May 7, 1929. M. FANDERS 1,712,339

AUTOMATIC WHISTLE

Filed Jan. 3, 1928 2 Sheets-Sheet 1

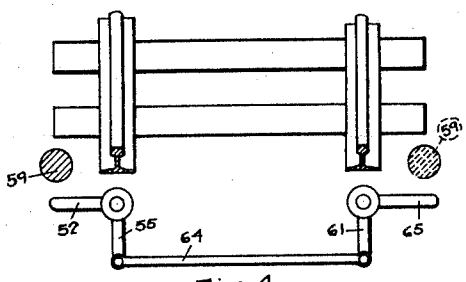


Fig. 4

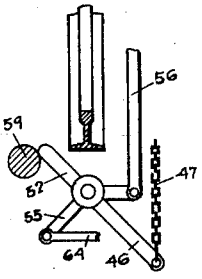


Fig 1.

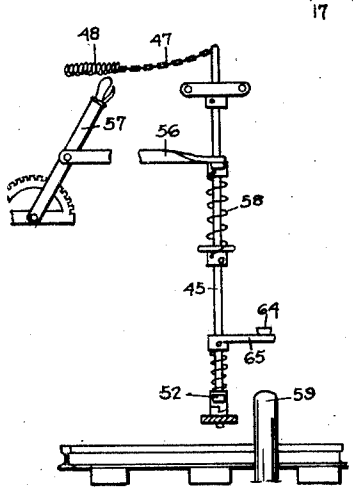


Fig. 2

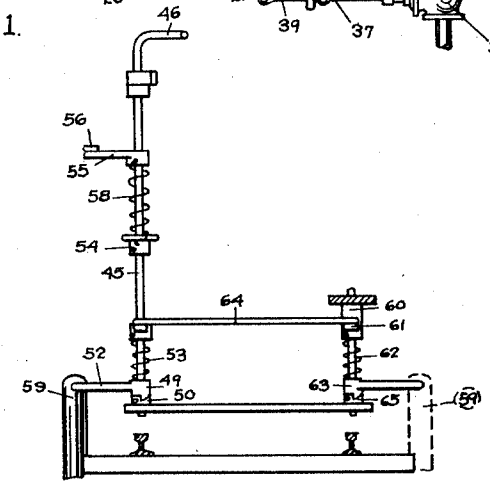


Fig. 3

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AUTOMATIC WHISTLE

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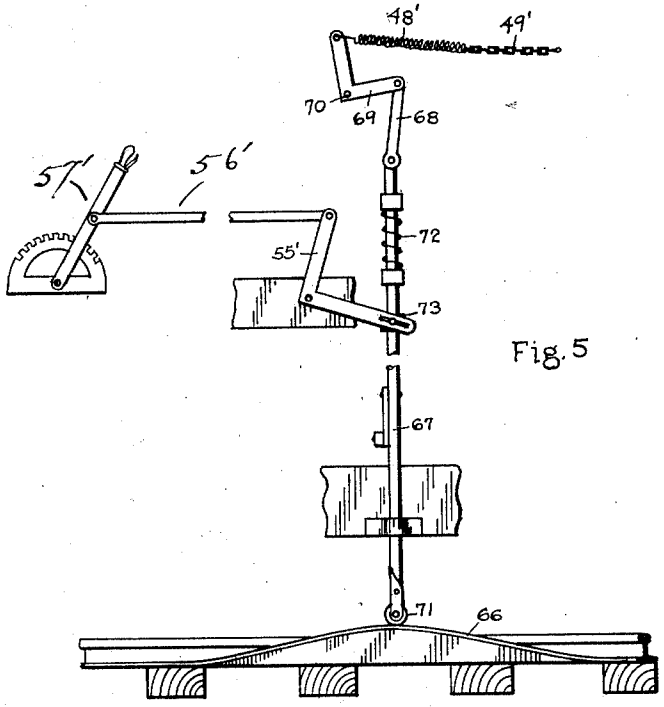


Fig. 5

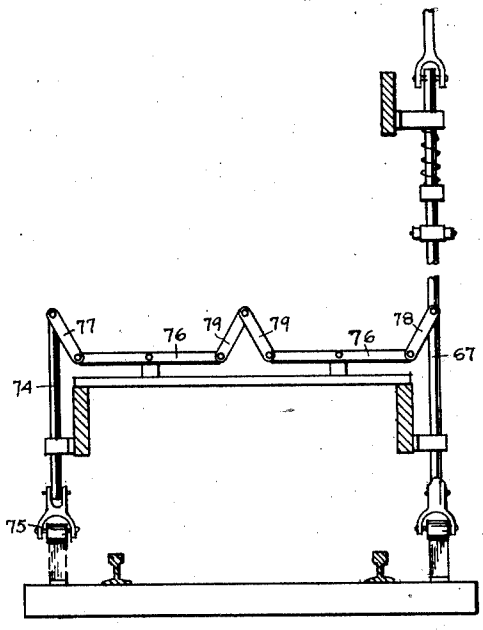


Fig. 6

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UNITED STATES PATENT OFFICE.

MARTEN FANDERS, OF BEATRICE, NEBRASKA, ASSIGNOR OF ONE-THIRD TO MARTIN BEGUS, OF BEATRICE, NEBRASKA.

AUTOMATIC WHISTLE.

Application filed January 3, 1928. Serial No. 244,358.

My invention relates to automatic whistles and its primary object is the provision of a whistle actuating mechanism which may be applied to a locomotive to be operated automatically to thus relieve the engineer of the necessity of watching for the whistle posts so that he can direct his attention to other and more important matters.

Another object of my invention is the provision of adjusting mechanisms whereby any desired combination of blasts may be obtained from the whistle, whereby adjustment may be made in the number and duration of the blasts and of the interval between successive blasts.

Another object of my invention is the provision of actuating mechanism whereby the whistle will be actuated only during the forward movement of the locomotive.

Another object of my invention is the provision of buffer springs which take up the shock of the impact when a rapidly moving locomotive strikes a fixed trip.

Having in view these objects and others which will be pointed out in the following description, I will now refer to the drawings, in which

Figure 1 is a view in elevation showing the whistle actuating mechanism.

Figure 2 is a view in elevation of the shaft 45 and of its connections and showing particularly the relation between the trip arm 52 and the fixed abutment.

Figure 3 is a view in elevation showing the parts which are shown in Figure 2 as viewed when looking forwardly.

Figure 4 is a plan view of the parts shown in Figures 2 and 3.

Figures 5 and 6 are elevational views showing a modified form of abutment and showing also modified forms of a trip mechanism.

Numeral 10 designates a cylinder having end walls 11 and 12. The cylinder is provided with a piston 13 having a piston rod 14 projecting through the wall 11. The end wall 11 is provided with extensions having collars 15 and 16 for slidably receiving rods 17 and 18 respectively, the rods being maintained in parallel relation with respect to the axis of the cylinder 10. The rods 17 and 18 are connected at their rear extremities by a connecting member 19 which is secured to the piston 14 at its projecting extremity. The arrangement is such that movement of the piston rod 13 is communicated to the rods 17 and 18 which travel in the same direction as the piston. The mode of operation of course, is to introduce steam into the cylinder head so as to move the piston toward the end 11 under the pressure of the steam. The rod 17 is surrounded by a coil spring 20 which has its abutments on the disc 21 and on the collar 15. The same spring 20 functions to brake the movement of the piston 13 and to thus retard that movement and it serves also to restore the piston to its inoperative position when the pressure of the steam is released from the cylinder.

The end portions 11 and 12 of the cylinder are provided with upward extensions 22 and 23 and these upward extensions are connected at their upper ends by means of a bar 24. Above the bar 24 and parallel therewith is a bar 25 which is connected by means of a coil spring 26 and a chain 27 to the valve of the whistle 28. The bars 24 and 25 are both apertured along their lengths. Connecting the bars 24 and 25 are levers 29 which are also apertured in order to permit adjustment of the levers 29 relative to the bars. The rod 18 is provided at its free extremity with a pivoted lever trip 30 connected with a coil spring 31. It will be apparent that the movement of the piston 13 under the pressure of the steam will result in the sliding movement of the rod 18 together with the trip 30. The trip 30 engages the lower extremities of the levers 29 and causes pivotal movement of these levers about their pivots on the bar 24. The result is that the upper extremities of the levers 29 are moved to carry with them the bar 25 to tension the spring 26 and to thus actuate the whistle. The movement of the trip 30 is thus communicated to the levers 29 and as soon as the trip 30 has passed any particular lever 29, the lever is restored under the action of the spring 26 to its normal inoperative position.

The feature of adjustment between the levers 29 and the bars 24 and 25 is necessary in order to vary the time between and the length of the blasts. The interval may be varied by varying the distance between successive levers 29 and the lengths may be varied by vertically adjusting the levers

29 on the bars 24 and 25. It will be obvious that if the levers 29 project downwardly to increased distances, the trip 30 will be in longer engagement with the levers 29 to thus prolong the time during which the whistle valve is open. By the adjusting means thus described it is possible to provide for any desirable combination of blasts both in lengths and intervals, the number of blasts being determined by the number of levers 29 in use. Thus if two shorts and a long are desired then the first two levers to be engaged by the trip levers are to be connected to the bars 24 and 25 with their lower extremities on a higher level than that of the third lever 29.

The device may be operated by any compressible gas but since it is to be used mainly on locomotives, it should be connected with a source of steam, either dry or lubricated. If dry steam is used, then lubricating oil should be introduced to lubricate the piston 13. The steam is introduced through a pipe 32 having a connection 33 with the cylinder 13. The pipe 32 is provided with gate valves at 34 and 35, the valve 34 being the inlet valve and the valve 35 being the exhaust valve. The valve stem 36 of the valve 34 is extended a considerable distance and the valve stem 37 of the valve 35 is somewhat extended. The valve stems 36 and 37 are provided with links 38 and 39, the free ends of the links being connected by means of a lever 40 which is pivotally connected at 41 at a fixed point between the valve stems 36 and 37. The movement of either valve stem is thus communicated in the opposite direction to the other valve stem so that when one of the two gate valves is open, the other is closed. The pipe 32 is further provided with a needle valve 42 for regulating the rate at which steam may be introduced into the cylinder 10. The valve stem 37 is further provided with a linkage having a dead center spring 43 for positively forcing the valve 35 to open or closed position when the parts move across center.

After the last blast of the whistle the trigger 30 will strike the lower end of the lever 44 which is pivotally connected to the bar 24 and to the rod 36. The movement of the upper end of the lever 44 causes a movement of the rod 36 to close the valve 34, and the movement of rod 36 to close the valve 34 automatically opens the valve 35 by means of the mechanism just described. No more steam is thereafter admitted to the cylinder 10 but the steam within the cylinder is allowed to escape through the valve 35. Under the action of the spring 20, the piston 13 is restored to its normal inoperative position and the steam within the cylinder 10 is forced out. During this movement of the piston 13 the rod 18 is restored to its former position and the trip 30 slides over the lower ends of the levers 29, the spring 31 permitting the passage of the trip lever 30 over the ends of the levers 29.

From the foregoing description it will be obvious that when tension is applied momentarily to the rod 36, the remainder of the operation will be entirely automatic for giving the desired number of blasts of the whistle of the desired durations of the blasts and intervals between the blasts, and for then automatically restoring all of the parts to their normal inoperative position. In Figure 1, I have shown one form of device which may be employed for giving the initial impulse to the rod 36 and in the other figures I have shown various optional forms of devices for accomplishing the same result.

The shaft 45 is journalled in fixed position relative to the frame of the locomotive. At its upper extremity it is provided with a lever arm 46 which is connected through a chain 47 and a spring 48 with the end of the rod 36. The turning of the shaft 45 will be communicated directly to the rod 36 and the sudden movement of the rod 45 will be cushioned by means of the spring 48. At the lower end of and loosely surrounding the shaft 45 is a ratchet collar 49 cooperating with the ratchet collar 50 secured to the shaft 45. Projecting from the ratchet collar 49 is a lever arm 52 which is adapted to come in contact with any desired fixed abutment along the railroad track either between the rails or on the outer side thereof. In the forward motion of the locomotive, the lever arm 52 will be swung around through an arc, the arcuate movement being communicated through the ratchets 49 and 50 to the shaft 45 when the locomotive is in forward motion. The ratchet mechanism permits the free swinging of the lever arm 52 when the locomotive is traveling rearwardly but it actuates the shaft 45 positively when the locomotive moves forwardly.

It is frequently desirable as when using the locomotive for switching purposes that the automatic device for actuating the whistle be thrown out of operation and for this reason I have provided a mechanism as shown for example in Figure 1. The shaft 45 is provided with a fixed collar 54 surrounding the shaft and with a lever 55 which is journalled on the shaft. The outer end of the lever 55 is connected by means of a link 56 to an adjusting lever 57 of any desired form which is secured to a fixed part of the locomotive frame. Surrounding the shaft 45 between the collar 54 and the lever 55 is a coil spring 58 having its ends anchored in the collar and the lever respectively. The movement of the lever will then turn the shaft 45 through an arc such that the lever arm 52 will pass the abutments without touching them.

It is my purpose to do away entirely with the whistling posts now in common use and I substitute therefor abutments of any desired form such as those indicated by the numeral 59 in Figure 2. These are, of course, always placed on the right-hand side of the track depending on the direction of movement of the locomotive. This necessitates that the actuating shaft 45 be also placed on the right-hand side of the locomotive. It frequently happens, however, that a locomotive is compelled to travel rearwardly long distances and in such cases the tripping lever 52 is on the side opposite the tripping abutments 59. For this reason I provide a mechanism whereby the shaft 45 will be actuated from either side of the locomotive. This also may be varied between wide limits and I have shown only a few of the optional forms. In the form shown in Figure 3, a short shaft 60 is journalled in the frame of the locomotive on its left side and this shaft is provided with a lever arm 61, a spring 62 and a ratchet device 63 similar to those on the shaft 45. The lever arms 45 and 61 are connected at their outer ends by means of a link 64. When, therefore, the locomotive is moving backwardly the lever arm 65 engages the abutment 59 and the motion is communicated through the link 64 to the shaft 45.

The mechanism shown in Figures 2, 3 and 4 permits actuation of the shaft 45 from either side of the track. When the locomotive is moving forwardly and the trip arm 52 engages an abutment 59, the movement of the trip arm 52 is communicated to the shaft 45. If the locomotive is then backed up and passes the abutment 59, the trip arm 52 will be swung through an arc as it passes the abutment 59 but the arcuate movement will not be communicated to the shaft 45. As the locomotive moves forwardly the trip arm 65 will engage all of the abutments on the left-hand side of the track but they will be merely swung through an arc as they pass these abutments, the ratchets permitting movement of the trip arm without movement of the shaft 60. In backing up, however, the trip arms 65 engage the abutments on the left-hand side of the track in such a manner that the arcuate movements of the trip arms are communicated to the shaft 60 and through the link 64 to the shaft 45 to set in operation the automatic whistling device.

The abutment 59 is admirably adapted for the function of setting in operation the trip mechanism through the shaft 45. Its chief drawback is in the fact that a rapidly moving locomotive generates an impact which may be only partly taken up in the springs. For this reason I provide an alternative abutment of the form shown at 66 in Figures 5 and 6. The abutment in this case is preferably secured to the rails or to another fixed part of the track and it is provided with an upper convex surface of gradual slope. It is manifest that with this abutment the shaft 45 will not function. The rod 67 is secured to the frame of the locomotive in a manner such that it can slide up and down. At its upper end it is connected to a link 68 which in turn is connected to an L-shaped lever 69 which is secured to a fixed pivot 70. The lever is connected through a spring 48′ and a chain 49′ to rod 36 in such a manner that the upward movement of the member 67 causes tension in a horizontal direction on the rod 36. Secured to the lower end of the member 67 is a roller or other antifriction member 71 which travels over the curved surface of the member 66. Surrounding the member 67 is a coil spring 72 which is so arranged that it normally maintains the member 67 in its lower position and so that it restores that member to its lower position after the roller 71 has passed over the surface of the member 66.

The mechanism shown in Figure 5 may also be thrown into its inoperative position. For this purpose I provide a lever 57′ with link 56′ and bell crank 55′ for raising the member 67 against the tension of the spring 72. The bell crank 55′ is provided with a slot for receiving a pin passing into the slidable collar 73 surrounding the member 67.

The device shown in Figure 5 may also be operated from either side of the track by employing the mechanism shown in Figure 6. The slidable member 74 is secured to the frame of the locomotive on the left-hand side and it is provided with a roller 75 at its lower end for engaging the abutments on its side of the locomotive. Two horizontal spaced levers 76 are pivotally secured intermediate their ends to the frame of the locomotive. One of these levers is connected through a link 77 to the slidable member 74 while the other lever is connected through a link 78 to the slidable member 67. At their inner ends the levers 76 are connected to each other by means of a V-shaped pair of pivotally connected links 79.

From the foregoing description it will be apparent that when the trip member strikes a whistling abutment, on the right-hand side if the locomotive is moving forwardly or on the left-hand side if the locomotive is moving rearwardly, tension will be applied to the rod 36 to open the valve 34 and to simultaneously close the valve 35. The steam will then enter the cylinder 10, the rate of flow of the steam being governed by the needle valve 42. The piston 13 will then move rearwardly carrying with it the frame members 17 and 18, the movement of the piston 13 being somewhat retarded by the spring 20. The tension of the spring 20

may be adjusted so as to produce the proper intervals between blasts of the whistle. As the frame member 18 moves rearwardly under the impulse of the piston rod 14, the trip member engages the lower extremities of the levers 29 in succession. The number and positions of levers 29 determine the number of blasts of the whistle, the lengths of the blasts and the intervals between successive blasts. After the trip member 30 has passed the last of the levers 29 it engages the lower extremity of the lever 44 to move the piston rod 36 in a direction to close the valve 34 and to simultaneously open the valve 35. The spring 20 then ceases to function as a brake spring and it assumes the function of restoring the piston 13 to its normal inoperative position and to force the steam out of the cylinder 10 through the valve 35. When once the trip member engages a whistling abutment, the remainder of the operation is entirely automatic.

The whistling abutments are necessarily placed on both sides of the railroad track but only those on the right-hand side when the locomotive is moving forwardly and only those on the left-hand side when the locomotive is moving rearwardly will actuate the whistling mechanism. In the embodiment disclosed in Figure 1, the trip members will of course engage the whistling abutments whether the locomotive is moving forwardly or rearwardly but the ratchet devices prevent the actuation of the whistling mechanism except when the locomotive, in moving either forwardly or rearwardly, approaches a crossing or other place where the whistle must be actuated. The structure shown in Figures 5 and 6 permits of operation by all trackside trips. If it is desired to throw the whistling mechanism entirely out of operation, as when switching in the yards, it is only necessary to throw back the lever 57 or its equivalent lever 57′ of Figure 5.

The springs 26, 48, 53 and 58 are of great importance in their connections. The effect of a rapidly moving locomotive is to produce a violent impact between the trip member and the whistling abutment. All of these springs serve largely as buffers to take up the shock. It will be noticed that if the arm 46 is violently thrown to its active position the tension on the rod 36 is applied through the spring 48 which takes up much of the motion. In other words, the spring 48 is expanded under the sudden action of the arm 46 and the spring is then more slowly contracted to actuate the piston rod 36. The same thing is true of the spring 26 so that the whistle valve is not opened too suddenly.

Having thus described my invention in such full, clear, and exact terms that its construction and operation will be readily understood by others skilled in the art to which it pertains, what I claim as new and desire to secure by Letters Patent of the United States is:

1. In an automatic locomotive whistle actuating mechanism, a cylinder and a piston, a pipe for conducting steam into said cylinder to move said piston rearwardly, an inlet valve and an outlet valve in said pipe, a plurality of levers, a trip member movable with said piston and adapted to engage said levers in succession, a tension member connected with the valve of the locomotive whistle and connected with all of said levers whereby the whistle valve will be opened on engagement of said trip member with one of said levers, a spring for retarding the rearward movement of said piston and for returning said piston to its normal inoperative position, and connections between said inlet and outlet valves whereby the opening of the inlet valve causes the closing of the outlet valve.

2. In an automatic locomotive whistle actuating mechanism, a cylinder and a piston, a pipe for conducting steam into said cylinder to move said piston, a valve in said pipe, a fixed member having a plurality of levers secured thereto and depending therefrom, a trip member movable with said piston and adapted to engage said levers in succession, and a tension member connected with the valve of the locomotive whistle and connected with all of said levers whereby the whistle valve will be opened on engagement of said trip member with one of said levers, said levers being adjustable on said fixed member to vary the distance between successive levers to thereby vary the intervals between successive blasts of the whistle.

3. In an automatic locomotive whistle actuating mechanism, a cylinder and a piston, a pipe for conducting steam into said cylinder to move said piston, a valve in said pipe, a fixed member having a plurality of levers pivotally secured thereto, a trip member movable with said piston and adapted to engage said levers in succession and a tension member connected with the valve of a locomotive whistle and connected with all of said levers whereby the whistle valve will be opened on engagement of said trip member with said levers, said levers being vertically adjustable on said fixed members to vary the lengths of the blasts of the whistle.

4. In an automatic locomotive whistle actuating mechanism, a cylinder and a piston, a pipe for conducting steam into said cylinder to move said piston, a valve in said pipe, a plurality of levers, a trip member movable with said piston and adapted to engage said levers in succession, a tension member connected with the valve of the locomotive whistle and connected with all of said levers whereby the whistle valve will be opened on

engagement of said trip member with one of said levers, said valve being provided with an elongated valve stem, and a trip lever connected to said valve stem and having its free end portion in the path of said trip member whereby engagement of said trip member with said trip lever results in the closing of said valve.

5. In an automatic locomotive whistle actuating mechanism, a cylinder and a piston, a pipe for conducting steam into said cylinder to move said piston, a valve in said pipe, a fixed member having a plurality of levers pivotally secured thereto, a trip member movable with said piston and adapted to engage said levers in succession, a tension member connected with the valve of the locomotive whistle and pivotally connected with all of said levers whereby the whistle valve will be opened on engagement of said trip member with said levers, a valve stem for said valve, a trip lever pivotally connected to said valve stem and to said fixed member and having its free extremity in the path of said trip member whereby the engagement of said trip member with said trip lever will cause the closing of said valve, and spring means for restoring said piston to its normal inoperative position after the closing of said valve.

In testimony whereof I affix my signature.

MARTEN FANDERS.