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PATENTED NOV. 26, 1907.

F. J. STEIN.  
RAILWAY GATE.  
APPLICATION FILED MAY 13, 1907.

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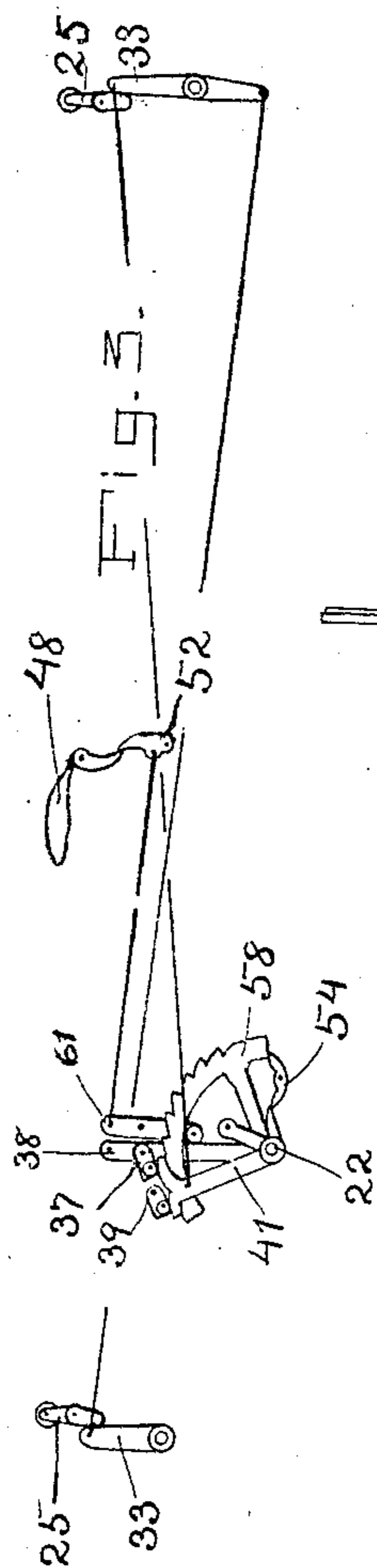
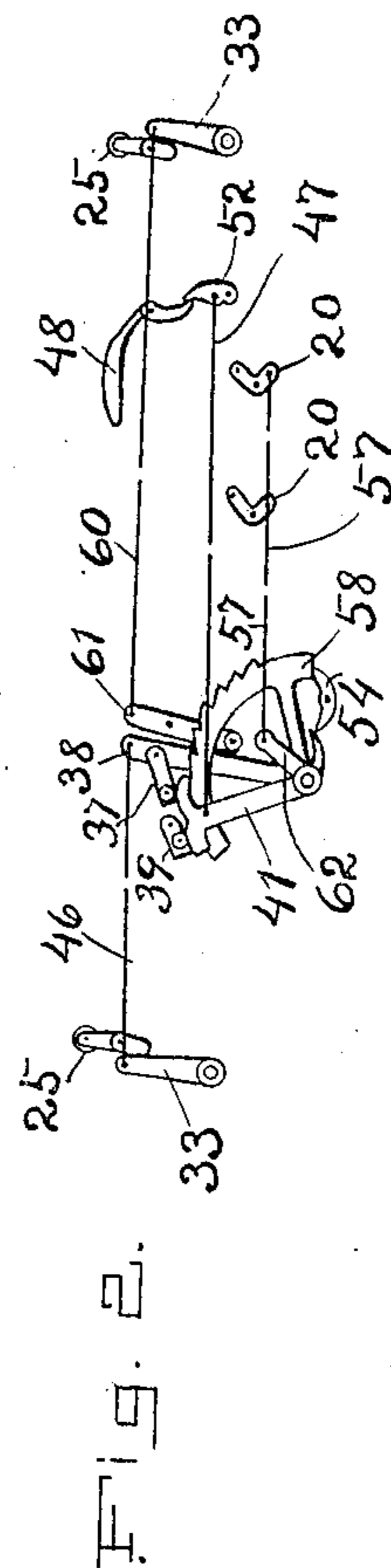
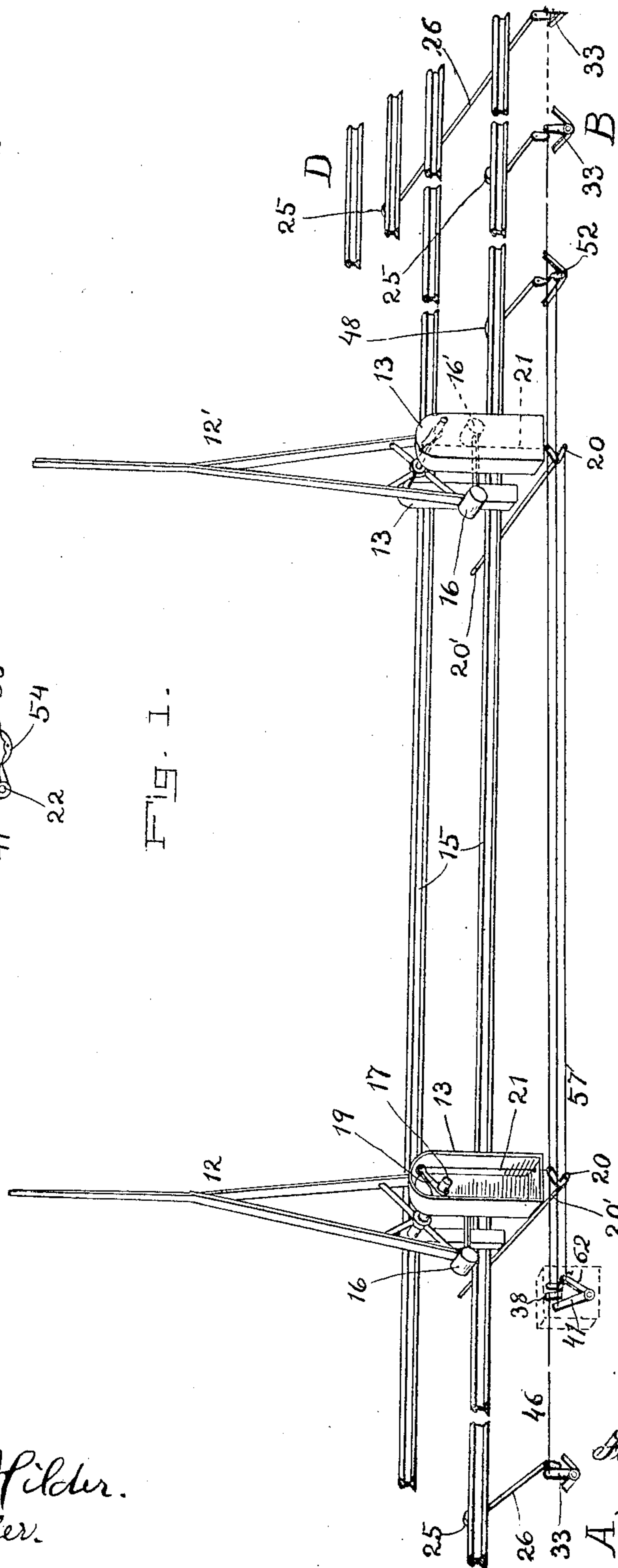


Fig. 1.



Witnesses

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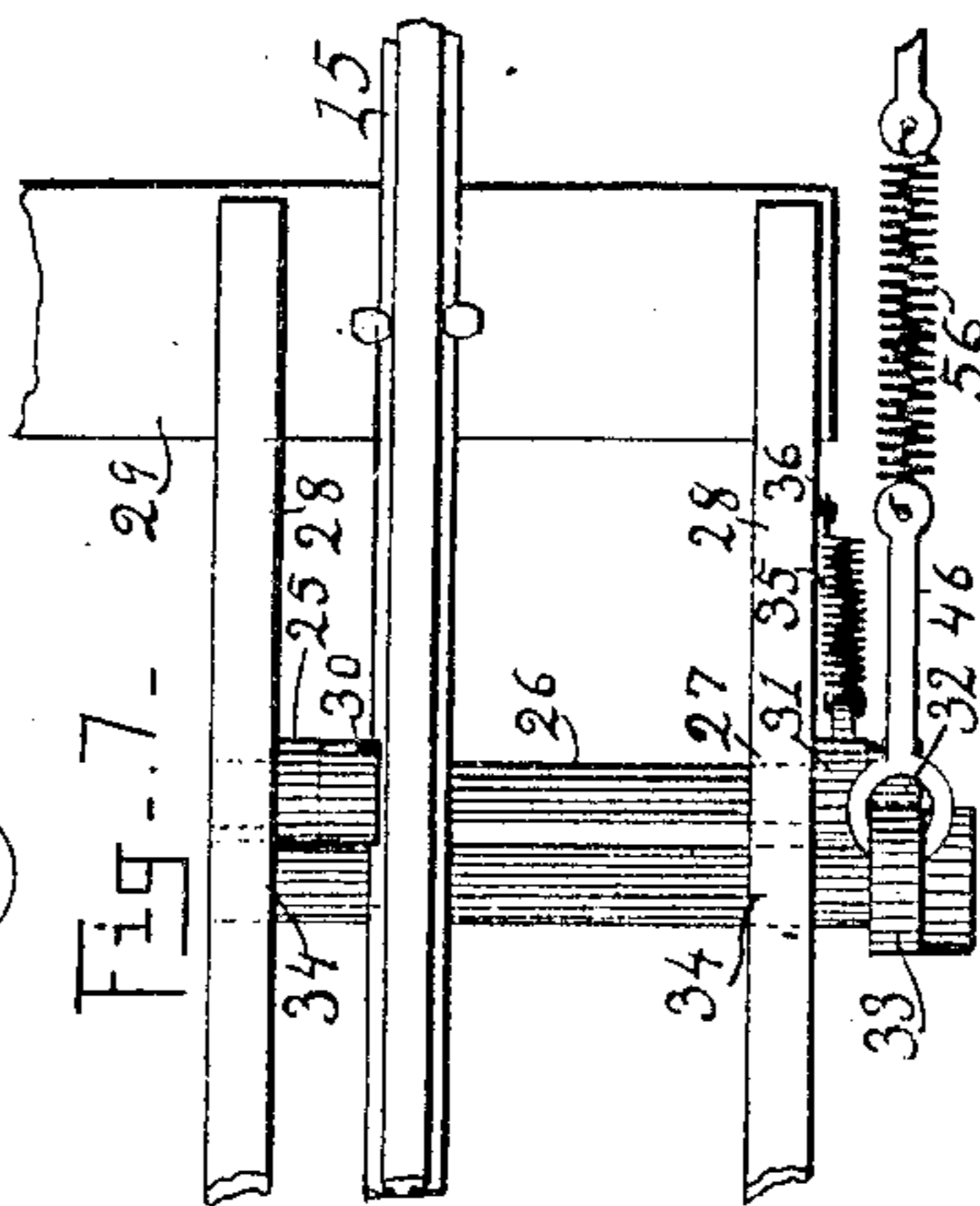
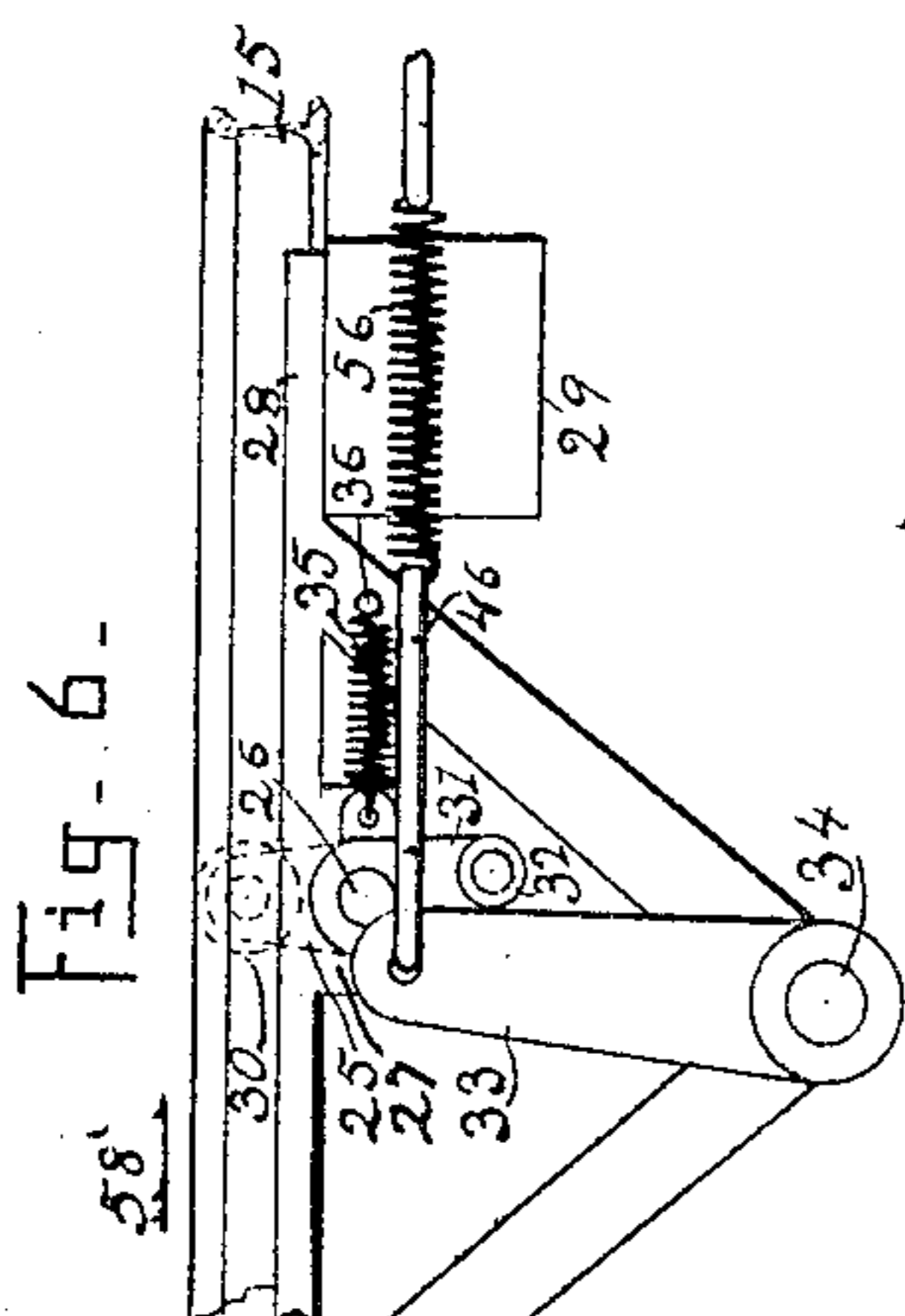
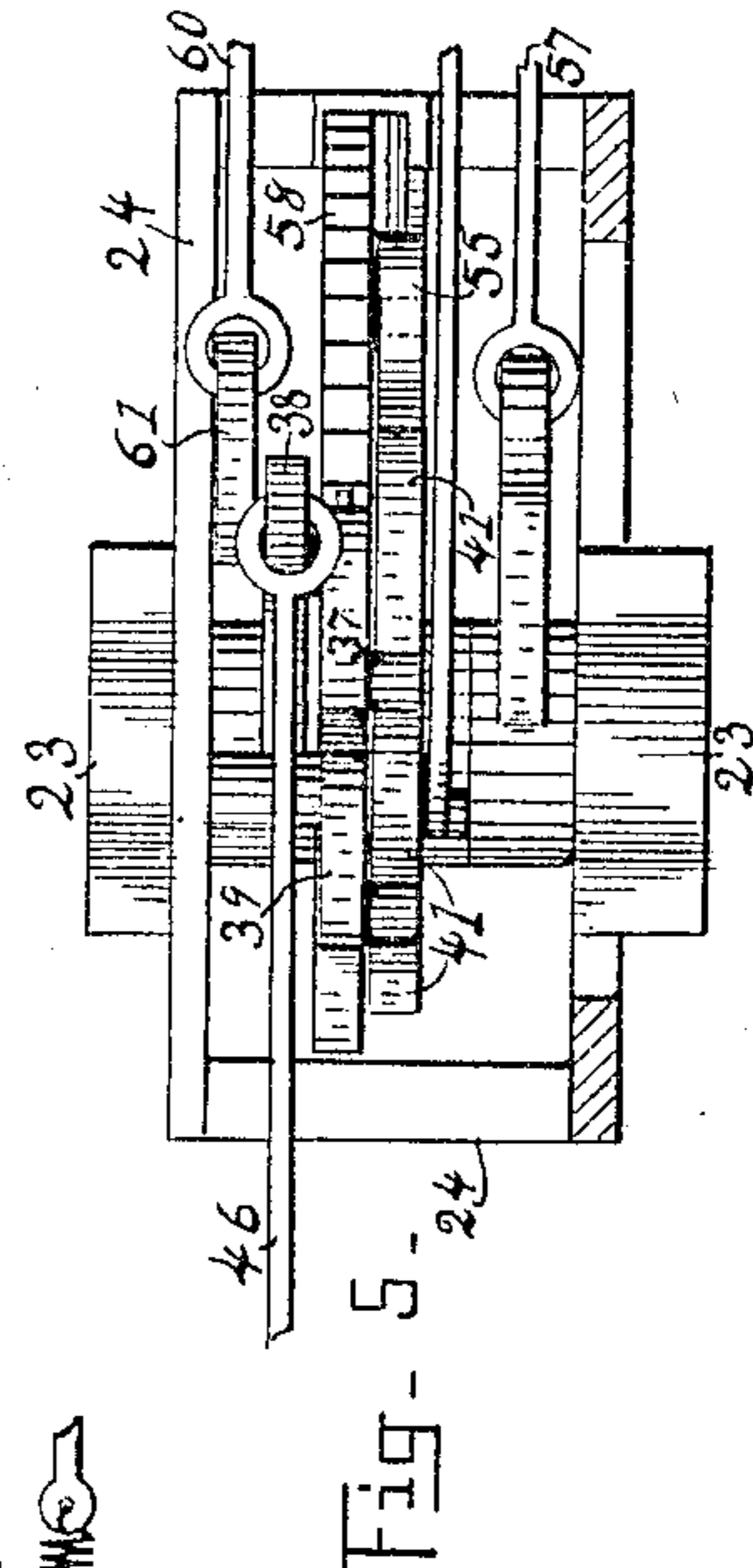
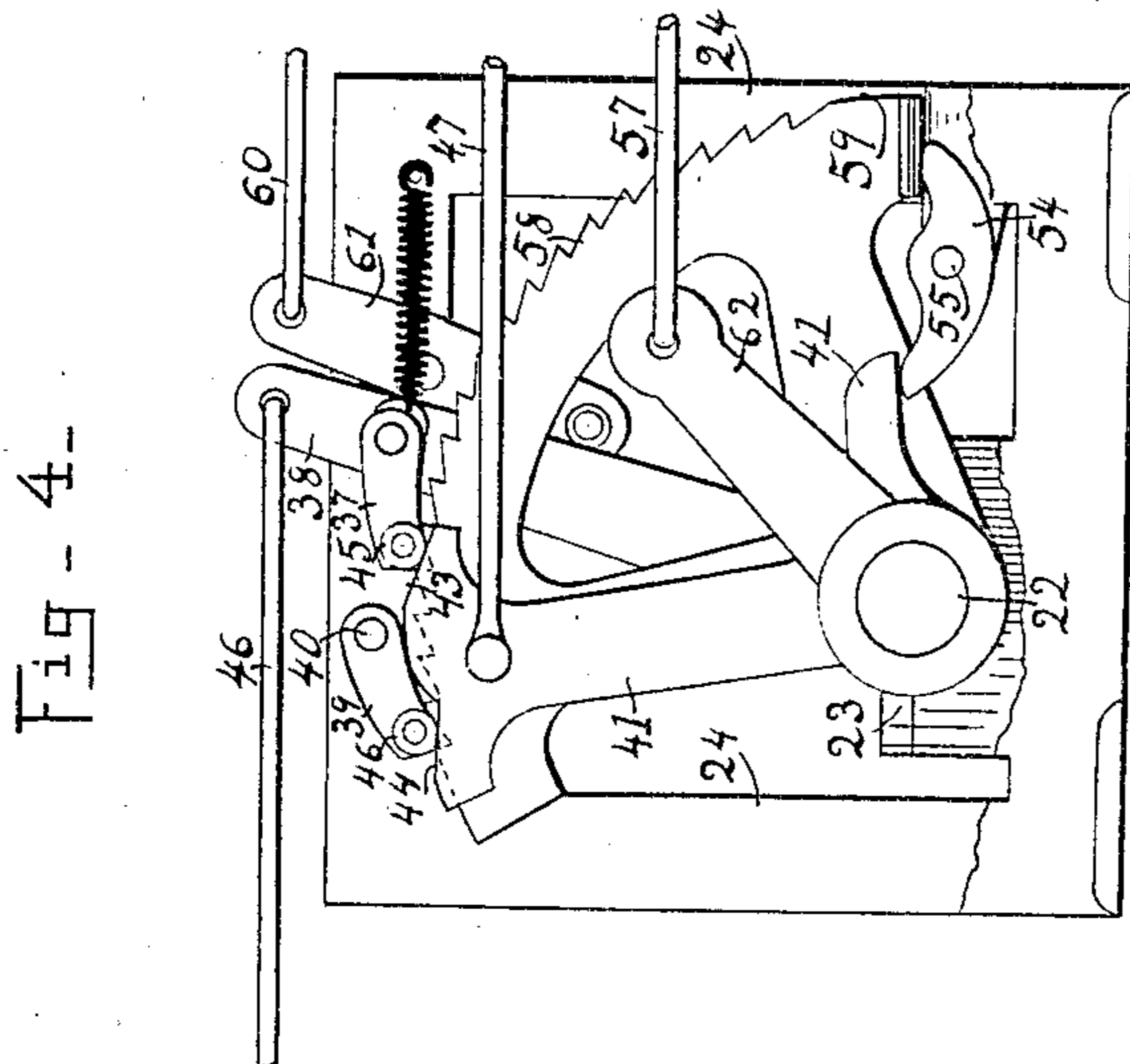
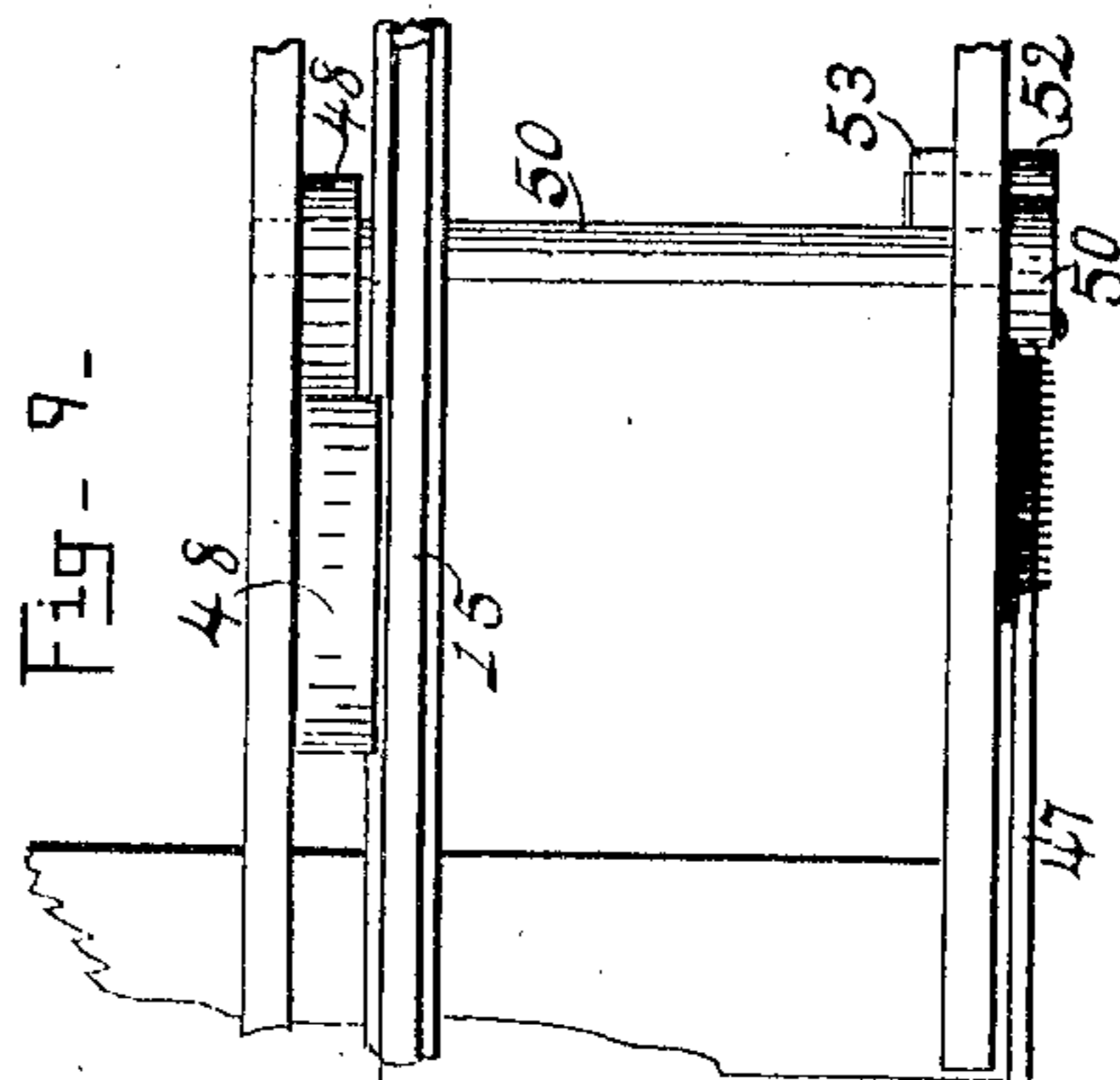
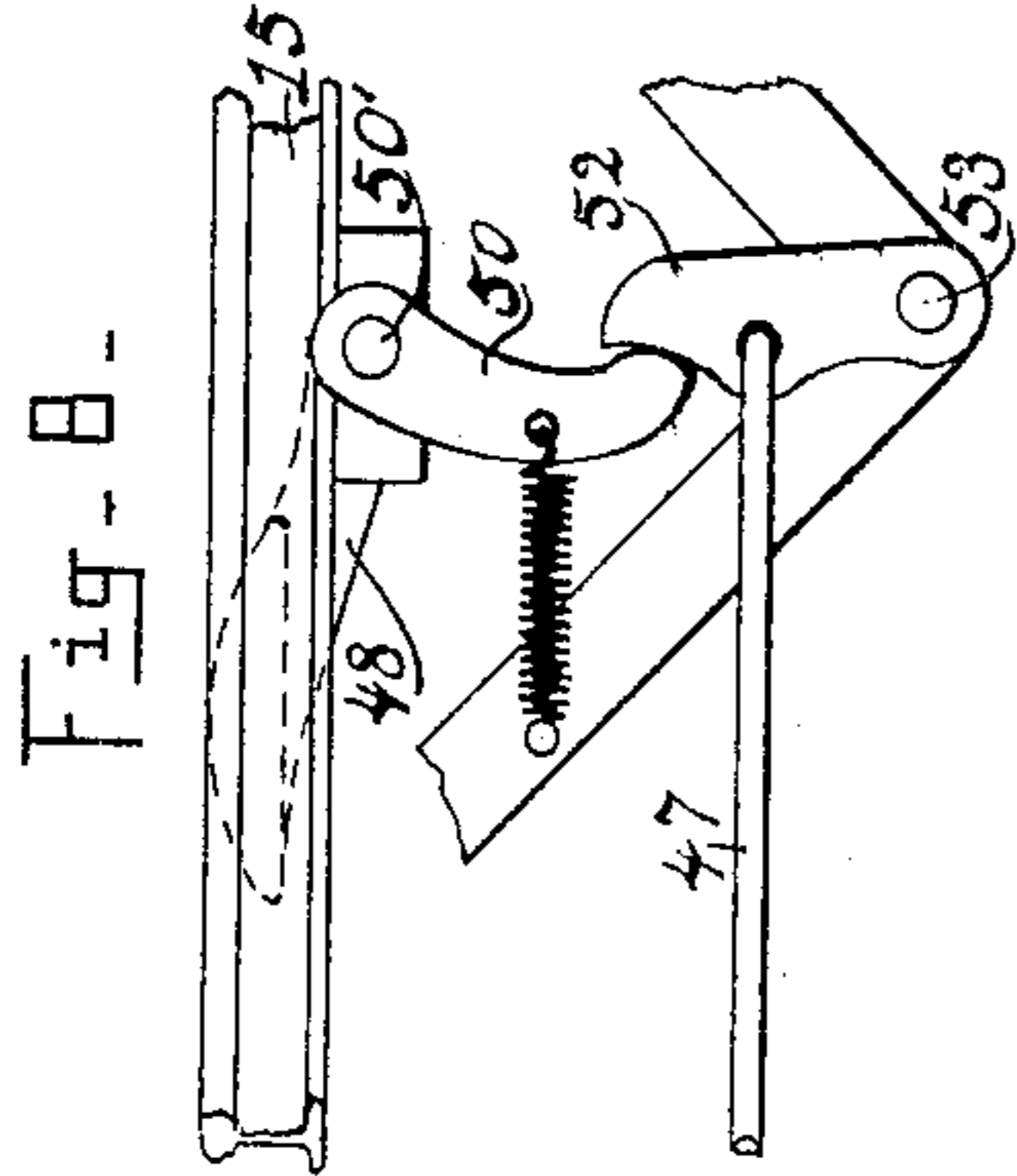
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2 SHEETS—SHEET 2.



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# UNITED STATES PATENT OFFICE.

FRANK JACUP STEIN, OF DAVENPORT, IOWA.

## RAILWAY-GATE.

No. 872,028.

Specification of Letters Patent.

Patented Nov. 26, 1907.

Application filed May 13, 1907, Serial No. 373,344.

*To all whom it may concern:*

Be it known that I, FRANK JACUP STEIN, a citizen of the United States, residing at Davenport, in the county of Scott and State of Iowa, have invented new and useful Improvements in Railway-Gates, of which the following is a specification.

This invention relates to that class of fence gates which are used to bar passage along a path or highway at a railway crossing when a train is approaching.

The object of the invention is to provide mechanical means whereby such gates may be operated automatically by passing trains, to close when a train is approaching and to open when it passes.

To this end my invention consists in the construction and combination of parts forming a railway gate hereinafter more fully described, and particularly set forth in the claims, reference being had to the accompanying drawings in which

Figure 1 is a perspective view of a pair of railway gates according to my invention; portions being broken away to bring distant parts within the view. Fig. 2 represents in side elevation some principal parts of the operating mechanism designed for closing the gates by the action of passing car wheels, and for permitting the gates to open by the action of gravity. Fig. 3 represents the same mechanism as that shown in Fig. 2, but with the connections arranged for the gates to be closed by the action of gravity and opened by the action of passing car wheels. Fig. 4 is a side view and Fig. 5 is a plan view of the gate operating machine. Fig. 6 is a side view and Fig. 7 a plan view of the actuating pedal mechanism. Fig. 8 is a side view and Fig. 9 is a plan view of the tripping pedal.

To avoid confusion I describe only one gate, any greater number being mere duplicates of the first.

Numerals 12, 12' represent a pair of gates located at the sides of a railway crossing. Each gate is mounted upon a shaft 17 which rocks in bearing posts 13 and is provided with one or more balance weights 16, 16', which overbalance the weight of the gate enough to raise the gate and to hold it in its normally raised position when the gate is not otherwise actuated.

19 represents a radial arm on shaft 17, connected with an elbow lever 20 by means of a rod 21. The elbow lever is pivoted at 20' to a permanent fixture.

15 represents a rail of the railway.

58 represents in its normal resting position a ratchet toothed segment mounted on a shaft 22 which is journaled in bearings 23 held upon any suitable fixture, such as the frame 24, so that the segment may swing to and fro through an arc of about 90°.

25 is an actuating pedal mounted on a shaft 26, that is journaled in bearings 27 fixed upon beams 28 that are fastened to the cross ties 29. The pedal 25 is provided with a roller 30 which is located beside the rail 15, in the path of passing car wheel flanges, and each passing wheel swings the pedal in the direction in which the wheel is traveling.

31 is an intermediate arm upon shaft 26, having a roller 32 which bears against an actuating lever 33 that is journaled at 34 to a fixture.

35 is a pulling spring, radially hung to the arm 31 and to a fixture at a point 36 which is the same radial line. This spring acts constantly to restore the pedal 25 to its normal vertical position whether it be swung to the right or left by passing car wheels.

37 is a pawl engaging the ratchet teeth 58 and pivotally hung upon a lever 38 which is freely journaled upon the shaft 22.

39 is a detent engaging ratchet teeth 58 and pivoted at 40 to some fixture, as frame 24.

Mounted on a shaft 22 is a lever 41 ending in a double cam 43, 44. Cam 43 is located under a roller 45 which is mounted on the side of a pawl 37, and cam 44 is located under a roller 46 which is mounted on the side of the detent 39. When lever 41 is brought into operation the two cams wedge under their respective rollers and raise the pawl 37 and the detent 39 out of engagement with the ratchet 58.

46 is a rod connecting levers 33 and 38, and 47 is a rod connecting lever 41 with a trip pedal 48 through an intermediate lever 52 an arm 50 and a rock shaft 50'. The trip pedal is located at or near the crossing and in the path of passing car wheel flanges. Lever 52 is pivoted at 53 to a fixture.

51 is a spring which acts to restore the pedal to its normal raised position every time it is depressed by a passing car wheel.

54 is a release lever pivoted at 55 to the frame 24, and having one end located in the path of the toothed segment 58, and the other end in the path of one arm of lever 41.

56 represents protecting springs located as links in the lines of connection between

parts that are acted upon by the car wheels and the mechanism that is actuated thereby. These springs serve to protect the mechanism from being broken by the sudden action of rapidly passing car wheels, the impact of which upon the pedals is almost like a hammer blow; and in case anything should prevent the movement of a gate or of other parts connected with the pedals these springs would yield enough to permit the full movement of the pedals, and yet the springs are stiff enough to perform the full function of connecting links to operate the gates under normal conditions.

57 is a rod connecting the toothed segment 58, by means of lever 62 and shaft 22, with the elbow lever of the gate. As the connecting rods 46, 47, 57 etc., have only a pulling action they may be replaced by chains, cables or other suitable devices. The actuating pedals may be located at any distance from the crossing required, to safely close the gate before the arrival of approaching trains.

In operation, a train passing in the direction of the arrow 58', hits with its wheel flanges, the roller 30 on pedal 25 and through it, communicates motion to shaft 26, arm 31, roller 32, lever 33, rod 46, lever 38, pawl 37, ratchet segment 58, rod 57, elbow lever 20, rod 21, arm 19 and shaft 17 to the gate 12, whereby the gate is gradually swung down, step by step, corresponding with the impulses given by the car wheels or trucks. If a train is passing slowly the pedal 25 will be returned to its normal position by the spring 35 after the passing of each wheel over it, so as to carry the pawl 37 over a tooth of segment 58 at each movement, but with a rapidly passing train the pedal would have opportunity to fully operate between trucks and between cars only. The detent 39 holds the segment at every tooth of advance, and when the gate is closed down a blank space 59 of the segment is reached by pawl 37 so that the continued movements of the pedal as wheels pass over it, produce no further effect on the segment. If it be a single track road a duplicate of the actuating pedal 25 and its connections, as shown at A, Fig. 3, would be located at B, but its connecting rod 60 would actuate the lever 38 through an intermediate lever 61 and a train passing towards the left would operate to close the gate. If it were a double track road the pedal 25 and its connections would be duplicated at D Fig. 1, the shaft 53 extending across under the rails. If gates are required at each side of the railway it is only necessary to duplicate the gates 12, 12', and connect them with shafts 20' extended across under the tracks, then all four gates would be closed as one through the medium of the one ratchet segment 58 whether the train comes

from the left or right. When, after having lowered the gates, a wheel of a train passes over the trip pedal 48, that pedal is depressed and communicates motion through lever 52, rod 47, lever 41 and the cams 43, 44, thereon to raise the pawl 37 and the detent 39 out of engagement with toothed segment 58, thus releasing the same so that the weights on the gates 12, 12' may raise the gates and return the segment to its normal position, as shown. Just before reaching its final resting place as shown in Figs. 2 and 3 the segment 58 engages the release lever 54 and causes it to raise the adjacent arm of lever 41, and to swing the other arm with its cams 43, 44 out of engagement with the pawl and detent, thus restoring all operative parts to their normal positions of rest, to wait for the next train. It will be seen that wheels passing either way over the tripping pedal 48 will actuate it to release the gate for closing. On the other hand, a train passing from the crossing either way as, for example, to the left at A, or to the right at B, should not close the gate, therefore the intermediate arm 31 is introduced between pedal 25 and lever 33 to permit pedal 25 to swing freely and independently of lever 33 at such times. If the gate were balanced to be closed instead of opened by gravity it would be only necessary to reverse the connections as shown in Fig. 3; connect the lever 33 to actuate the cam lever 41, thus releasing the pawl 37 and detent 39 and permitting the gate to close. The segment, striking lever 54, would actuate the cam lever 41 to drop the pawl and detent ready to act again when the gate reaches the bottom of its path, but to operate the pawl, the lever 61 is to be connected with pedal 48, then wheels coming to the crossing from either way would operate to raise the gate. The mechanism and connections may be boxed or housed in any suitable manner.

Having thus fully described my invention what I believe to be new and desire to secure by Letters Patent is the following:

1. A railway gate hung on journal bearings for up and down movement and balanced to be moved one way by gravity; a ratchet toothed segment mounted on a shaft journaled in fixed bearings; a lever hung to swing beside the said segment and a pawl on the lever to engage the segment teeth; a detent engaging the said teeth and pivoted to a fixture; an actuating pedal located beside a rail in the path of car wheel flanges and mounted on a shaft which passes under the rail; an arm fixed to the shaft; a lever journaled to a fixture to be engaged by the arm when moving in one direction; a connection between the last named lever and the pawl-carrying lever, and a connection between the gate and the toothed segment, whereby the

passing of car wheels along the said rail will actuate the gate to swing, step by step, in the direction opposed to the action of gravity.

2. The combination of a railway gate jour-  
5 naled and balanced to swing one way by the  
action of gravity; a ratchet-toothed segment  
journaled to swing in bearings, and connec-  
tions between it and the gate; a pawl and a  
detent engaging the teeth of the said seg-  
10 ment; an actuating pedal located in the path  
of a passing car wheel, and connections be-  
tween the said pawl and pedal; a double cam  
hung beside the said segment to engage both  
said pawl and detent, and a release lever lo-  
15 cated in the paths of both the said segment  
and cam lever.

3. In railway gates, a toothed segment  
mounted for reciprocating movement; an  
actuating pawl and a detent for the segment;  
a double cam mounted beside the said seg- 20  
ment to engage both pawl and detent; a re-  
leasing lever located in the paths of both the  
said segment and the cam, and connections  
substantially as shown and described.

In testimony whereof I affix my signature, 25  
in presence of two subscribing witnesses.

FRANK JACUP STEIN.

Witnesses:

R. J. WALTHERS,  
FRED ROUFFE.