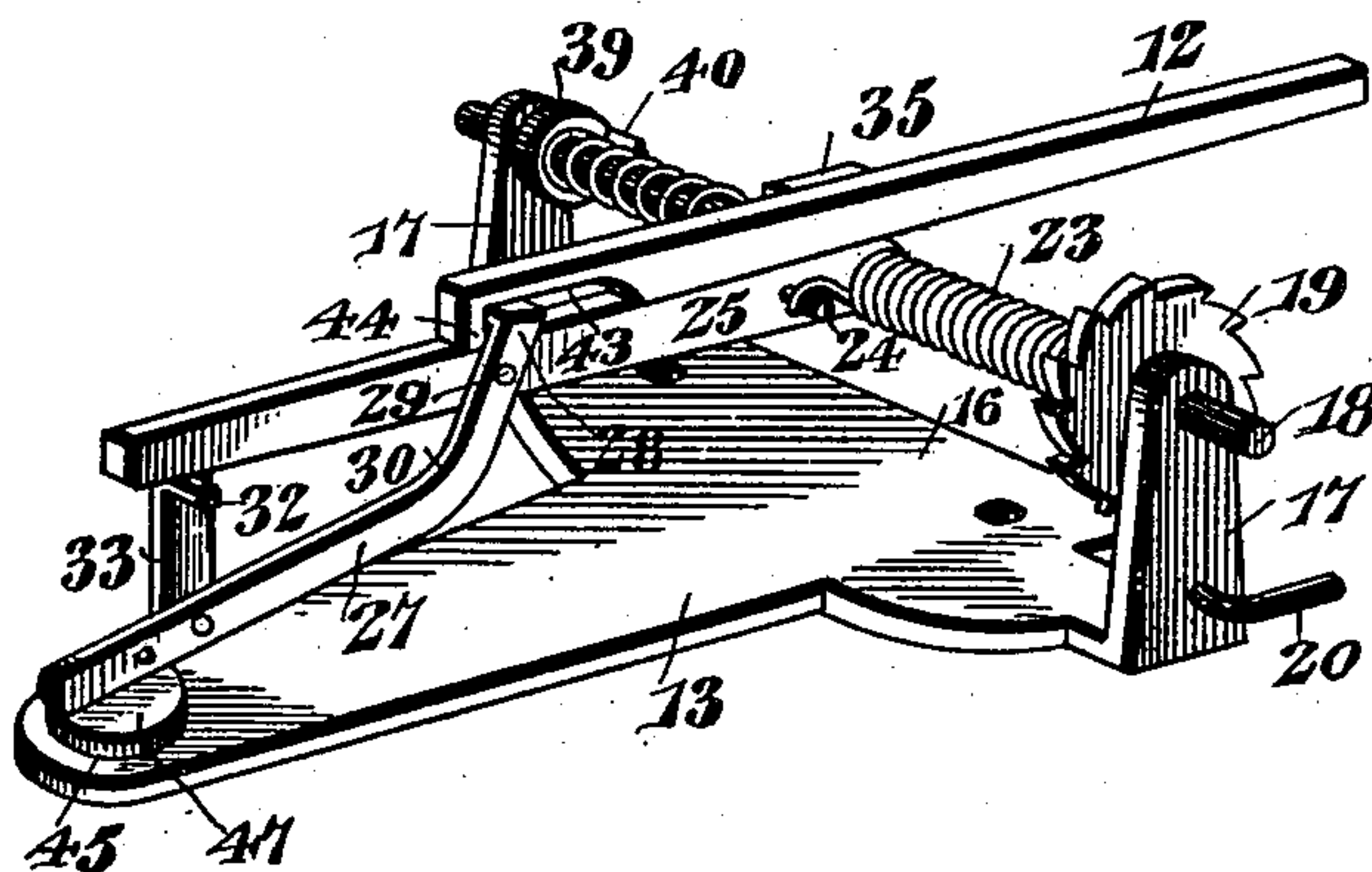
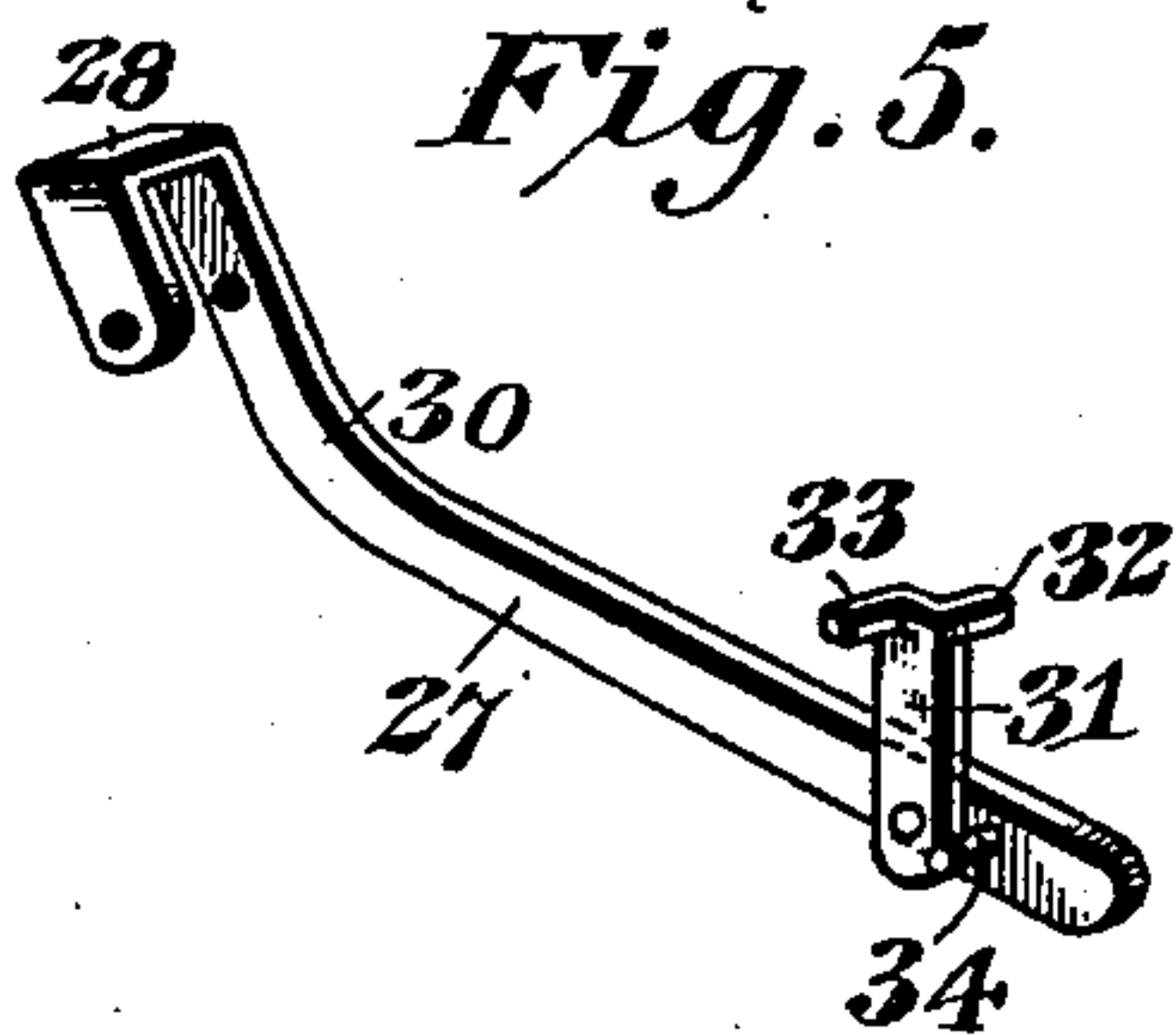
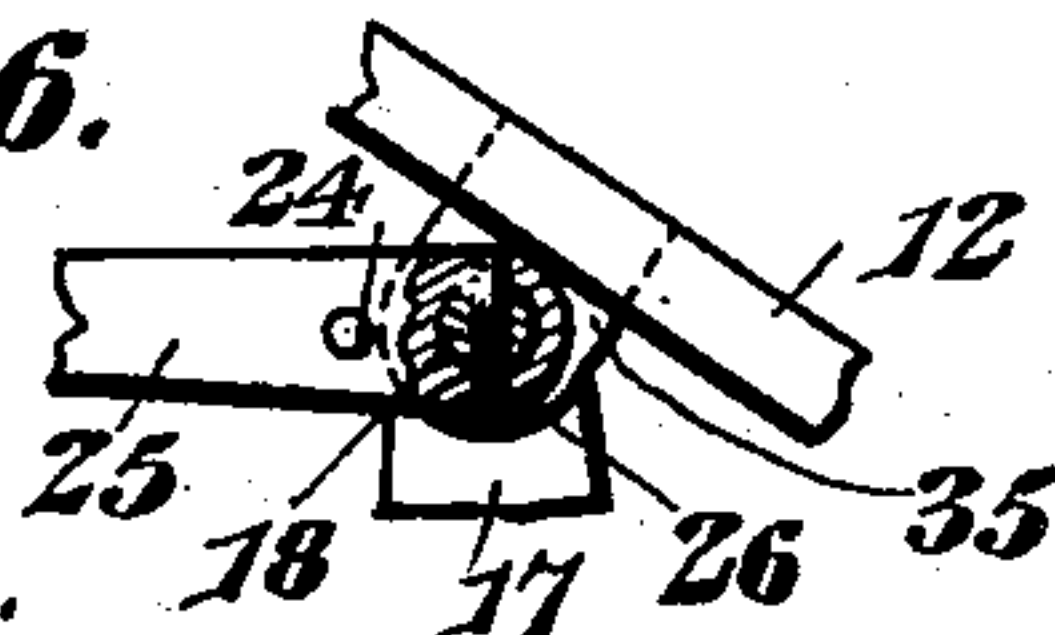
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Fig. 3.*Fig. 4.**Fig. 5.**Fig. 6.*

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UNITED STATES PATENT OFFICE.

WILLARD KITTS, OF BRADRICK, OHIO.

STOP ATTACHMENT FOR STEAM-GOVERNORS.

SPECIFICATION forming part of Letters Patent No. 689,401, dated December 24, 1901.

Application filed May 15, 1901. Serial No. 60,362. (No model.)

To all whom it may concern:

Be it known that I, WILLARD KITTS, a citizen of the United States, residing at Bradrick, in the county of Lawrence and State of Ohio, have invented a new and useful Stop Attachment for Steam-Governors, of which the following is a specification.

This invention relates to stop attachments for steam-governors.

10 An object of the invention is to present a simply-constructed, thoroughly-efficient, cheap, and durable device of the character specified which in use will be certain of operation to cut off the supply of steam to the
15 steam-chest should the governor-belt slip and break.

A further object is to present an attachment that shall be neat in appearance and compact in form, so that when assembled with
20 the valve-stem casing it will not present an obstruction that will be liable to be struck, thereby reducing the liability of damage to the device to a minimum.

A still further object is to construct the
25 parts of the device in such manner that should one or more of them break such part or parts may be readily supplied by a mechanic of ordinary skill.

A still further object of the invention is to
30 assemble the parts of the device in such manner as to permit of their being readily disassociated when desired.

With these and other objects in view the invention consists in the novel construction
35 and combination of parts of a stop attachment for steam-governors, as will be herein-after fully described and claimed.

In the accompanying drawings, forming a part of this specification, and in which like
40 numerals of reference indicate corresponding parts, I have illustrated a form of embodiment of my invention as applied to an ordinary horizontal engine, it being understood that the particular form and arrangement of
45 the parts of the device herein shown and the particular manner in which it is associated with the valve-stem may be varied or entirely changed without departing from the spirit of the invention.

50 In the drawings, Figure 1 is a view in perspective, exhibiting a horizontal steam-engine with the attachment associated with the

valve-stem casing. Fig. 2 is a view in plan of the device detached from the engine. Fig. 3 is an enlarged detail view, in sectional elevation, exhibiting the device as it appears
55 when connected with the valve-stem casing and in coöperative relation with the valve-stem. Fig. 4 is a perspective detail view of the device detached. Fig. 5 is a perspective
60 detail view of the trigger detached. Fig. 6 is a vertical longitudinal sectional view taken on the line 6 6 of Fig. 2, showing the manner in which the trigger-arm is associated with
65 the supporting-shaft.

Referring to the drawings, 1 designates generally a horizontal steam-engine; 2, the governor; 3, the valve-stem casing; 4, the valve-stem; 5, the valve carried by the stem, and
70 6 the induction-port leading to the steam-chest. All of these parts may be of the ordinary or any preferred construction, and a detailed description thereof is deemed unnecessary.

While the device is herein shown as associated with an ordinary ball-governor, it is to be understood that it is equally adaptable in connection with a spring-governor. The only difference in the construction of the valve-stem 4 over that in ordinary use is that the
80 same is in this instance of three parts, (designated, respectively, 7, 8, and 9,) the portion 9 being that with which the governor coöperates to raise or lower it. The reason for constructing the valve-stem in this manner is to
85 adapt it to the stop attachment, (designated generally 10,) and for this purpose the sections 7 and 8 of the valve-stem are connected by a coupling 11, having a transverse orifice or opening in which the valve-stem-actuating
90 lever or throw-arm 12 of the attachment works.

In order to render clear an understanding of how the present device operates and to present the salient feature that differentiates it
95 from other devices of this character heretofore patented and used, it is to be observed that the upward movement of the valve-stem is that which effects automatic release of the device to cause it to close the valve down
100 upon its seat, so that it will be obvious the valve-stem 4 must be in two sections, the lower section to be moved away from the upper section when the attachment operates.

The attachment comprises a base-plate 13, the same when in operative position to be secured in any suitable manner to the valve-stem casing, the manner of attachment herein shown being only one of many that may be employed for the purpose and consisting of a plate 14, bolted to the valve-casing and supporting the base-plate 13, the connection being effected by bolts 15, as clearly shown in Fig. 3. The base-plate is here shown as having its front end broad and its rear end tapered into a tongue, the object of this arrangement being to make the device as light and small as consistent with its proper operation. The particular shape of the base-plate here shown is one that will be generally preferred; but it is to be understood that this shape may be varied to suit different requirements that might arise in its use, and for this reason it is to be understood that I do not limit myself to the exact form of base-plate shown. The head portion 16 of the base-plate is provided on each side with two upward-extending arms or lugs 17, which may be integral with the base-plate or secured thereto, and journaled in suitable bearings in the upper portions of these arms is a transverse shaft 18, carrying near one end and on the inside of one of the arms a ratchet-wheel 19 to be engaged by a pawl 20. On the inner face of the ratchet-wheel is a pin or stud 21, (clearly shown in Fig. 2,) this pin to be engaged by the straight end 22 of a coiled spring 23, mounted on the shaft, the other end of the spring being bent straight to engage with a pin 24, carried by the trigger-arm 25, the trigger-arm being rigidly secured to the shaft by a pin 26. (Shown in Fig. 6.) The force applied to the trigger-arm from the spring 23 causes the arm normally to be projected toward the base-plate, so that when the device is released in the manner hereinafter to be described the trigger-arm will be instantly thrown toward the base-plate, thereby effecting instant release of the trigger 27, presently to be described. The function of the ratchet-wheel 19 and pawl 20 is to hold the spring 23 under the desired tension, as will be readily understood by reference to Fig. 4.

At a point intermediate of the ends of the trigger-arm 13 is pivoted the trigger 27, the same comprising a bar of metal provided at its upper end with a yoke 28 to straddle the trigger-arm and to be held in pivotal relation therewith by a pin 29, the portion of the trigger near the trigger-arm being bent or curved, as at 30, thereby to cause the arch of the yoke to occupy the proper position with relation to the throw-arm 12 when the device is set.

The lower portion of the trigger carries a trigger-lock 31, the same being pivoted to the trigger and having on one side a projection 32 to engage with the top of the trigger, and thus to limit the downward movement of the trigger-lock, and on the opposite side with a projection 33, by which the lock may be grasped and moved to and from the trigger,

a stop-pin 34 being provided on the trigger to limit the backward movement of the trigger-lock. When the engine is not running, this trigger-lock is brought under the trigger-arm, as shown in Fig. 4; but when the engine is running the lock is moved out of engagement with the trigger-arm and into the position shown in Fig. 3.

The valve-stem engaging or throw arm 12, before referred to, is mounted for swinging movement on the shaft 18 independently of and in a direction opposite to the movement of the trigger-arm 25. The manner of connecting the throw-arm 12 with the shaft consists of, in this instance, providing the arm with a plate or projection 35, which may be either secured to or integral with the arm, the plate being transversely orificed to work on the shaft, this plate being shown in Figs. 4 and 5. The plate carries two stop-pins 36, (shown in Figs. 2 and 3,) and between these pins is held one end 37 of a spring 38, the same being coiled upon the shaft and being held from rotation thereon by a collar 39, provided with a slotted arm 40, in which the other end 41 of the spring is held, the collar being held against rotation on the shaft by a pin 42, passing through the collar and into the shaft. The spring 38 is here shown as somewhat weaker than the spring 23, it only being necessary that the spring be of sufficient strength to force the valve to its seat against the pressure of incoming steam; but it is to be understood that, if desired, this spring may be of the same strength or of greater strength than the spring 33 and still be within the scope of my invention.

The inner end of the throw-arm 12 is incut, as at 43, and is formed with a toe or catch 44, extending parallel with the length of the arm, this toe to be engaged by the arch of the yoke 28, which constitutes the sear, to hold the throw-arm down on the trigger-arm, as shown in Figs. 3 and 4, thereby effecting setting of the device. The outer end of the arm 12 engages with the orifice in the coupling 11 of the valve-stem, as shown in Fig. 3, the normal or operative position of the valve 5 being shown in this figure as raised and its closed or cut-off position being shown in dotted lines, the parts of the stop attachment being shown in operative position in full lines and in sprung position in dotted lines.

At the outer or narrow end of the base-plate is provided a trigger-set 45, comprising in this instance a threaded shank 46 to engage with a threaded opening in the base-plate, and the flat circular head 47, upon which the trigger will rest when the device is swung, as shown in Fig. 3. By adjusting the trigger-set up and down the range of movement of the valve-stem may be accurately adjusted, so that the throw of the valve-stem may be adjusted at will.

The operation of the device is as follows: The device being set and the parts in the position shown in Fig. 3, with the trigger rest-

ing on the trigger-set 45 and the trigger-lock under the trigger-arm, steam is admitted to the engine through the supply-pipe 48. As soon as the governor starts revolving the trigger-lock is manually moved to the position shown in Fig. 3, and so long as the governor continues to revolve the section 9 of the valve-stem by bearing on the section 8 will exert a lifting pressure on the arm 12, and thereby keep the trigger from coming into engagement with the trigger-set. It is to be understood that the trigger-set is to be so adjusted initially that when the governor is at its normal position, or that occupied when the highest rate of speed desired is attained, the trigger will be out of contact with the trigger-set; but should this rate of speed be exceeded, even without the belt slipping or breaking, the further lifting of the valve-stem will effect release of the trigger, and thereby close the valve. It is to be understood that the sections 7 and 8 do not revolve, as the connection between the throw-arm 12 and the stem would prevent this in the arrangement shown; also, that the valve, and with it the sections 7 and 8, is held raised by the pressure of the steam under the valve. In the event that the governor-belt slips or breaks the parts will instantly assume the position shown in dotted lines in Fig. 3, thereby raising the section 9 and permitting the steam to throw the sections 7 and 8 violently upward. In the upward movement of the valve-stem the throw-arm 12 is moved upward, thereby bringing the trigger into engagement with the trigger-set, throwing the sear out of engagement with the toe 44, thereby freeing the throw-arm, which instantly assumes the position shown in dotted lines in Fig. 3 and effects shutting off of the steam to the engine. Hence I have provided valve-closing means which is entirely independent of the engine, is normally held inactive by the governor, and also tripped into operation by the latter should said governor fail to work.

It will be seen from the foregoing description that while the device of the present invention is of an exceedingly simple construction its parts are so combined and operate in such manner as to render certain the proper operation of the device in an emergency. There are no parts to be rust-locked or to bind for want of oil or to refuse to operate for other causes, as all of the parts will be assembled in such manner as to operate freely.

From the foregoing it is thought that the construction, operation, and many advantages of the herein-described invention will be apparent to those skilled in the art without further description, and it will be understood that various details of construction may be resorted to without departing from the spirit or sacrificing any of the advantages of the invention.

What I claim is—

1. A stop attachment for steam-engines

comprising a valve-stem-actuating arm, a trigger-arm, a trigger carried by the latter arm and operating to hold the said actuating-arm in set position with relation to the trigger-arm, and means for effecting throw of the two arms in opposite directions whereby to release the trigger and to cause the valve-stem-actuating arm to seat the valve.

2. A stop attachment for steam-engines comprising a valve-stem-actuating arm, a trigger-arm, a trigger carried by the latter arm and operating to hold the actuating-arm in set position with the trigger-arm, means operating to throw the two arms in opposite directions, and means for releasing the trigger when the said arms are sprung.

3. A stop attachment for steam-engines comprising a base supporting a shaft, a valve-stem actuating or throw arm loosely mounted on the shaft, a trigger-arm fixed to the shaft, a trigger carried by the latter arm and operating to hold the throw-arm in set position with relation to the trigger-arm, and two springs mounted on the shaft, one of which operates to throw the trigger-arm in one direction and the other to throw the valve-stem-actuating arm in the other direction.

4. A stop attachment for steam-engines comprising a base supporting a shaft, a valve-stem actuating or throw arm loosely mounted on the shaft, a trigger-arm fixed to the shaft, a trigger carried by the latter arm and operating to hold the throw-arm in set position with relation to the trigger-arm, two springs mounted on the shaft, one of which operates to throw the trigger-arm in one direction and the other to throw the valve-stem-actuating arm in the other direction, and means for placing the spring that actuates the trigger-arm under requisite tension.

5. A stop attachment for steam-engines comprising a base-plate provided with bearings, a shaft mounted in the bearings and carrying a throw-arm loosely mounted thereon, and a trigger-arm rigidly secured thereto, a trigger carried by the latter arm and having a portion adapted to engage the throw-arm, means for actuating the two arms to throw them in opposite directions, and a projection arranged in the path of movement of the trigger whereby to free the same from engagement with the throw-arm when the arms are sprung.

6. A stop attachment for steam-engines comprising a base-plate provided with bearings, a shaft mounted in the bearings and carrying a throw-arm loosely mounted thereon, and a trigger-arm rigidly secured thereto, a trigger carried by the latter arm and having a portion adapted to engage the throw-arm, means for actuating the two arms to throw them in opposite directions, and an adjustable trigger-set arranged in the path of movement of the trigger to release the same when the arms are sprung.

7. A stop attachment for steam-engines comprising a base-plate, a shaft supported

thereon, a trigger-arm rigidly connected with the shaft, a throw-arm loosely connected with the shaft and provided with a toe, a trigger pivoted on the trigger-arm and having a sear to engage the toe on the throw-arm, two springs mounted on the shaft, one of which operates to swing the trigger-arm in one direction and the other to swing the throw-arm in the opposite direction, and means arranged in the path of movement of the trigger to release its sear from engagement with the toe of the throw-arm.

8. A stop attachment for steam-engines comprising a base-plate supporting a shaft, a throw-arm loosely mounted intermediate of its ends on the shaft, a trigger-arm rigidly secured near one end to the shaft, a trigger carried by the trigger-arm to engage with the throw-arm, an adjustable trigger-set arranged in the path of movement of the trigger, and springs for throwing the two arms in opposite directions upon release of the trigger.

9. A stop attachment for steam-engines comprising a base-plate, a shaft supported thereon, a throw-arm loosely mounted on the shaft, a trigger-arm rigid with the shaft, a trigger carried by the latter arm, a trigger-set arranged in the path of movement of the trigger, a spring for throwing the throw-arm in one direction, a spring for throwing the trigger-arm in the opposite direction, and means for placing the latter spring under requisite tension.

10. A stop attachment for steam-engines comprising a base-plate, a shaft, two arms mounted on the shaft, means on the shaft for throwing the arms in different directions, one of the arms to engage with the valve-stem of an engine, and the other arm carrying a trigger to engage the first-named arm.

11. A stop attachment for steam-engines comprising a base-plate supporting a shaft, a throw-arm loosely mounted on the shaft and having a laterally-projecting stud or projection, a spring on the shaft having one end in engagement with the stud or projection and the other end in engagement with a collar fixed on the shaft, a trigger-arm rigid with the shaft and carrying a laterally-extending pin or projection, a ratchet-wheel on the shaft, a pin or projection on the ratchet-wheel, a spring having one end in engagement with the pin or projection on the trigger-arm and the end in engagement with the pin or projection on the ratchet-wheel, a pawl to engage the ratchet-wheel to hold the latter spring under requisite tension, a trigger carried by the trigger-arm and having a sear to engage the throw-arm, and an adjustable trigger-set arranged in the path of movement of the trigger.

12. A stop attachment for steam-engines comprising a base-plate supporting a shaft, a throw-arm loosely mounted on the shaft, a trigger-arm fixed to the shaft, springs for throwing the two arms in different directions, a trigger on the trigger-arm provided with a sear for engaging a projection on the throw-arm,

an adjustable trigger-set arranged in the path of movement of the trigger, and a trigger-lock operating normally to hold the trigger-arm out of engagement with the set.

13. A stop attachment for steam-engines, comprising two spring-pressed arms movable in opposite directions, a trigger carried by one arm to engage on the other arm, and means for springing the trigger.

14. A stop attachment for steam-engines comprising a base-plate carrying a shaft, a throw-arm loosely mounted on the shaft and having at one end a toe or projection, a trigger-arm rigid with the shaft, a trigger pivoted to the trigger-arm and having at one end a yoke pivotally connected with the trigger-arm, the crest of the yoke constituting a sear, and means for throwing the two arms in opposite directions, whereby to effect release of the trigger and coincidentally therewith the seating of the engine-valve.

15. A stop attachment for steam-engines, comprising a valve-stem, two arms having positive movement in opposite directions, and means for locking the two arms together, said arms being unlocked upon one of the arms moving to a predetermined point.

16. A stop attachment for steam-engines comprising a valve-stem, two arms having positive movement in opposite directions, and means for actuating the arms, the strength of the actuating means of one arm being greater than that of the other arm, and means for locking the two arms together.

17. In a steam-engine, the combination of a valve, a governor in operative relation thereto, a valve-closing device independent of the engine and normally held inactive by the governor, and a trip connection between the valve-closing device and the governor, said connection being constructed to throw the valve-closing device into operation by failure of the governor to work.

18. In a steam-engine, the combination of a valve, a valve-stem formed in two independent sections disposed in longitudinal alignment for mutual endwise contact, a governor in operative relation to the outer stem-section only, and constructed to normally hold the outer section in engagement with the inner stem-section, and an automatically-operating valve-closing device independent of the engine and normally held inactive by the governor and capable of being thrown into operation by failure of the governor to act, said valve-closing means having an operative connection with the inner stem-section.

19. In a steam engine, the combination with a valve, a valve-stem formed in two independent sections disposed in longitudinal alignment for mutual endwise contact, a governor in operative relation to the outer stem-section only and constructed to move the same into operative engagement with the other stem-section, a valve-closing device in operative relation to the inner stem-section, and a trip connection between the inner stem-section

and the valve-closing device, said trip connection being constructed to act when the governor fails to work.

5 20. In a steam-engine, a valve-stem composed of three parts one of which is connected with a governor and the other two being connected by an orificed coupling, in combination with a stop attachment arranged adjacent to the stem or casing, the attachment comprising
10 in part a spring-pressed throw-arm in engagement with the orifice in the coupling, a spring-pressed trigger-arm, a trigger carried

by the trigger-arm to engage the throw-arm, and means for releasing the trigger upon failure of the governor to work, thereby to permit the throw-arm to seat the valve and thus cut off the supply of steam. 15

In testimony that I claim the foregoing as my own I have hereto affixed my signature in the presence of two witnesses.

WILLARD KITTS.

Witnesses:

FRANK W. SFLARS,
FRED. SUITER.