

(No Model.)

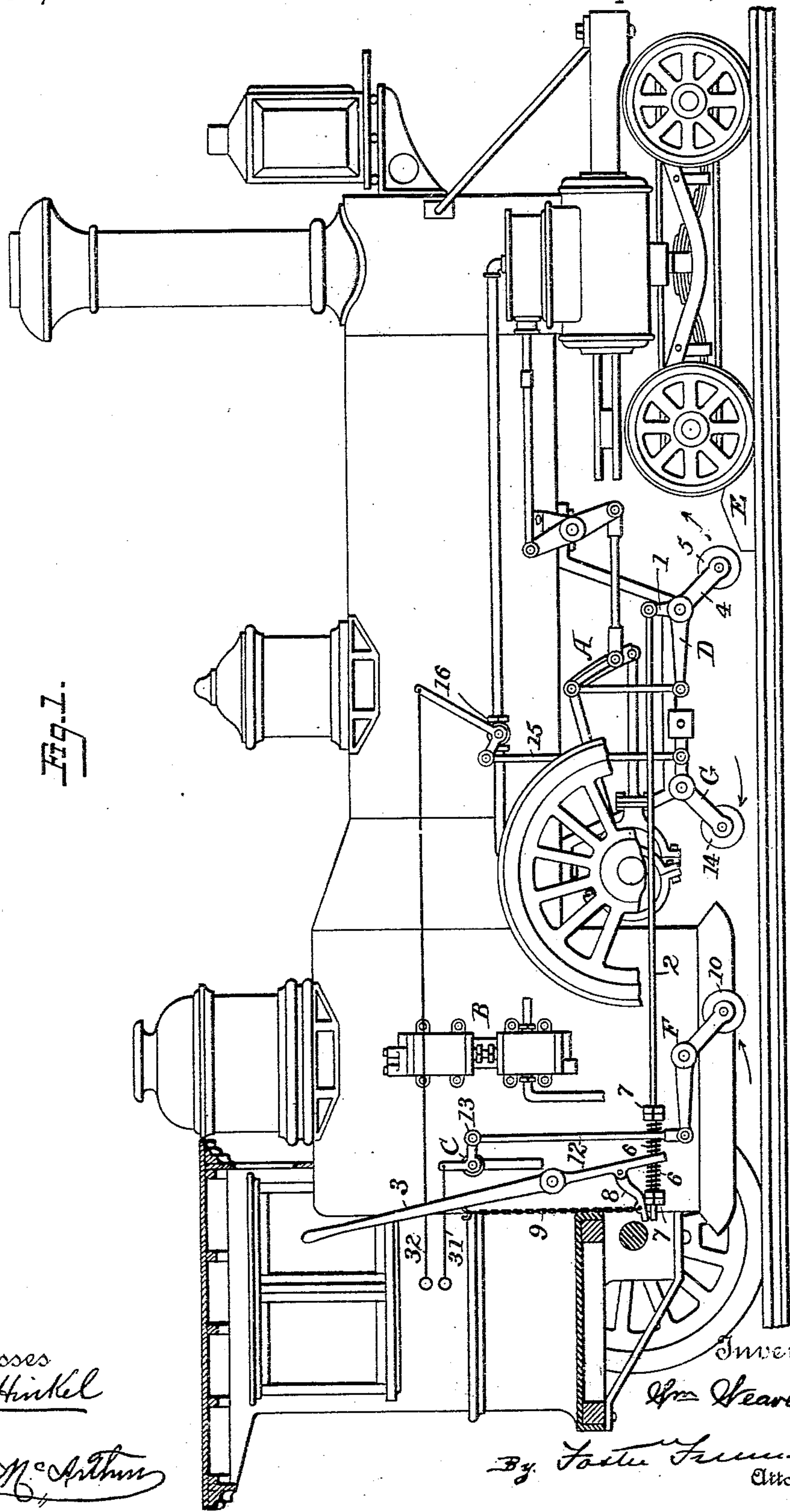
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W. WEAVER.

# AUTOMATIC REVERSING DEVICE FOR RAILROAD TRAINS.

No. 504,766.

Patented Sept. 12, 1893.



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(No Model.)

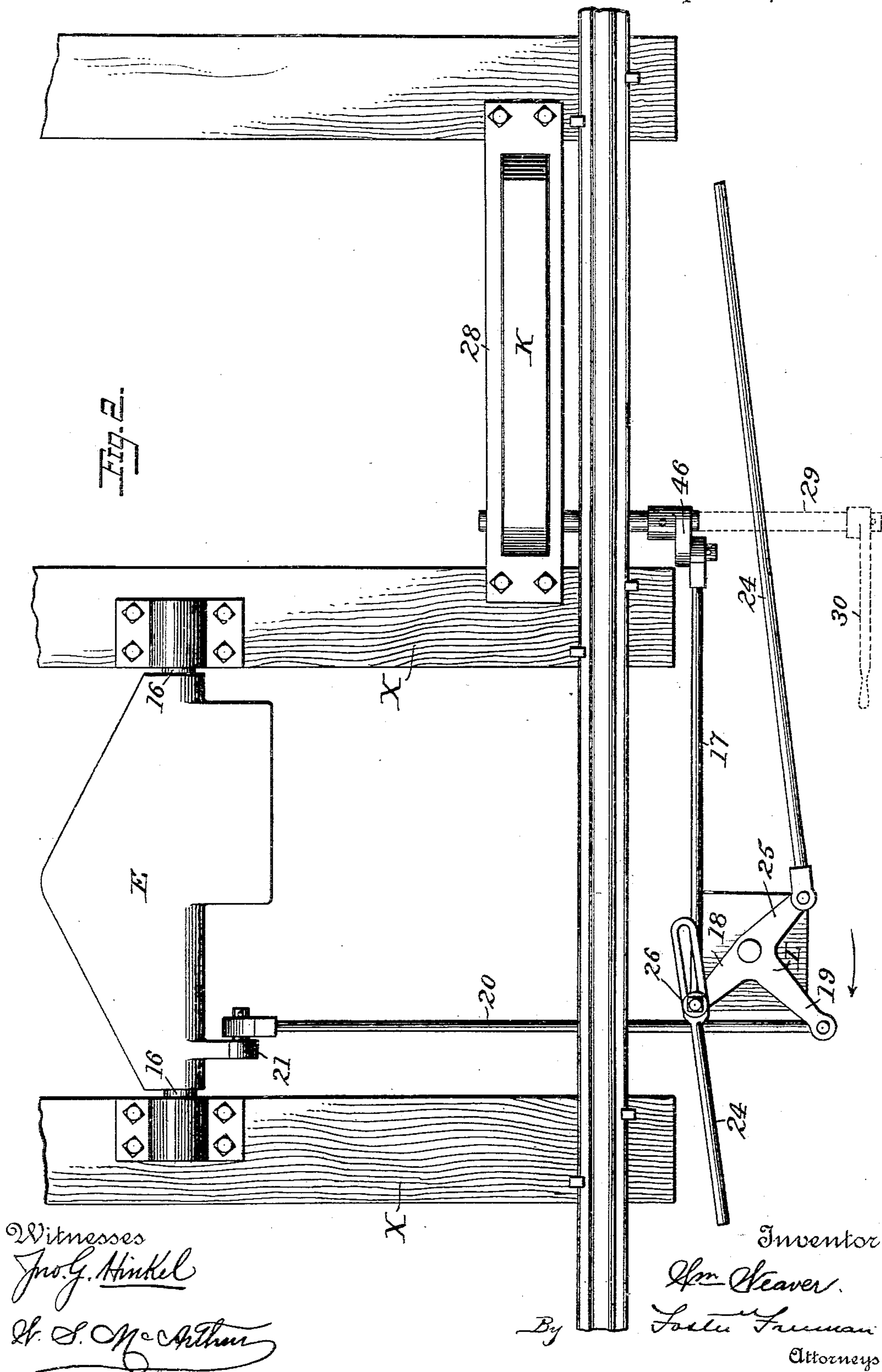
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Fig. 3.

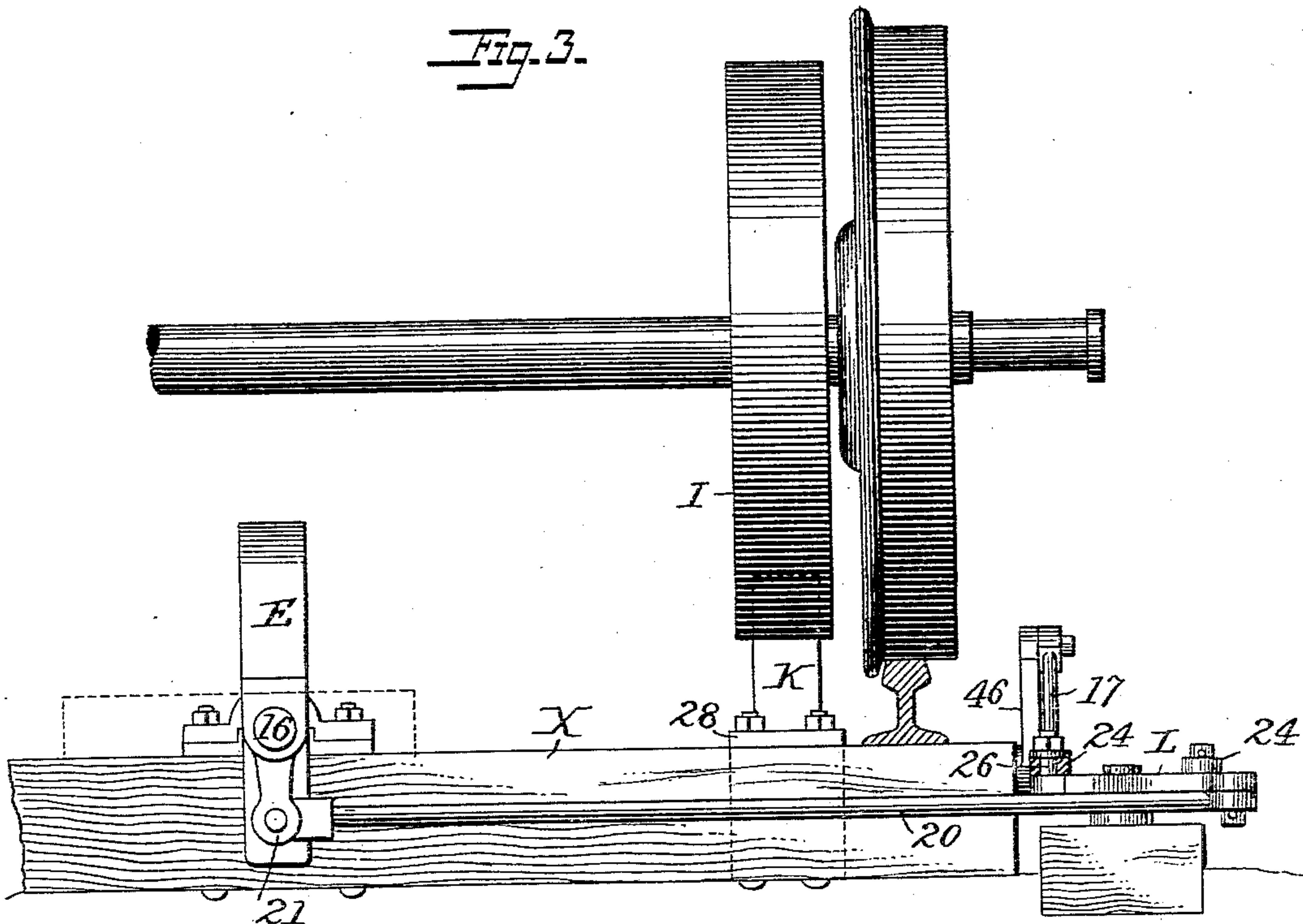
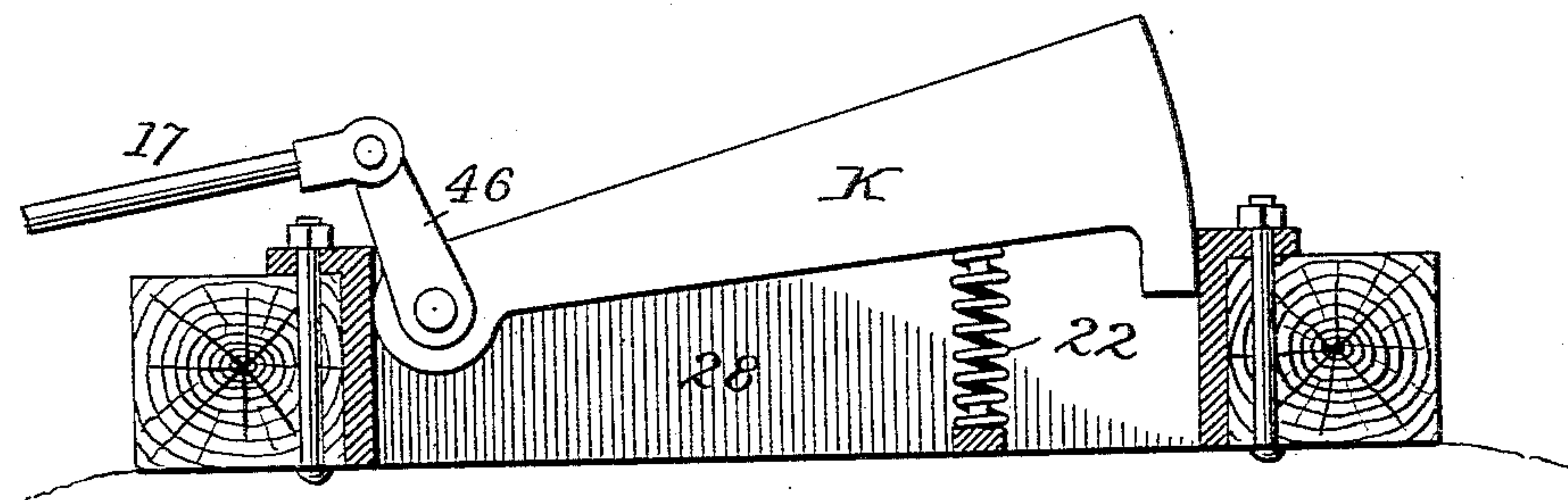


Fig. 4.



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Fig. 5.

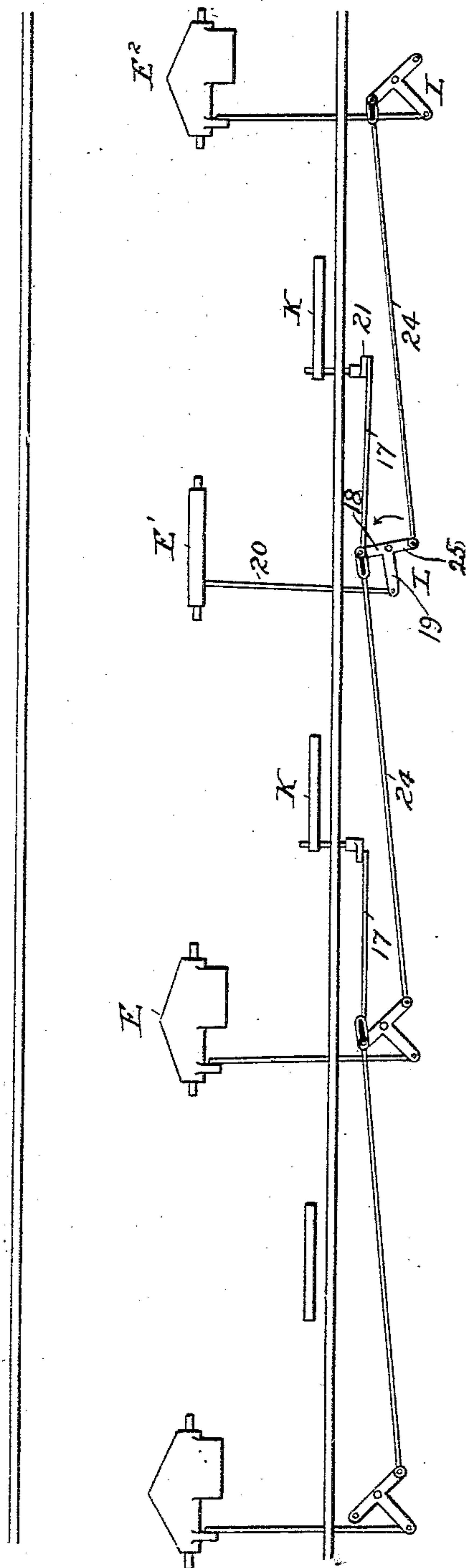
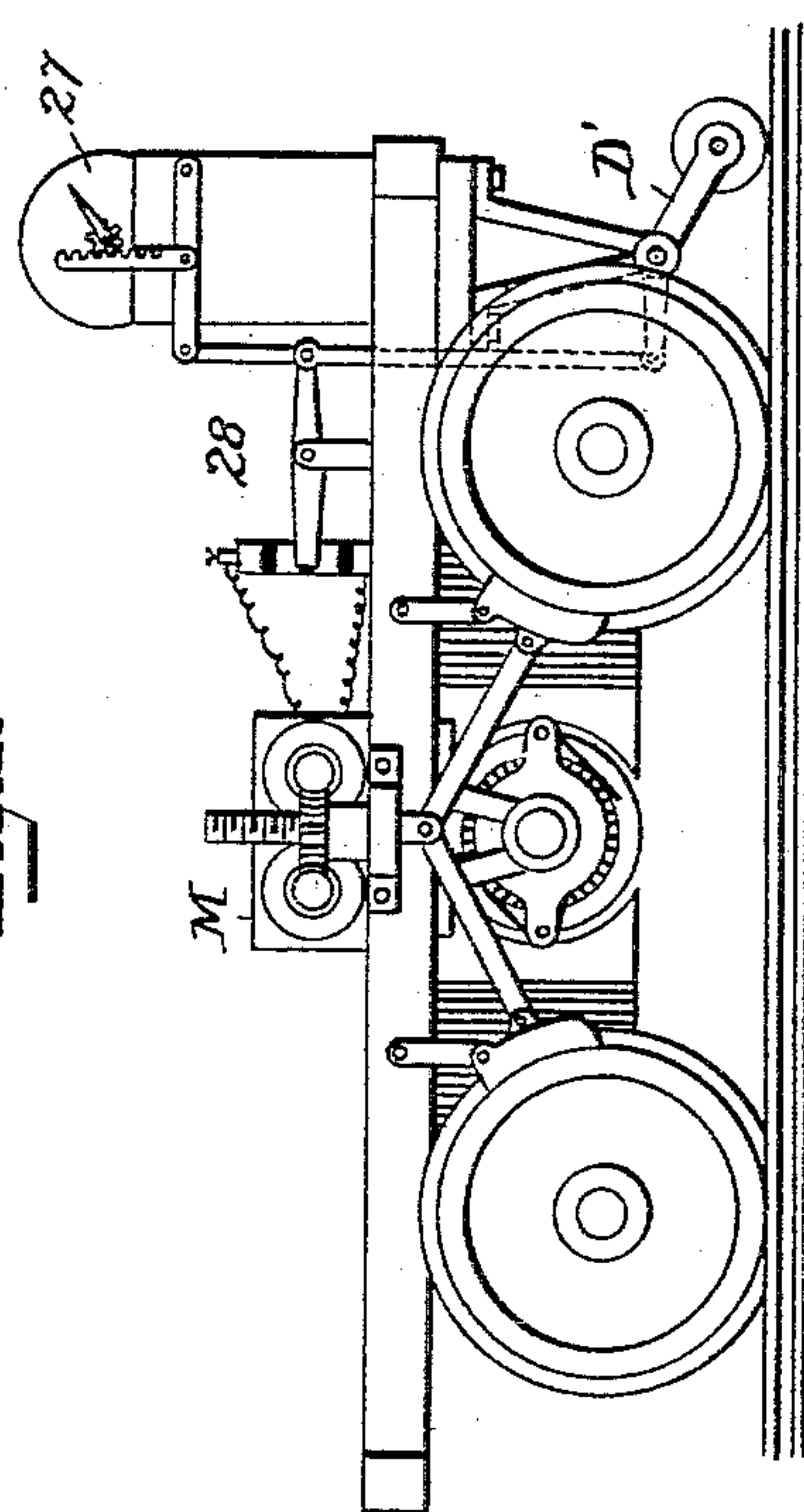


Fig. 6.



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# UNITED STATES PATENT OFFICE.

WILLIAM WEAVER, OF WESTPORT, ASSIGNOR OF ONE-HALF TO EDWIN O. KEELER AND CHARLES LAPHAM, OF NORWALK, CONNECTICUT.

## AUTOMATIC REVERSING DEVICE FOR RAILROAD-TRAINS.

SPECIFICATION forming part of Letters Patent No. 504,766, dated September 12, 1893.

Application filed October 15, 1891. Serial No. 408,766. (No model.)

*To all whom it may concern:*

Be it known that I, WILLIAM WEAVER, a citizen of the United States, residing at Westport, in the county of Fairfield and State of Connecticut, have invented certain new and useful Improvements in Automatic Brake-Setting Devices for Railroad-Trains, of which the following is a specification.

The object of my invention is to prevent automatically and with certainty the running of one train onto the section of another, and to this end my invention consists in providing the track with movable blocks or projections arranged at intervals along the entire track with means whereby each of said blocks may be brought into operative position automatically from a passing train and in providing connections between the blocks whereby upon bringing any block into position the block last passed is thrown out of position and also in providing the locomotive with appliances constructed to be operated by such blocks as are in position to thereby reverse the engine if necessary to cut off the steam and apply the brakes. These results may be effected through the medium of mechanisms of different constructions, one construction and arrangement being illustrated in the accompanying drawings, in which—

Figure 1 is a side elevation illustrating the appliances for reversing the engine and applying the brakes and sufficient of a locomotive to indicate the movement of said appliances thereon. Fig. 2 is a plan view illustrating one of the blocks or contact pieces and connected devices. Fig. 3 is an end view of one of said blocks showing also connected devices. Fig. 4 is a sectional elevation of one of the levers for actuating the blocks. Fig. 5 is a diagrammatic view illustrating the connections between the series of blocks along the road. Fig. 6 is a modification.

The engine is of any suitable construction and is provided with a reversing device A shown in the form of a link motion or otherwise suitably constructed with a brake apparatus B, the engine and pump of an air brake being shown and with a valve C, preferably independent of the ordinary brake valve so arranged that by opening said valve the brakes

of the train may be simultaneously closed or applied.

In the construction illustrated in Fig. 1, the link motion is adjusted by swinging a three branch lever D, hung beneath the engine, one arm 1, of the lever being connected by a rod 2, with the reversing lever 3, extending into the cab. Another arm 4, of the lever D, carries an anti-friction roller or wheel 5, arranged in position to make contact with the movable blocks E, of the track when the same are in operative position as described hereinafter the riding of the end of the lever over the inclined face of any block swinging the lever in the direction of the arrow Fig. 1, throwing down the link and reversing the motion of the engine. As the reversing lever 3, may be locked in its position it is necessary to provide means whereby the lever D, may be oscillated under the action of the block E, while the lever 3, is stationary yet without interfering with the accurate movement of the lever D, upon shifting the lever 3. To this end the connecting rod 2, extends through an opening in the lower end of the lever 3, and is provided with nuts or shoulders 7, 7, and with stiff springs 6, 6, one between each nut and the adjacent side of the lever 3. The springs are so stiff that when the lever 3, is swung the lever D, will be oscillated without any material lost motion, but when the lever 3, is locked and the lever D, is moved the compression of one of the springs will permit such motion. To prevent the spring from restoring the lever D, to its original position as soon as it passes the block E, I pivot to the lever 3, a pawl 8, the end of which engages one of the nuts when the connecting rod is pushed back thereby retaining the parts in place. A chain 9, extending into the cab enables the engineer to draw up the pawl and release the parts whenever required.

A lever F, provided with an anti-friction roller 10, arranged to make contact with the blocks E, is connected by a rod 12, with the handle 13, of the valve C, so that when the lever is swung in the direction of its arrow by contact with a block the actuating fluid will be transmitted to the brake devices or allowed to escape in such manner as to apply the



brakes. In some instances I also make use of a third lever G, carrying an anti-friction roller 14, and arranged in position to make contact with the blocks E, and connected by a rod 15, with the handle of a steam valve 16, controlling the communication between the steam boiler and the cylinders, so that when the lever G, is swung in the direction of the arrow by contact with the block the steam will be cut off from the cylinders.

By the arrangement of parts above described whenever a block E, is in operative position so as to be struck by the lever or levers or other contact pieces carried by the locomotive the admission of the steam to the valve chest will be so changed as to reverse the engine. Then if the lever G is used the steam will be cut off and then the brakes will be applied. If the lever G, is not used the engine will be reversed and the brakes will be applied without cutting off the steam so as to secure the greatest possible resistance to the onward movement of the train.

The blocks E, may be of any suitable construction and movable in any suitable manner so as to be brought in any position to be struck by the levers upon the locomotive or placed so as to escape contact therewith, but I prefer to arrange the blocks at such a distance apart as will prevent one train from coming into dangerous proximity to another, to set each block in operative position by a passing train and to turn it back to an inoperative position as the train passes the next block.

Different means for connecting the blocks will occur to any skilled mechanic, one construction and arrangement being shown in detail in Figs. 2 to 4. As shown, each block E, swings upon trunnions 16, 16, turning in bearings upon the ties X, X, and is counterweighted so as to turn readily to any position and one edge is beveled from both ends as shown, so that the rollers of the levers or other contact pieces will ride readily up the beveled edges, whatever may be the direction in which the engine is running. As thus supported each block will be in an operative position when it is vertical as indicated in Fig. 3 and will be inoperative when horizontal as shown in Fig. 2.

In order that each block E, may be set into vertical position as soon as a train passes the said block I provide each train with a contact piece I, preferably in the form of a wheel upon the axle of the rear car. For this purpose each car may have upon each end axle a wheel I, capable of being adjusted to proper position to make contact with appliances for shifting the positions of the blocks E. As shown, each block E is shifted by means of a lever K, pivoted adjacent to the track and having an arm 46 connected by a rod 17, with one arm 18 of a horizontal T-lever L, and another arm 19 of said lever is connected by a rod 20, with an arm 21, of the block E. When a lever K, is depressed by a wheel I,

the lever L, is swung in the direction of its arrow and the block E, is turned to a vertical position, and as the said block is arranged with its trunnions in a line parallel to the track there is no tendency to displace the block by the contact therewith of the parts carried by the engine, while it can be swung laterally out of position by the exertion of but little force which is very desirable when the said block must be shifted from a point a mile or so distant. It will further be seen that by supporting the blocks upon trunnions I avoid the difficulties incident to obstructions by snow and ice which would interfere with a sliding movement to a greater or less extent.

In order to prevent the lever K, from being jammed by ice or snow I prefer to pivot it in a box 28, in which the lever can move vertically and the lever is supported by a spring 22, of sufficient strength to at least counterbalance the weight of the lever.

Each block is shifted from the next station in advance through the medium of a connecting rod 24, attached at one end to the arm 25, of one lever L, and slotted at the other end to receive a stud 26, upon the arm 18, of the lever L, at the said advance station. This permits of a certain amount of lost motion necessary to allow any block, (as E', Fig. 5,) to be swung to a vertical position without thereby moving or being restrained by the devices of the station to the rear. At the same time the connecting rod 24, extending to the next station ahead is moved to such a position that when the block E<sup>2</sup>, is turned to its vertical position the draft upon said rod 24, and the swinging lever L, of the block E', is in the direction of the arrow, Fig. 5, and the block E', will be turned down to a horizontal position without thereby interfering with the position of the block E, in the rear of E'. By this arrangement each train upon passing a station sets the block at that station in position to actuate the reversing and stopping devices of any train that may enter the section before the first train reaches the next station in advance, but when the forward train passing the next following block sets it in operative position, it will at the same time re-set the preceding block to its normal position. Thus should a following train enter any section occupied by the first train it will be automatically arrested in the manner before described.

Where the motive power is electricity the lever D', of the electro-locomotive may be connected with the arm of a reversing switch 27, constructed in any well known manner and may also be connected with a switch 28, controlling the current to a motor M, that applies the brakes.

I do not describe the details of the electric switch and electro-motor as I propose to use any of the well known forms in use.

It will be evident that by shifting the positions of the blocks E, by hand a person near the track may arrest an approaching train



which may be necessary in the case of an engine running wild or where the engineer cannot be signaled. One means of effecting this is to provide the pivot shaft 29, of the lever 5 K, with a hand lever 30, as shown in dotted lines Fig. 2. It will be of course understood that after the engine has been reversed automatically as described it will still be within the control of the engineer who may operate 10 the lever 3, and the valves C, and 16, by rods 31 and 32 extending into the cab and connected with the arms or handles of the valves.

Without limiting myself to the precise construction and arrangement of parts shown 15 and described, I claim—

1. The combination with a railroad bed provided with blocks of a locomotive provided with reversing mechanism, a contact piece connected with the reversing mechanism and 20 arranged in position to make contact with and be shifted by said blocks, substantially as set forth.

2. The combination with the reversing devices of a locomotive, of a contact piece connected with said devices and arranged in position to make contact with blocks or projections upon the road bed, substantially as 25 set forth.

3. The combination with a series of blocks 30 dividing a road-bed into sections, each block

being connected with a lever, and connecting rods between adjacent levers, of a locomotive provided with reversing and stopping devices and with contact pieces connected with said devices and arranged in position to make con- 35 tact with said blocks, whereby the locomotive may be prevented from passing into an occupied section, substantially as described.

4. The combination of the series of blocks, each connected with a lever and a connecting 40 rod between each two levers connected to permit a movement of one lever independently of the other, substantially as set forth.

5. The combination of the series of blocks E, series of levers K, and levers L, each con- 45 nected to one of the blocks and one of the levers K, and connecting rods 24 between the levers L, connected to permit one lever to move in one direction independently of the other, substantially as set forth. 50

6. The combination of the blocks E, and their operating levers K, and boxes 28, for the levers K, substantially as set forth.

In testimony whereof I have signed my name to this specification in the presence of 55 two subscribing witnesses.

WM. WEAVER.

Witnesses:

CHARLES E. FOSTER,  
ALLE N. DOBSON.