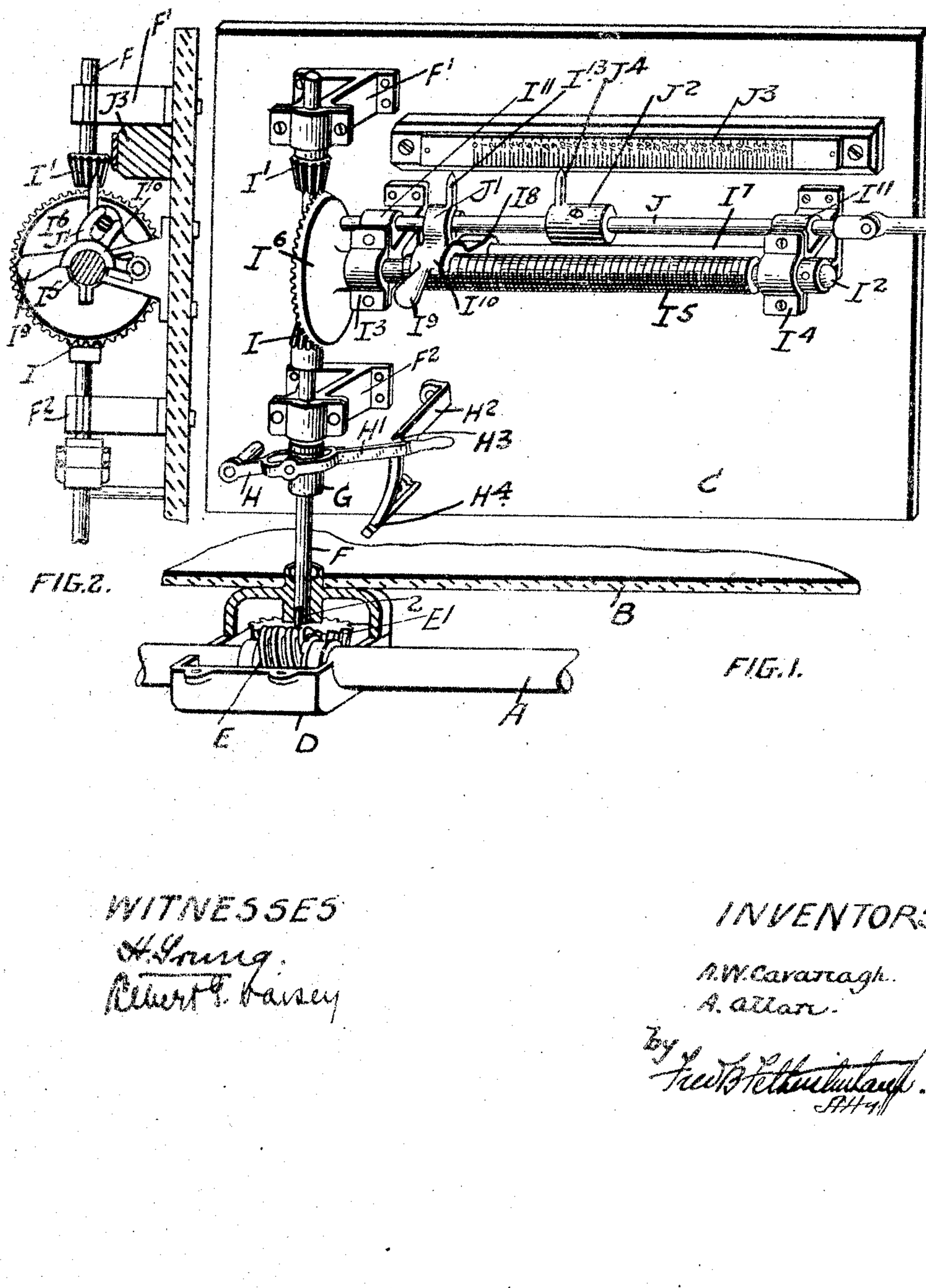
No. 883,293.

PATENTED MAR. 31, 1908.

A. W. CAVANAGH & A. ALLAN.

AUTOMATIC TRAIN BRAKE APPLYING DEVICE.

APPLICATION FILED DEC. 4, 1907.



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AUTOMATIC TRAIN-BRAKE-APPLYING DEVICE.

No. 883,293. Specification of Letters Patent. Patented March 31, 1908.

Application filed December 4, 1907. Serial No. 405,123.

To all whom it may concern:

Be it known that we, ALONZO WATSON CAVANAGH and ARTHUR ALLAN, railway employees, both of the town of North Bay, in the district of Nipissing, in the Province of Ontario, Canada, have jointly invented certain new and useful Improvements in Automatic Train-Brake-Applying Devices, of which the following is a specification.

Our invention relates to improvements in automatic train brake applying device and the object of the invention is to provide a device which may be set by the conductor of a train to automatically apply the brakes at any given distance from the station at which the train orders are received and it consists essentially of a threaded spindle driven from one axle of the car, a longitudinally movable shaft supported in bearing and connected to the air valve of the train pipe, a scale bar suitably graduated, a pointer secured to the longitudinally movable bar, a nut movably supported upon the threaded spindle and also provided with a pointer and means for reversing the rotation of the spindle upon the train reversing its movement as hereinafter more particularly explained by the following specification.

Figure 1, is a general perspective view of our device. Fig. 2 is a vertical section through Fig. 1.

In the drawings like letters of reference indicate corresponding parts in each figure.

A is the axle of the car, B is a portion of the floor thereof, C is a back board on which the mechanism for automatically applying the brake is supported.

D is a gear casing suitably supported about the axle A and to the bottom of the car.

E is a worm secured to the axle and within the casing D.

F is a vertical spindle secured in the bearings F′ and F² and in the base of the gear casing which forms a step bearing therefor.

E′ is a worm gear slidably connected to the spindle F by the feather key 2.

G is a grooved sleeve secured to the spindle F.

H is a pivoted lever the fork of which extends into the groove of the sleeve G. The lever H is provided with a spring handle H′.

H² is a quadrant provided with the right angular notches H³ and H⁴ with which the spring handle H′ coacts.

I and I′ are bevel gears secured to the spindle F.

I² is a horizontal spindle supported in the bearings I³ and I⁴. The spindle I³ is provided with a threaded portion I⁵ and a bevel gear I⁶.

I⁷ is a stationary bar suitably secured in the bearing brackets I³ and I⁴.

I⁸ is an arm swung on the bar I⁷ and longitudinally movable thereon. The outer end of the arm I⁸ is provided with a semicircular segmental nut I¹⁰ the internally threaded portion of which is designed to normally rest upon and engage with the threaded portion I⁵ of the spindle.

I⁹ is a handle by which the arm I⁸ may be swung upwardly to through the portion I¹⁰ out of engagement with the threaded portion of the spindle I².

J is a longitudinally movable rod held in bearings I¹¹ forming part of the bearing brackets I³ and I⁴.

J′ is a fork extending from the portion I¹⁰. The fork J′ is arc-shaped and formed concentric to the center of the bar I⁷.

J² is a sleeve adjustably secured to the rod J. The rod J is suitably connected to the train line valve and the longitudinal movement of the rod is designed to open the valve.

J³ is a scale bar suitably divided preferably into miles and half miles. The sleeve J² is provided with a portion J⁴ and the movable nut I¹⁰ is provided with a pointer I¹³.

Having described the principal parts involved in our invention we shall briefly describe the operation of the same. The conductor as soon as he receives his train orders upon leaving a station sets the mechanism in accordance therewith by moving the sleeve J longitudinally on the bar J² so that the pointer J⁴ indicates on the scale bar J³ the number of miles away from the station at which it is desired to apply the brakes. The pointer being shown in the drawing at the ten mile indicating mark, the sleeve being secured in that position. The pointer I¹³ of the movable nut I¹⁰ is placed opposite the zero mark of the scale bar. The spindle F is driven from the axle A through the worm gear E and E′. The spindle I² is rotated through the gear I and I⁶ thereby gradually feeding the nut I¹⁰ longitudinally on the spindle towards the stationary sleeve J² at a speed proportionate to the rate of travel of the train. Upon the pointer I¹³ also reaching the ten mile indicating mark the fork J′ strikes the sleeve J² moving it and the rod J longitudinally thereby opening the train valve

and applying the brakes. When the train moves in the opposite direction the spring handle of the lever H′ is relieved from the notch H^3 and depressed until it rests in the notch H^4 and thereby lowering the spindle F and bringing the bevel pinion I′ into engagement with the gear I^6 and carrying the gear I out of engagement with the gear I^6 so that the spindle I^2 will be driven in the same direction no matter which way the train is moving.

From this description it will be seen that we have provided a simple mechanism whereby the brake of a train may be automatically applied at any desired distance from the station at which the conductor receives his train orders.

What we claim as our invention is:

1. In an automatic brake applying device, the combination with the train valve and the car axle of a movable member operated from the car axle, a slidable member adjustably and normally supported at a distance from the movable member and connected to the train valve and means operated by the axle for gradually moving the movable member into contact with the slidable member to move the same, as and for the purpose specified.

2. In an automatic brake applying device, the combination with the train valve and the car axle, of a graduated scale bar, a longitudinally slidable bar connected to the train valve and provided with a pointer coacting with the scale bar, a threaded spindle parallel to the said bar, a nut therein designed to be fed longitudinally over the threaded spindle into contact with the pointer and means operated by the axle of the car for rotating the spindle as and for the purpose specified.

3. In an automatic brake applying device, the combination with the train valve and the car axle, of a graduated scale bar, longitudinally movable slide bar, a stop adjustably secured thereto, a pointer on the stop coacting with the scale, a threaded spindle supported parallel to the bar and in suitable bearings, a rod parallel to the threaded screw spindle, an arm swung on the rod, a segmental nut forming part of the arm and meshing with the threaded spindle and designed to engage with the stop on the slidable bar and means for rotating the spindle from the axle as and for the purpose specified.

4. In an automatic brake applying device, the combination with the train valve, car axle, scale bar, threaded spindle, the nut meshing with the spindle and the stop on the bar, of a worm on the axle, a vertical movable shaft, a worm gear slidably held therein, a bevel gear on the threaded spindle, a pair of bevel pinions on the vertical shaft and designed to be alternately brought into engagement with the bevel gear by the vertical movement of the shaft and a suitable lever and rack designed to give such vertical adjustment to the shaft as and for the purpose specified.

5. In an automatic brake applying device, the combination with the train valve, car axle, scale bar, threaded spindle, the nut meshing with the spindle, and the stop on the bar, of a worm on the axle, a vertical shaft, a worm wheel thereon meshing with the worm on the axle, bevel gears connecting the vertical shaft with the threaded shaft and means for reversing the drive to compensate for the change in direction of the train as and for the purpose specified.

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