No. 791,398. PATENTED MAY 30, 1905.

E. T. ATWELL.

SIGNAL.

APPLICATION FILED FEB. 17, 1905.

3 SHEETS—SHEET 1.

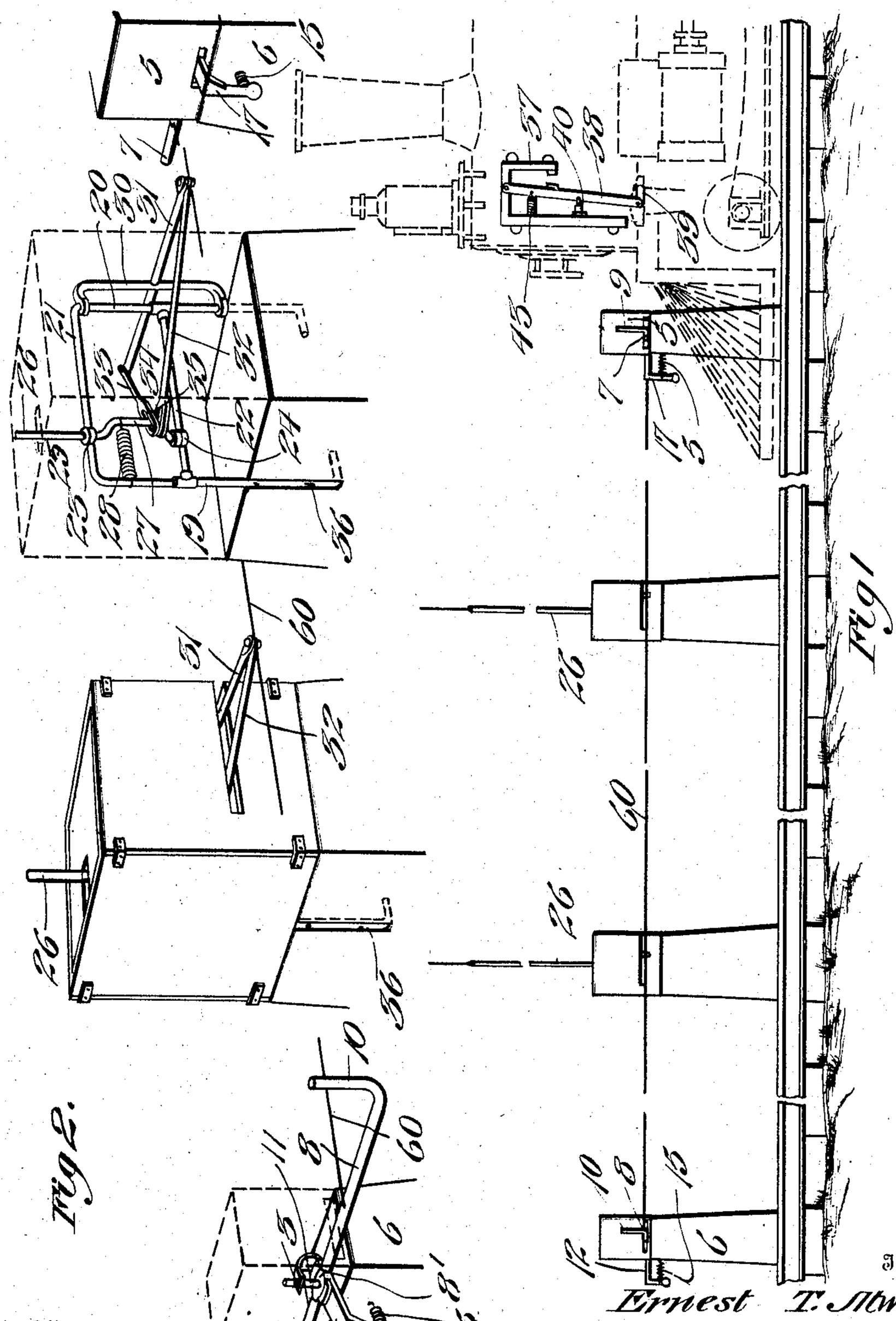

Fig. 1.

Fig. 2.

Witnesses

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3 SHEETS—SHEET 2.

Fig 3.

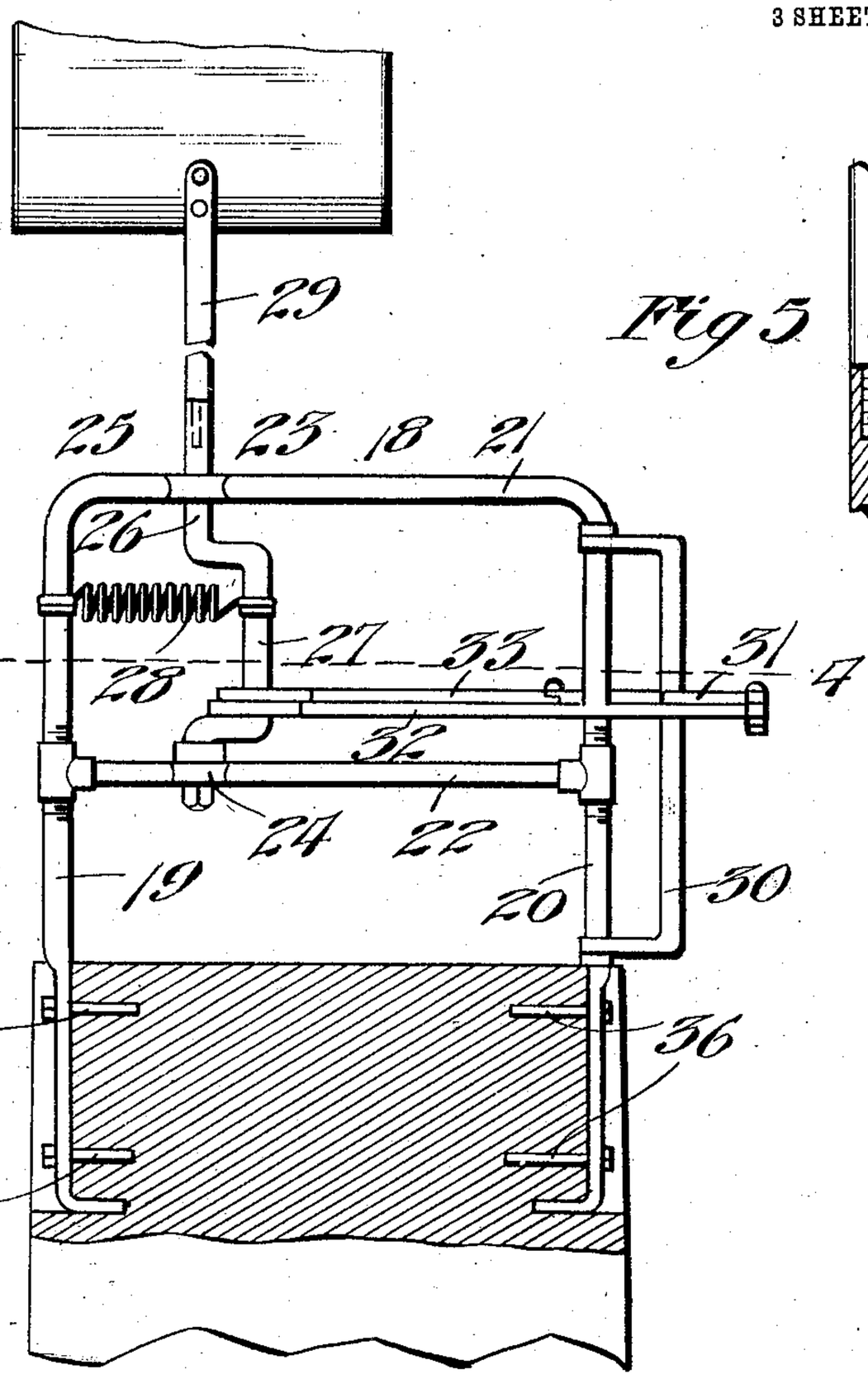


Fig 5.

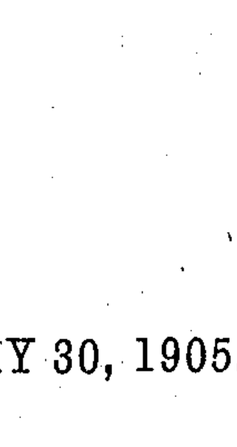
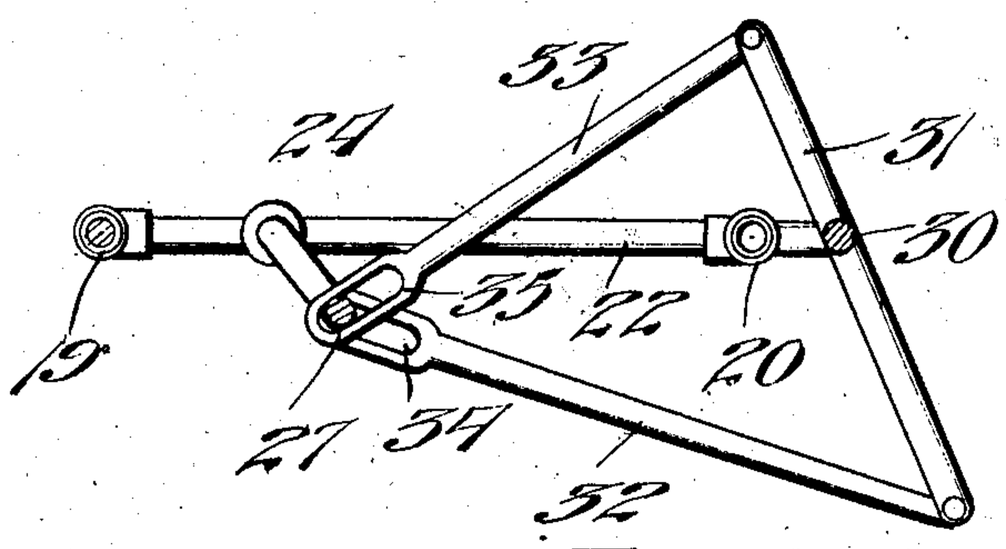


Fig 4.



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3 SHEETS—SHEET 3.

Fig 6.

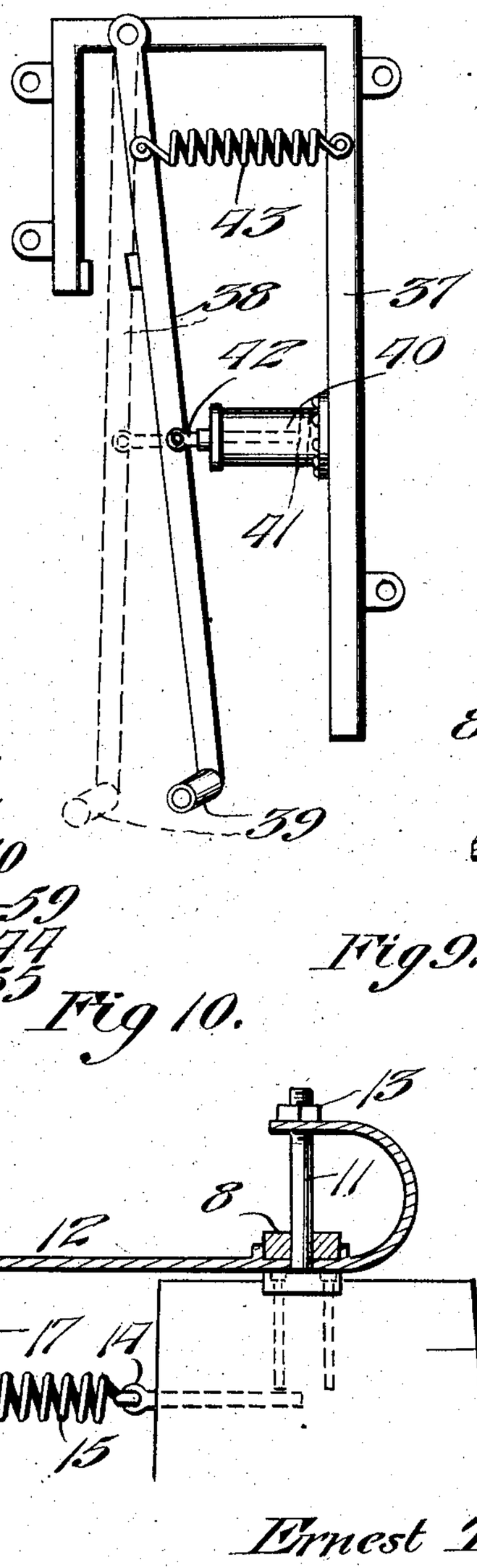

Fig 7.

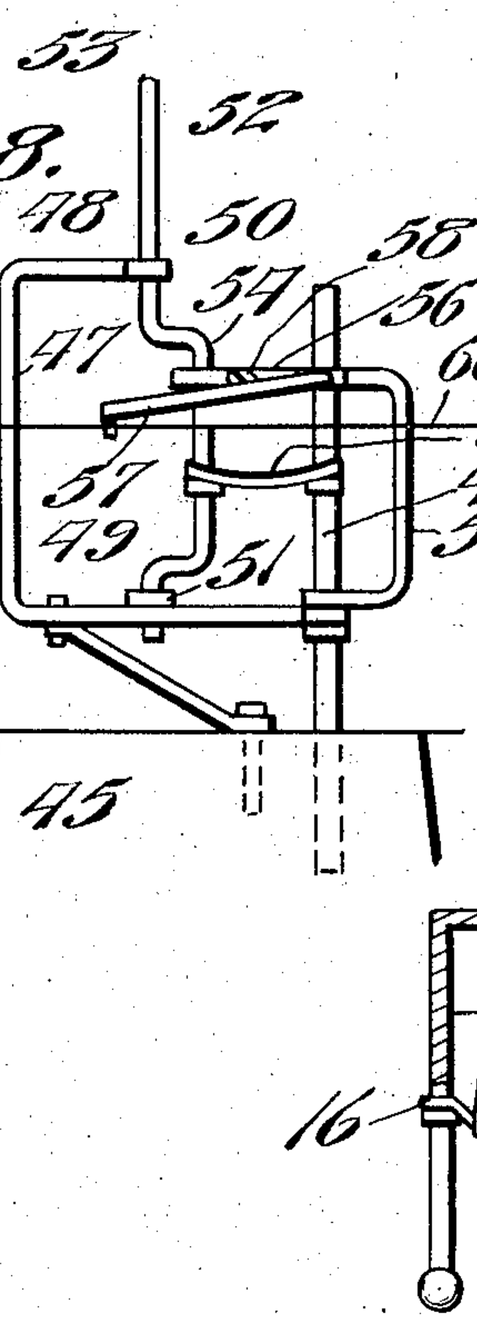

Fig 8.

Fig 9.

Fig 10.

Witnesses

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UNITED STATES PATENT OFFICE.

ERNEST TAYLOR ATWELL, OF WAUKOMIS, OKLAHOMA TERRITORY.

SIGNAL.

SPECIFICATION forming part of Letters Patent No. 791,398, dated May 30, 1905.

Application filed February 17, 1905. Serial No. 246,152.

To all whom it may concern:

Be it known that I, ERNEST TAYLOR ATWELL, a citizen of the United States, residing at Waukomis, in the county of Garfield, Oklahoma Territory, have invented new and useful Improvements in Signals, of which the following is a specification.

My invention relates to automatic danger-signals for use upon railroads, and has for its object the provision of a block-signaling system or a system of signals adapted to herald the approach of a train to a crossing and actuated by a single wire.

A further object of the invention is the provision of means whereby the signaling devices may be actuated by a moving train without jar or shock and automatically locked in the position to which they are thrown.

Further objects and advantages of the invention will be set forth in the detailed description which now follows.

In the accompanying drawings, Figure 1 is a diagrammatic view of the devices comprising the signaling system. Fig. 2 is a perspective view of said devices with certain of the parts broken away, omitted, or shown in dotted lines. Fig. 3 is a side elevation of the semaphore-actuating devices with its supporting-post partially in section. Fig. 4 is a horizontal section upon line 4 4 of Fig. 3. Fig. 5 is a side elevation of the semaphore-stem, showing the standard into which it is threaded in section. Fig. 6 is a side elevation of the contact device carried by the train. Fig. 7 is a detail view of the lower end of said contact device, illustrating the manner in which it contacts with the arms controlling the semaphores. Fig. 8 illustrates a modified form of automatic locking device for the semaphores. Fig. 9 is a plan view of a spring used in said modified form of locking device with certain of the parts with which it coacts in section; and Fig. 10 is an elevation, partially in section, of a tension device located at each end of the system.

Like numerals designate similar parts in all of the figures of the drawings.

Referring to said drawings, the numeral 5 designates a supporting post or standard located at one end of the length of track the system is designed to guard, and 6 a similar post or standard located at the opposite end of said system. Mounted for oscillatory movement upon posts 5 and 6 are the arms 7 and 8, having upturned ends 9 and 10, adapted to be engaged by a contact device carried by the train and hereinafter more fully described. Arms 7 and 8 are pivoted to posts 5 and 6 in the manner illustrated in Fig. 10. Referring particularly to said figure, the numeral 11 designates a rod or shaft which passes through arm 8, which is enlarged, as at 8′, and through a second arm 12, having its inner end bent, as illustrated in said figure, said rod 11 passing through said bent-over end of arm 12 and having a nut 13 threaded upon its outer end. Secured to post 6 is an eyebolt 14, to which is attached one end of a coil-spring 15, the other end of said spring being attached at 16 to an extension 17 of arm 12 for a purpose hereinafter described.

As is best illustrated in Figs. 2 and 3, the semaphore-actuating mechanism proper comprises a frame 18, consisting of vertical standards 19 and 20 and horizontal braces 21 and 22. Mounted for oscillatory movement in bearings 23 and 24 of the horizontal members of the frame is a semaphore-standard 25, comprising a standard portion proper, 26, and an offset crank portion 27. One end of a coil-spring 28 is attached to crank 27, and the other end of said spring is attached to standard 19 of frame 18. For convenience in assembling the parts the signal-carrying part 29 of the semaphore-standard is made separate from the standard proper and is threaded therein, as is clearly illustrated in Fig. 5. Mounted for swinging movement upon standard 20 of frame 18 is a vertical bracket 30, carrying an arm 31, to the outer ends of which are pivoted levers 32 and 33, the inner ends of said levers being slotted, as at 34 and 35, and embracing crank 27 of the semaphore-standard. Screws 36 serve to fasten frame 18 to its supporting-post.

The contact device hereinbefore mentioned is best illustrated in Fig. 6 and comprises a supporting-bracket 37, a swinging arm 38, carrying a contact-knob 39, a dash-pot 40, carried by the supporting-bracket 37 and having

a piston 41 and piston-rod 42, the outer end of which is attached to arm 38, and a coil-spring 43, one end of said spring being secured to bracket 37 and the other end of said spring being secured to arm 38.

The modified form of semaphore-actuating devices illustrated in Figs. 8 and 9 may be substituted for the devices shown in Figs. 1 and 2, if desired, said modified devices comprising a standard 44, carried by a post 45, a frame 46, having a vertical portion 47, and horizontal portions 48 and 49. Mounted for semirotation in bearings 50 and 51 is a semaphore-standard 52, comprising a standard proper, 53, and a crank portion 54. Mounted for oscillatory movement upon standard 44 is a bracket 55, having its upper arm extended, as at 56, to embrace and actuate crank 54 of semaphore-standard 52. An actuating-arm 57, formed integral with arm 56 and braced with relation thereto, as at 58, has secured to its outer end the wire which actuates the semaphore. Secured to standard 44 is a strap or flat spring 59, (best illustrated in Fig. 9,) the free end of which engages the crank portion 54 of the semaphore-standard.

The operation of the device is as follows: When it is desired to use the signal devices in connection with a block system, the arrangement of elements is substantially such as is shown in Fig. 2. Post 5 and one of the semaphores are located at one end of the block, while post 6 and another semaphore are located at the opposite end of said block. One end of a wire or cable 60 is connected to arm 7, carried by post 5. Said wire is also connected to the outer ends of arms 31, and the other end of said wire is then connected to arm 8, carried by post 6. It is important to note that wire 60 is connected to arm 7 upon one side of its pivot, while it is connected to arm 8 upon the opposite side of its pivot. As the engine (illustrated in dotted lines in Fig. 1) carrying the contact device comes into position for knob 39 to strike the upturned end 9 of rod 7 said rod will be shifted to the left in Fig. 1, which will result in pulling wire 60 to the right. This will result in setting the signals to close the block to all other trains traveling in either direction. This is accomplished through the medium of the mechanism hereinbefore described and illustrated in Fig. 3. When wire 60 is pulled to the right, arm 31 and bracket 30 are rocked upon standard 20. This movement of arm 31 imparts such motion to levers 32 as will cause said levers to pull the crank portions of the semaphores to the position shown in Fig. 2, at which time the signals are set to close the block. When the train reaches the other end of the block, knob 39 contacts with the upturned end 10 of arm 8, which pulls wire 60 to the left and through levers 33 shifts the semaphores to a position at right angles to their former position to thereby open the block. By referring particularly to Fig. 7 it will be seen that knob 39 is set at such an angle to arm 38 that the jar resulting from contact with arms 9 and 10 will be greatly reduced. When in addition to this the spring 45 is provided to make arm 38 a yielding one and a dash-pot is provided to prevent the spring from returning said arm 38 with too great force, it will be seen that the jar or shock resulting from the contact will be inappreciable. As the crank 27 passes its center of movement spring 28 is distended, and after said center of movement has been passed said spring will act to automatically lock the semaphore-standard in either of its extreme positions. In the modification shown in Figs. 8 and 9 spring 59 serves to accomplish the same purpose—viz., locking the semaphore crank-arm in its extreme positions, as will be readily understood by referring to Fig. 9, in which the position of the parts when at one limit of movement is shown in full lines and the position at the other limit of movement is shown in dotted lines.

Arm 7 is exactly like arm 8 and carries the same kind of tension device. (See Fig. 1.) By virtue of this construction all slack of wire 60 or lost motion of the parts will be taken up, said tension devices working upon the same principle, as far as being locked in their extreme positions is concerned, as the semaphore-actuating devices—that is, when arm 12 and its extension 17 passes its center of movement spring 15 serves to lock it in its extreme position. This construction also provides means for compensating for expansion and contraction of wire 60.

From the foregoing description it will be seen that simple and efficient means for actuating a block system by means of a single wire are herein shown and described; but while the elements thereof are well adapted to perform the functions for which they are provided it is to be understood that changes may be made in the minor details thereof without departure from said invention.

It will be apparent that the usefulness of the device is not confined to block systems alone. It may be used to herald the approach of trains to crossings, or the wires 60 may be attached to bridges, whereby if such bridge should be swept away trains coming toward said bridge would be automatically signaled and stopped. If desired, the bearings for the semaphore-standard may be roller or ball bearings.

Having described my invention, what I claim is—

1. In a signaling system, the combination with a series of signal devices adapted to be actuated by a single wire, of means carried by a train for imparting movement to said wire and means for automatically locking said wire in each of its limits of movement.

2. In a signaling system, the combination with a series of signaling devices having mem-

bers controlling the movement of said devices, of a contact member for engaging said controlling members, carried by a train, said contact member comprising a swinging arm, a spring resisting the movement of said arm and a dash-pot resisting the movement of said spring.

3. A railway-signal comprising a semaphore, a crank upon said semaphore-shaft, means controlled by a single wire for actuating said semaphore in both directions and means for locking said semaphore in its extreme positions.

4. A railway-signal comprising a semaphore, a crank upon said semaphore-shaft, a rocking arm, levers carried by said rocking arm and engaging said crank and means for locking said semaphore in either of its extreme positions.

5. A railway-signal comprising a frame, a semaphore, a crank carried by the shaft of said semaphore, a rocking arm, levers pivoted to the ends of said rocking arm and engaging said crank, and a spring, one end of which is secured to the frame and the other end of which is secured to said crank.

6. A railway-signal system comprising a plurality of signal devices, tension devices, a wire or cable engaging all of said devices and a yielding arm carried by a train and adapted to impart movement to said wire.

7. A railway-signal system comprising a plurality of signal devices, tension devices comprising pivoted spring-controlled arms, located at each end of said system and a wire engaging said spring-controlled arms upon opposite sides of their pivots, substantially as described.

8. In a railway-signal system, the combination with semaphores, comprising a signal, a shaft, a crank upon said shaft, a rocking arm, levers pivoted to the ends of said arm and controlling said shaft, means for locking said semaphores in their extreme positions, a wire engaging said rocking levers, and tension devices comprising pivoted, spring-controlled arms to which the ends of said wire are secured, said wire being secured to one of said arms upon one side of its pivot and the other end of said wire being secured to the other of said arms upon the opposite side of its pivot.

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

ERNEST TAYLOR ATWELL.

Witnesses:
C. MORRIS,
J. L. REGER.