

No. 862,034.

PATENTED JULY 30, 1907.

W. TREWHELLA.

MECHANISM FOR CONTROLLING THE PAWLS IN PAWL AND RATCHET  
MECHANISMS.

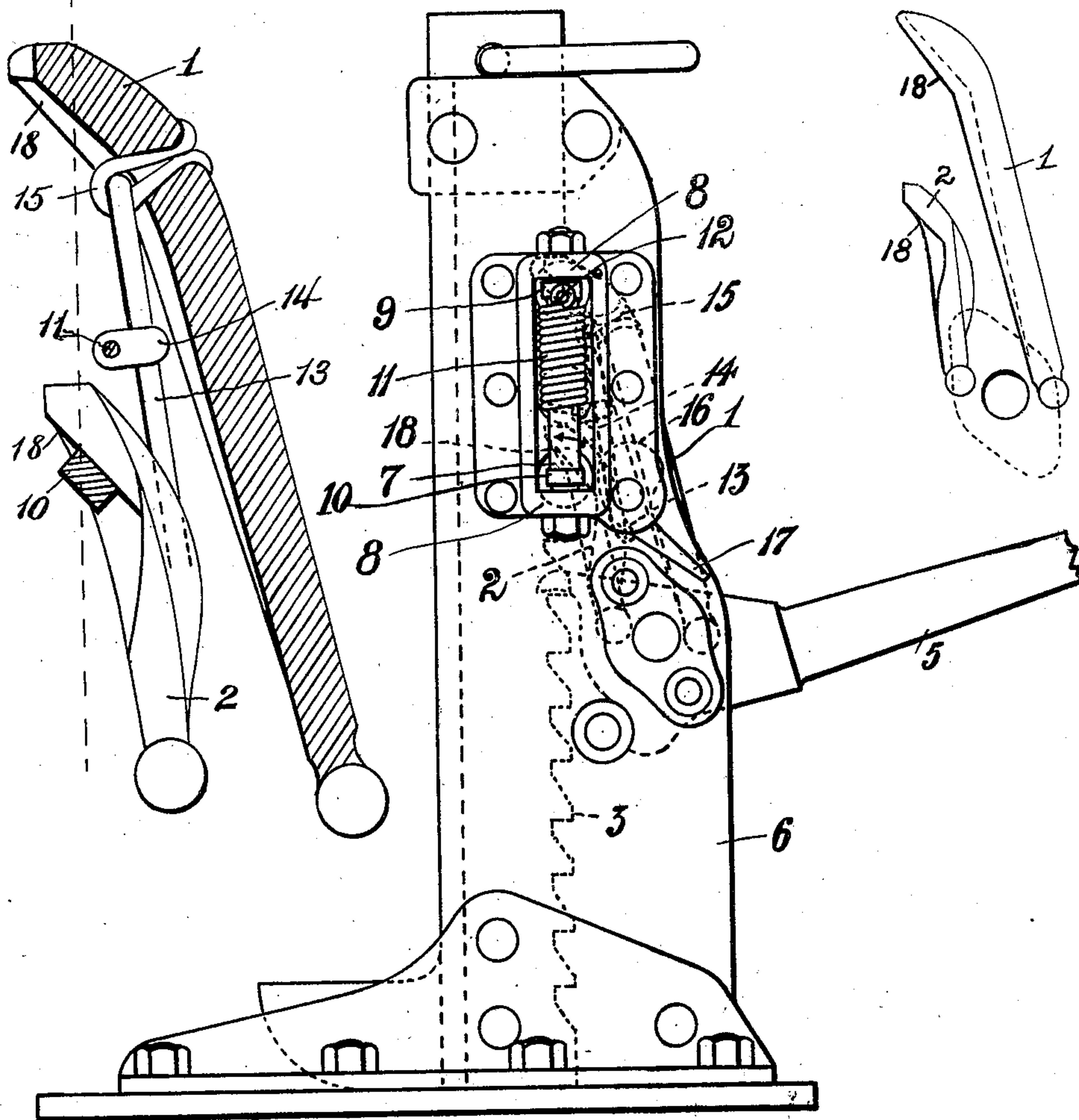
APPLICATION FILED FEB. 12, 1906.

3 SHEETS—SHEET 1.

Fig. 6

Fig. 1.

Fig. 5.



Witnesses

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3 SHEETS—SHEET 2.

Fig. 2.

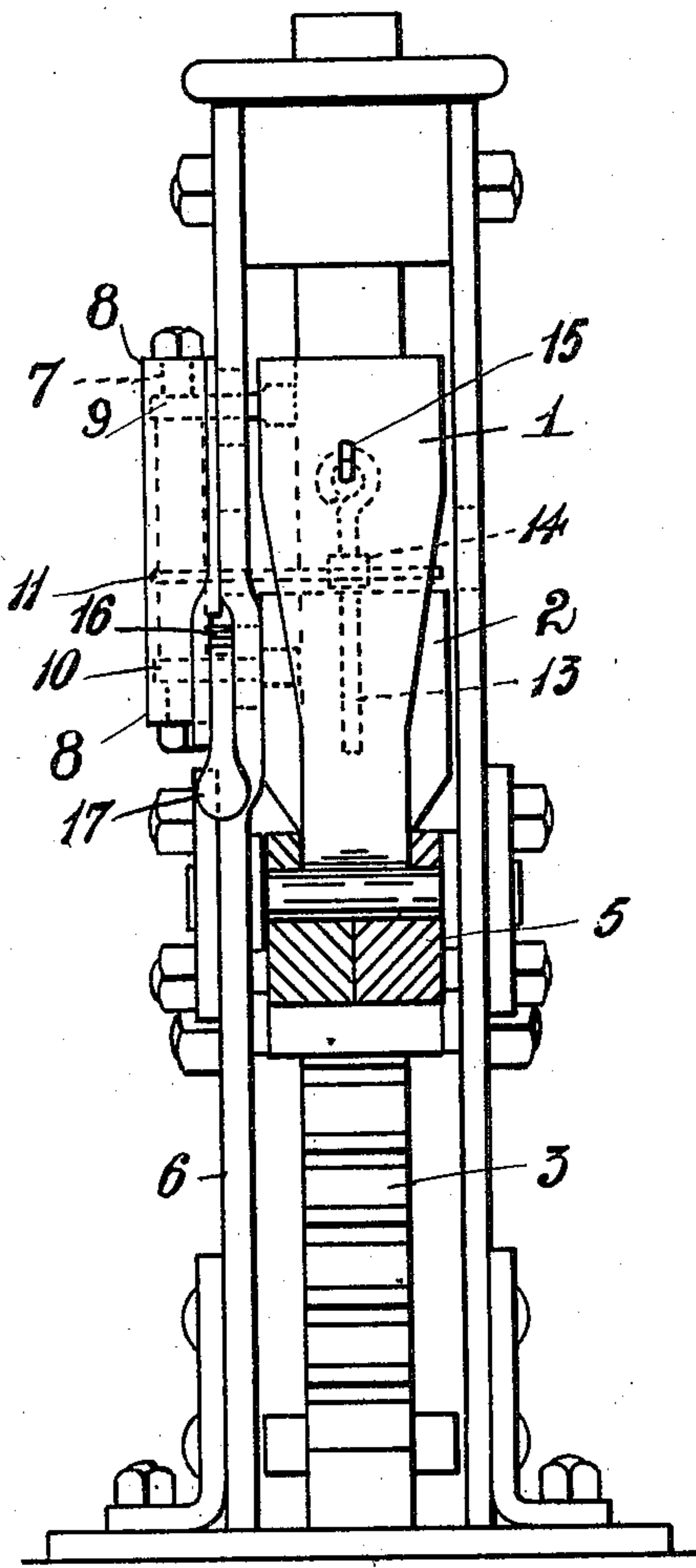


Fig. 4.

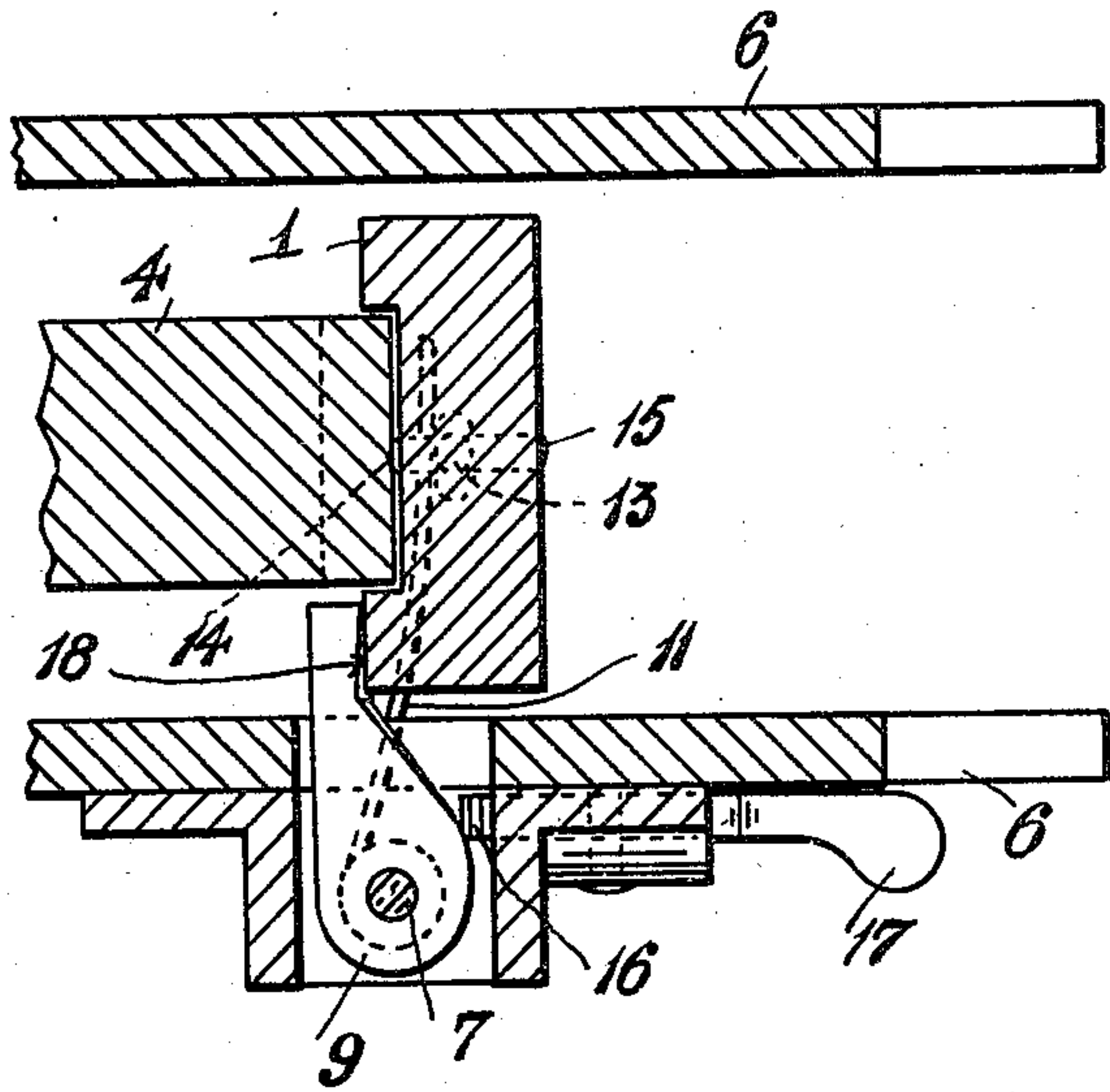
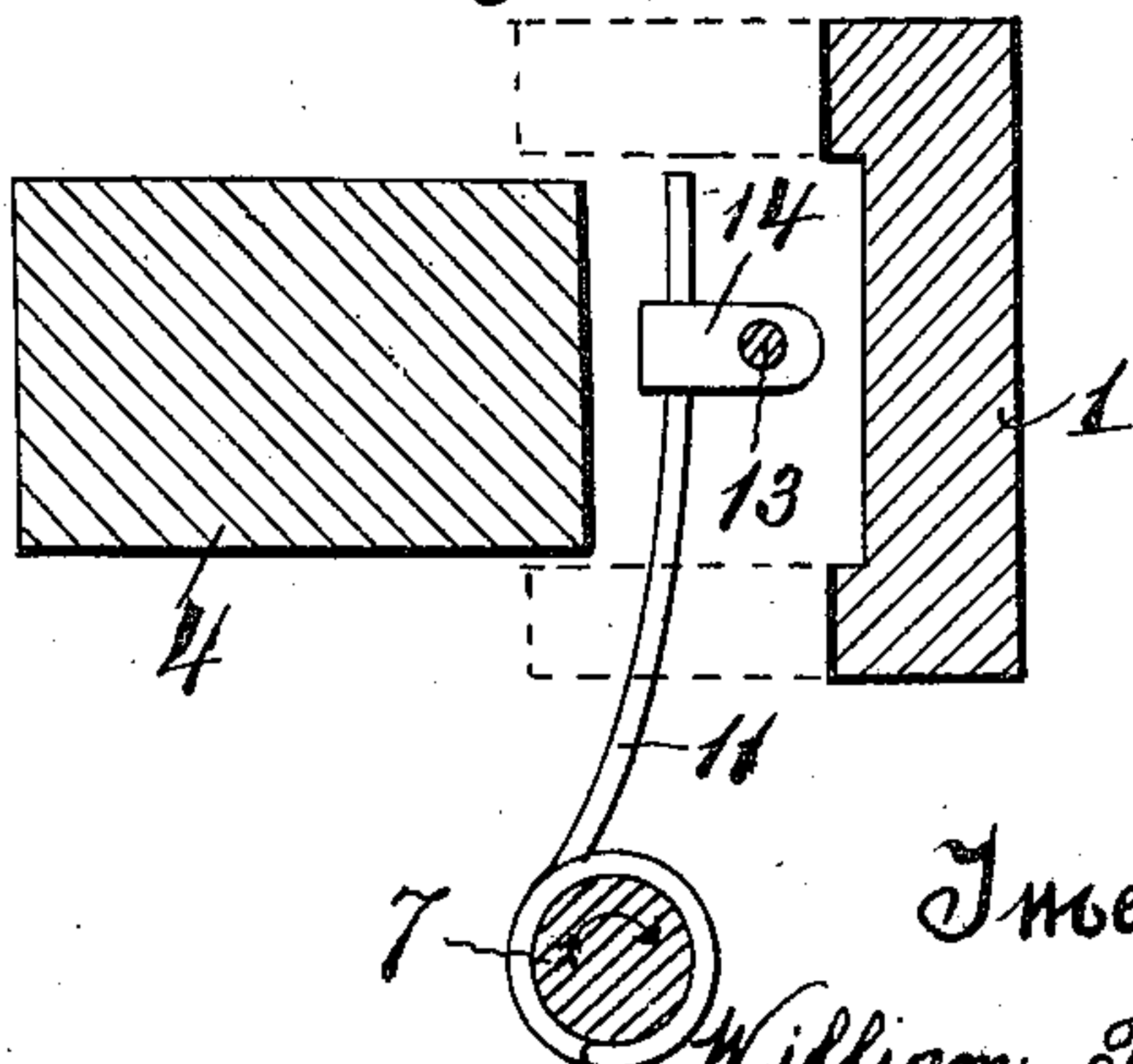


Fig. 7.



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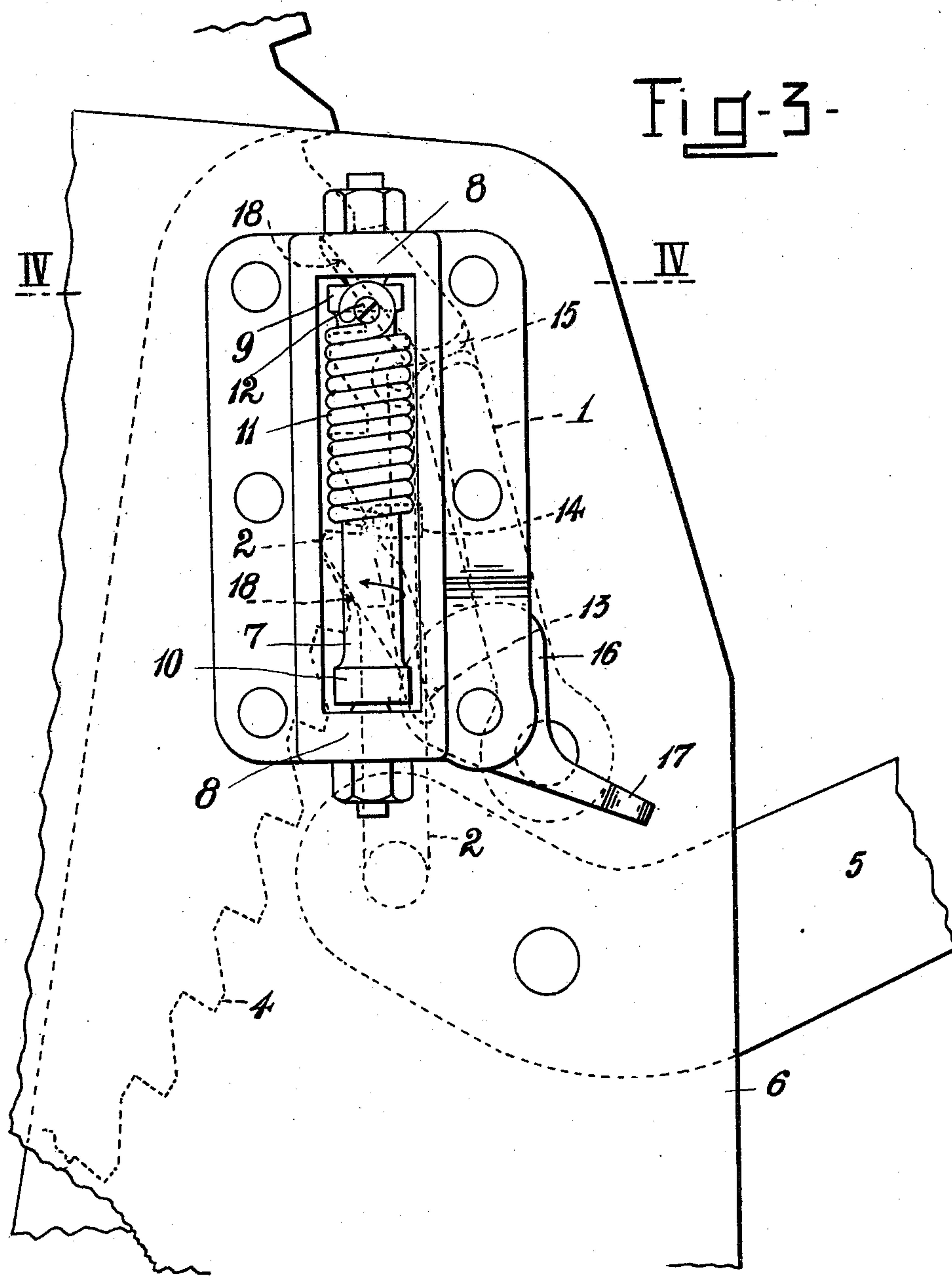
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3 SHEETS—SHEET 3.



Witnesses

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# UNITED STATES PATENT OFFICE.

WILLIAM TREWHELLA, OF TRENTHAM, VICTORIA, AUSTRALIA, ASSIGNOR TO HIMSELF AND  
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## MECHANISM FOR CONTROLLING THE PAWLS IN PAWL-AND-RATCHET MECHANISMS.

No. 862,034.

Specification of Letters Patent.

Patented July 30, 1907.

Application filed February 12, 1906. Serial No. 300,718.

*To all whom it may concern:*

Be it known that I, WILLIAM TREWHELLA, a subject of the King of Great Britain, residing at Trentham, State of Victoria, Commonwealth of Australia, have  
5 invented certain new and useful Improvements in Mechanism for Controlling Pawls in Pawl-and-Ratchet Mechanism, of which the following is a specification.

This invention relates to means for controlling the movement of pawls on racks or ratchets. It is especially  
10 applicable to the pawl and ratchet arrangement employed on lifting jacks, crab winches and the like wherein the alternate action of a pair of pawls is used to produce an intermittent lineal or rotary motion.

The mechanism comprises a simple spring device for  
15 keeping the pawls in engagement with the rack-bar or ratchet wheel during the forward or raising movement and for alternately releasing them from the notches during the backward or lowering of said rack-bar or ratchet wheel. This mechanism is equally effective  
20 whether both pawls are operating ones or whether one is an operating and the other a retaining pawl.

In the accompanying drawings which illustrate the invention, Figure 1 is a side elevation of a leverjack employing two operating pawls with the spring controlling mechanism connected thereto. Fig. 2 a rear  
25 elevation. Fig. 3 a side elevation of part of a crab winch showing the mechanism applied thereto. In this case one of the pawls is employed only as a retaining one. Fig. 4 a horizontal section on line IV—IV of  
30 Fig. 3. Fig. 5 a detail perspective view of the pawls. Fig. 6 an enlarged detail side view partly in section, Fig. 7 an enlarged horizontal section of a detail.

Referring now to the drawings, 1 and 2 designate the pawls, 3 a rack bar (Fig. 1) and 4, a ratchet wheel (Fig.  
35 3.) In the latter case the pawl 2 is fulcrumed on the operative lever 5 and is operated thereby and the other or retaining pawl 1 is fulcrumed on the casing, while in the former case both pawls are pivoted on the operating lever which latter is fulcrumed on the casing 6 of  
40 the mechanism. On one side of this casing is mounted a bracket 8, in which is journaled a vertically operated spindle 7. The axis of the spindle is approximately parallel to the rack-bar Figs. 1 and 2 and tangential to the periphery of the winch Fig. 3.

Near the upper and lower ends of the spindle is fixed  
45 a lateral arm or wiper 9 and 10 respectively. These arms are normally held in contact with the under side of each pawl by the action of a spring 11. This spring is coiled around the spindle 7 and has one end attached  
50 thereto by means of screw 12 or the like. The lower end of the spring is connected to a rod 13, at about its center by means of a short link 14. This rod is loosely connected at its upper end, by a staple 15, to the under-

side of the upper pawl 1 while its lower end bears  
55 against the back of the lower pawl 2.

On the casing 6, adjacent to the lower arm 10 is pivoted a cam 16 having a thumb-piece 17, by means of which it is rotated. When the rack-bar is to be raised, the cam 16 is thrown into contact with the lower arm  
60 10 by raising the thumb-piece 17 from the position shown in Figs. 1 and 3. This arm as swung out of engagement with the pawl 2 and the spindle 7, is rotated, carrying the arm 9 also out of engagement with pawl 1. This rotation of the spindle winds up the spring thereon  
65 and puts the spring under tension. This tensioning of the spring causes the end which is connected with the pawls to exert a pull thereon and keeps both pawls in contact with the rack so that when the operating lever  
70 5 is manipulated in the well known and usual manner the pawls are alternately raised and lowered raising the rack bar or rotating the winch. In order to lower the rack the thumb-piece 17 is pressed down into the position shown turning the cam away from the arm 10. As  
75 soon as the cam is removed from the arm 10, the spring will unwind and this unwinding rotates the spindle and the arms 9 and 10 are carried back into contact with the pawls.

As clearly shown in Fig. 6, each pawl is provided with an inclined face 18. When either pawl reaches its lowest working position, it is relieved of its load by  
80 the ascending pawl and the arm, corresponding to the descending pawl, will engage its inclined face and cause said descending pawl to swing back out of its notch. The inward pressure of the rod 13 is overbalanced by  
85 the arm of the spindle by reason of the pressure of the rod being divided between both pawls whereas the pressure of said arm is concentrated on the one pawl. The relative position of the pawls now changes, the upper pawl and load descends and the free pawl rises.  
90 While the former is descending, its inclined face contacts with the arm and forces it back against the spring. This action also frees the other arm and allows the free pawl when gaining its highest position to engage the next notch and carry the load while the other pawl is  
95 being forced out of its notch. The same cycle of movement is repeated for each notch in the downward movement of the rack.

It will be obvious that this controlling mechanism operates in a similar manner with the ratchet wheel of  
100 the winch shown in Fig. 4.

I claim:—

1. A pawl and ratchet mechanism comprising a supporting member, pawls carried thereby, a spindle in the supporting member, a spring carried by said spindle and means connecting the spring with one of said pawls.

2. Mechanism of the character specified comprising a supporting member, pivotally mounted pawls, a rod con-

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nected with one of said pawls, a spindle in the supporting member, and a spring connected to the spindle and to the ad.

- 5 3. Mechanism of the character specified, comprising a casing, pawls journaled therein, a rod loosely attached to one of the pawls, a spindle journaled in the casing, a spring attached at one end to and coiled around the spindle and secured at its other end to the rod and adapted to bear against the other pawl.
- 10 4. Mechanism for controlling the pawls in pawl and ratchet mechanism, comprising a casing, a vertical spindle journaled therein adjacent to the notches on the ratchet, a pair of wipers rigidly attached to the spindle at either end thereof, a pair of pawls having inclined faces, a rod loosely attached to one pawl and bearing against the other, a coiled spring on the spindle attached at one end thereto and connected at the other end to about the center of the rod, and a cam fulcrumed on the casing adapted to bear against one of the wipers.
- 20 5. Mechanism for controlling the pawls in pawl and ratchet mechanism, comprising a casing, pivotally mounted operating pawls, a vertical spindle journaled on the casing adjacent to the notches on the ratchet, wipers rigidly secured to the spindle and adapted to alternately engage inclined faces on the pawls, and means for throwing the wipers out of engagement with said pawls.
- 25 6. In combination with a single ratchet, a pair of pawls and means to operate the latter, of spring controlled members normally in contact with the pawls, and means to move said members out of contact with said pawls, for the purpose specified.
- 30 7. In combination with a single ratchet, a pair of pawls adapted to engage the same, and means for simultaneously raising and lowering the pawls, of spring controlled members normally in contact with the latter, and means to
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hold said members out of contact with the pawls for the purpose specified.

8. In combination with a ratchet, pawls adapted to engage the same and means for simultaneously raising and lowering the pawls, of a rotating member, laterally extending arms on the latter adapted to contact with the pawls, and means to move said arms into and out of engagement with the latter. 40

9. In combination with a ratchet, a pair of pawls adapted to engage the same and means for simultaneously raising and lowering the pawls, of a rotating member, laterally extending arms on the latter normally in contact with the pawls, and means to move said arms out of engagement with the latter. 45

10. In combination with a ratchet, a pair of pawls adapted to engage the same and means for raising one pawl and simultaneously lowering the other pawl, of a spindle, laterally extending arms on the latter normally in contact with the pawls, a spring on the spindle connected with the pawls, and means to move said arms out of contact with the pawls. 50 55

11. In combination with a ratchet, a pair of pawls adapted to engage the same and means for raising one pawl and simultaneously lowering the other pawl, of a spindle, laterally extending arms on the latter normally in contact with the pawls, a spring mounted on the spindle having one end secured thereto and its other end connected with the pawls, and a cam adapted to rotate the spindle, for the purpose set forth. 60

In testimony whereof I have hereunto set my hand in presence of two subscribing witnesses. 65

WILLIAM TREWHELLA.

Witnesses:

EDWARD N. WATERS,  
WILLIAM H. WATERS.