No. 675,223. Patented May 28, 1901.

J. A. KIMBER.

CONTROLLING AND OPERATING MEANS FOR WATER SCOOPS FOR LOCOMOTIVES.

(Application filed Oct. 30, 1900.)

(No Model.)

2 Sheets—Sheet 1

Fig. 1.

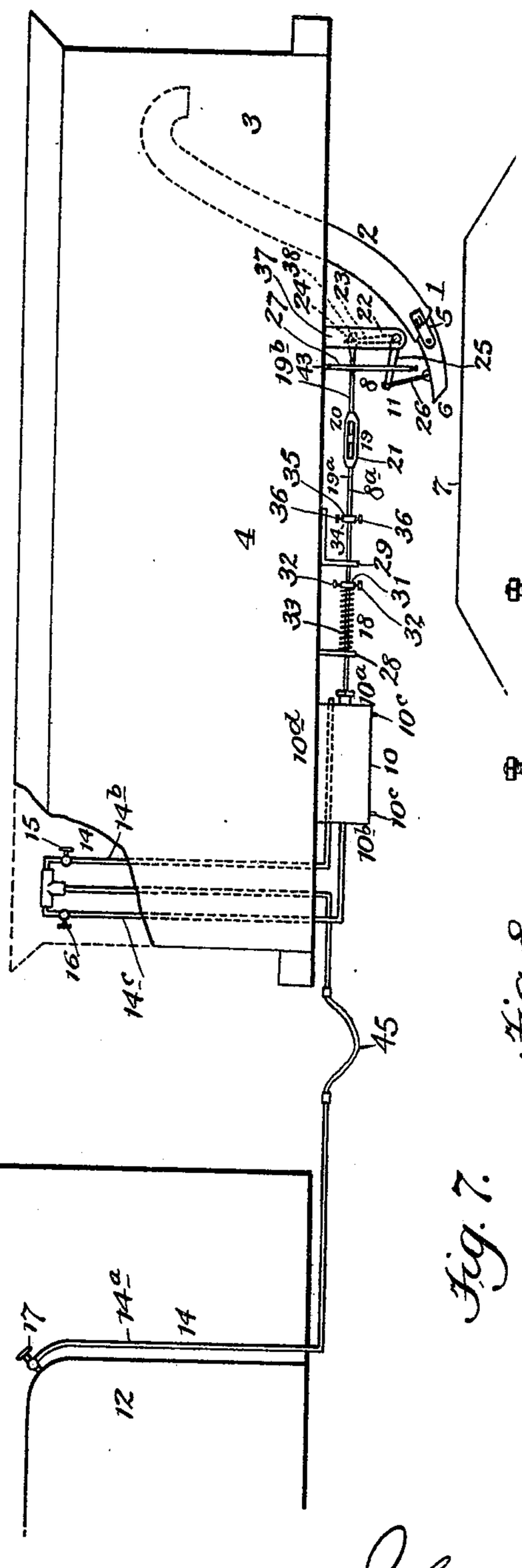


Fig. 4.

Fig. 5.

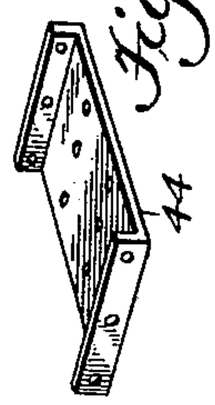


Fig. 6.

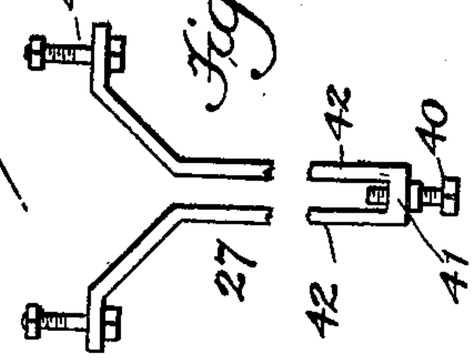
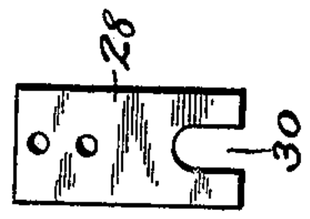


Fig. 8.

Fig. 7.



Witnesses

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CONTROLLING AND OPERATING MEANS FOR WATER SCOOPS FOR LOCOMOTIVES.

(Application filed Oct. 30, 1900.)

(No Model.) 2 Sheets—Sheet 2.

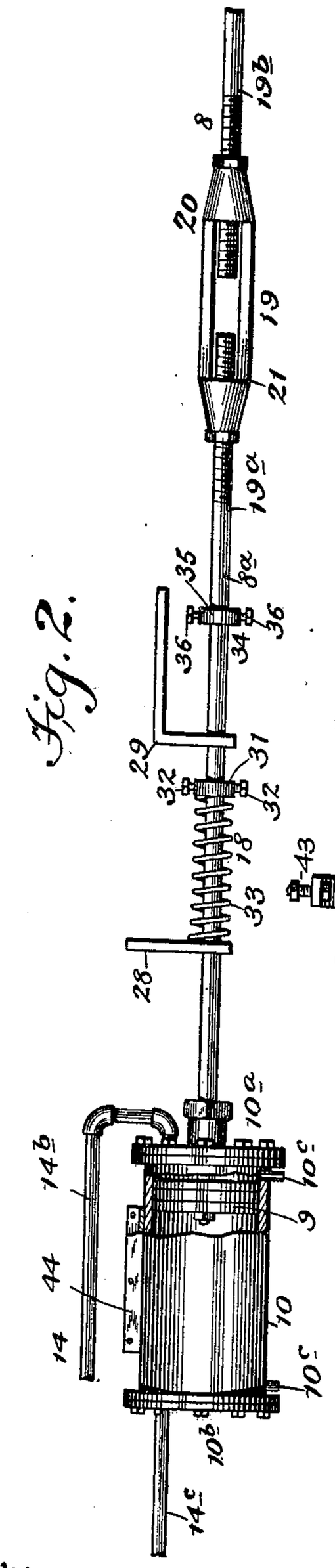

Fig. 2.

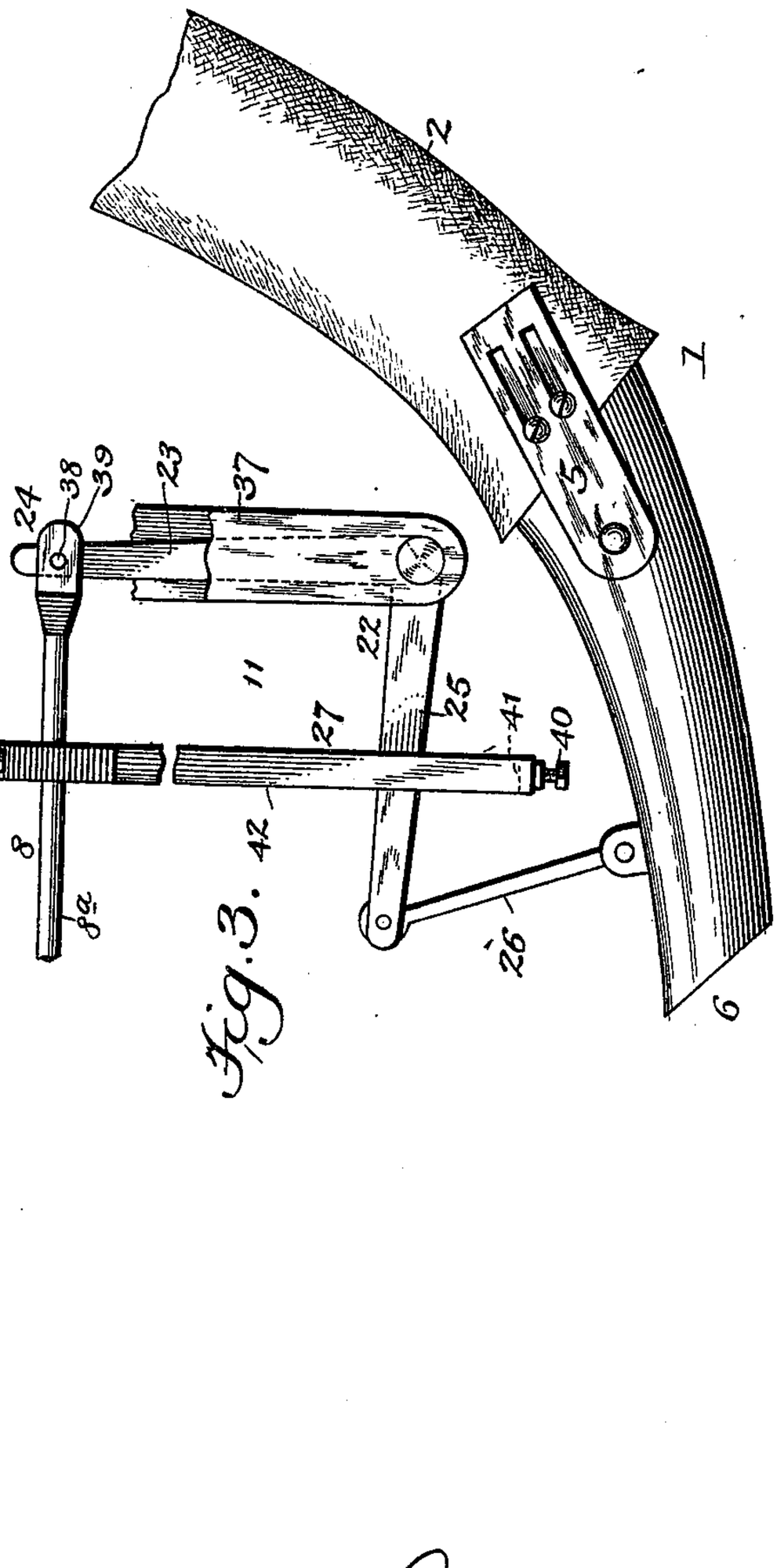

Fig. 3.

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UNITED STATES PATENT OFFICE.

JOHN A. KIMBER, OF RENSSELAER, NEW YORK.

CONTROLLING AND OPERATING MEANS FOR WATER-SCOOPS FOR LOCOMOTIVES.

SPECIFICATION forming part of Letters Patent No. 675,223, dated May 28, 1901.

Application filed October 30, 1900. Serial No. 34,874. (No model.)

To all whom it may concern:

Be it known that I, JOHN A. KIMBER, a citizen of the United States, residing at Rensselaer, in the county of Rensselaer and State of New York, have invented certain new and useful Improvements in Controlling and Operating Means for Water-Scoops for Locomotives, of which the following is a specification.

This invention relates to controlling and operating means for water-scoops for locomotives; and it has for its object to provide improved means of this class which will be superior in point of positiveness of action, convenience, accuracy, and safety in operation.

According to the present invention the water-scoop is preferably actuated by steam or compressed-air power drawn from the locomotive-boiler or air-compressor, and the application of power to throw the water-scoop into or out of operative position is controlled by suitable valves arranged for convenient operation by the engine-crew. The manual manipulation of the water-scoop is thus obviated. My improved controlling means also embodies devices for accurately regulating the movement of the water-scoop and preventing its injurious engagement with the water-trough or road-bed.

In the drawings, Figure 1 is a side elevation of a portion of a locomotive and tender, illustrating my improved controlling means in operative position, several of the parts being broken away to illustrate the interior construction. Fig. 2 is a detail perspective view of a portion of the construction illustrated in Fig. 1, several of the parts being broken away to illustrate interior construction. Fig. 3 is a detail side elevation of another portion of the construction illustrated in Fig. 1. Fig. 4 is a detail plan view of an element of the construction illustrated in Fig. 3. Fig. 5 is a detail perspective view of a part of the construction illustrated in Fig. 2. Fig. 6 is a detail front view of a part of the construction illustrated in Fig. 2, partly broken away. Fig. 7 is a detail front view of a further part of the construction illustrated in Fig. 2. Fig. 8 is a detail front view of a still further part of the construction illustrated in Fig. 2.

Corresponding parts in all the figures are denoted by the same reference characters.

Referring to the drawings, 1 designates the water-scoop, which is connected with the lower end of the tank-supply pipe 2, by which it communicates with the water-tank 3, which is, as usual, comprised in the construction of the tender 4. The water-scoop 1 is pivoted to or flexibly connected with the supply-pipe 2, as at 5, in the customary manner and is free to move in a vertical path, whereby its mouth or intake portion 6 may project into or be withdrawn from the track-trough, a portion of which, as at 7, is illustrated in Fig. 1.

In my invention the scoop 1 is controlled by means of an operating element 8, preferably carried beneath the tender. The operating element 8 preferably consists of a piston-rod 8^a, actuated by a piston 9, which operates within a cylinder 10, carried at any convenient point, preferably beneath the tender, as at 10^d. The piston-rod 8^a is operatively connected at its outer end with the water-scoop, preferably by means of leverage devices 11. The cylinder 10 is connected with a source of power, preferably the boiler 12 of the locomotive 13, by steam-supply pipes 14, provided with controlling-valves 15 and 16, whereby steam may be admitted to the respective ends of the cylinder, and a main controlling-valve 17, whereby steam may be passed from the boiler to the valves 15 and 16.

18 designates tensional means which operate upon the operating element 8 to normally maintain the water-scoop in raised or inoperative position.

The operating element 8 or piston-rod 8^a is preferably bisected, as at 19, and the bisections 19^a and 19^b are connected by an adjusting device 20, preferably consisting of a turnbuckle 21, having an operative threaded connection with the bisections.

The leverage devices 11 preferably embody a bell-crank lever 22, one arm of which, 23, is pivotally connected, as at 24, with the piston 8^a and the other arm 25 of which is connected with the water-scoop 1 by a link 26.

27 designates stop means for limiting the play of the leverage devices 11, and consequently limiting the vertical movement of the water-scoop 1 and determining its degree of operative projection.

To accommodate the tensional means 18, I preferably provide spaced brackets 28 and 29, which depend from the under side of the tank

3 or tender 4 and are cut out at their lower edge portions, as at 30, to receive the piston-rod 8^a. A collar 31 is loosely mounted upon the piston-rod between the brackets and is provided with set-screws 32, whereby it may be secured in adjusted position. The tensional means 18 preferably consist of a coiled spring 33, mounted upon the piston-rod between the bracket 28, which is nearest the cylinder 10, and the collar 31 and bears operatively upon said bracket and said collar. The spring 33 exerts a constant tendency which normally maintains the operating element in the position of operative projection, which through the agency of the leverage devices 11 maintains the water-scoop 1 in raised or inoperative position. When the operating element is moved into operatively-retracted position, the leverage devices 11 are operated to depress the water-scoop 1.

The collar 31 may readily be adjusted along the piston-rod to regulate the potential of the spring 33 with relation to the tension required to maintain the scoop in normal elevated position.

34 designates an adjustable stop device which preferably operates in connection with the brackets 29 and serves to limit the operative retraction of the operating element. The stop device 34 preferably consists of a collar 35, loosely mounted upon the piston-rod and provided with set-screws 36, whereby the collar may be locked to the piston-rod in adjusted position. The collars 31 and 35 are, as illustrated, preferably arranged upon the piston-rod at opposite sides of the bracket 29.

The bell-crank lever 22 is preferably supported by a depending bracket 37, connected with the lower portion of the tender 4 or tank 3. The arm 23 of the bell-crank lever is preferably connected with the piston-rod by a pivot-pin 38, which is seated in spaced cheeks 39, formed at the outer end of the piston-rod.

The means 27 for limiting the play of the leverage devices 11 preferably consist of an adjusting-screw 40, which operates with respect to the arm 25 of the bell-crank lever 22 and is mounted in a cross-head 41, which connects the lower ends of two bracket-arms 42, secured beneath the tender 4 or tank 3, as at 43, and which project at either side of the arm 25 of the bell-crank lever. The cross-head 41 is thus arranged in the path of play of the arm 25 and beneath the same. The adjusting means 27 regulates the downward play of the arm 25, and consequently of the water-scoop 1.

The steam-supply pipes 14 comprise a main pipe 14^a, extending to the valves 15 and 16, and branch pipes 14^b and 14^c, extending, respectively, from the valves 15 and 16 to the opposite ends of the cylinder 10, as at 10^a and 10^b, respectively. When steam is admitted to the cylinder 10 at the end 10^a of the same, the operating element 8 or piston-rod 8^a is retracted against the resistance of the tensional means 18 and the leverage devices 11 are operated to depress the water-scoop 1. When steam is admitted to the cylinder 10 at the end 10^b of the same, the operating element 8 and water-scoop are returned to normal position. The cylinder is preferably provided at each end with an exhaust-port 10^c to permit of escape of exhaust-steam.

The cylinder 10 may be secured to the tender 4 or tank 3 at the under side of the same by means of a flanged connection-plate 44. (Illustrated in detail in Fig. 5.)

The main steam-supply pipe 14^a preferably embodies a flexible section or hose-coupling 45 between the locomotive and the tender, which may be of the slip-joint car-heating pipe-connection type and is capable of withstanding the necessary steam-pressure.

The operation and advantages of my improved controlling means for water-scoops will be readily understood by those skilled in the art to which it appertains.

The operating element 8 normally maintains the water-scoop in raised or inoperative position under actuation of the tensional means 18, the potential of which may readily be varied as required by the weight of the water-scoop. The adjusting device 20 is operated when it is desired to vary the normal vertical position of the intake end portion 6 of the water-scoop 1. It will be noted that the tensional means 18 normally maintains the water-scoop in the uppermost position allowed by the operating element 8 and that this position may be varied by operating the adjusting means 20 to lengthen or shorten the total length of the operating element. The downward play of the water-scoop 1 is limited by the adjustable stop means 27 and may be regulated to a nicety by adjusting the screw 40. It is manifest that the accurate limitation of the downward play or operative depression of the water-scoop is of importance, it being necessary to immerse the intake end portion 6 of the water-scoop in the trough 7 to a predetermined degree to insure speedy filling of the tank 3 and prevent injurious engagement of the water-scoop with the trough construction or road-bed.

The operating element 8 is in operation under control of the locomotive-crew, and in the use of the preferred form of actuating means for the operating element, as illustrated, consisting of the steam-fed cylinder 10, the main controlling-valve 17 is preferably arranged within the cab, as illustrated, in convenient position for control by the engineer, and the supplemental controlling-valves 15 and 16 are preferably arranged at the forward portion of the tender, as illustrated, in convenient position for control by the fireman. When the engineer desires to drop the water-scoop into operative position, he turns the valve 17 and admits steam to the supply-pipe 14^a. He then signals to the fireman to drop the water-scoop, which operation is accomplished by turning the valve 15 and admitting steam into the end portion 10^a of the cylinder behind the

piston 9, which latter is at once driven to the opposite end 10^b of the cylinder and causes the retraction of the piston-rod 8^a against the resistance of the spring 33, which operation depresses the water-scoop through the agency of the leverage devices 11. The valve 15 is then closed, cutting off steam from the cylinder, and the water-scoop is maintained in position by the impact of the water in the trough upon the water-scoop. When the tank 3 is sufficiently filled, the fireman turns the valve 16 and admits steam to the end portion 10^b of the cylinder behind the piston, and the piston executes the return stroke to its normal position, causing the piston-rod to raise the water-scoop through the agency of the leverage devices 11 and the tensional means 18. The ports 10^c in the cylinder at its opposite ends allow the exhaust-steam to escape from the cylinder, and thus prevent the formation of ice in the cylinder in cold weather. The ports 10^c also permit a gradual exhaust of the steam-cushions formed behind the piston during the actuation of the same.

The adjustable stop device 34 upon the piston-rod may, if desired, be employed solely to limit the play of the operating element, and consequently of the water-scoop, but preferably coöperates with the means 27 in its similar function.

I do not desire to be understood as limiting myself to the details of construction and arrangement as herein described and indicated, as it is manifest that variations and modifications may be made in the features of construction and arrangement in the adaptation of the device to various conditions of use without departing from the spirit and scope of my invention and improvements. I therefore reserve the right to all such variation and modification as properly fall within the scope of my invention and terms of the following claims.

Having thus described my invention, I claim and desire to secure by Letters Patent—

1. The combination, with a depressible water-scoop for locomotives, of an operating element for the water-scoop, connection devices between the water-scoop and the operating element, said connection devices embodying a bell-crank lever, and means for limiting the depression of said water-scoop comprising a bracket consisting of two arms between which one of the arms of said bell-crank lever operates, and an adjusting-screw carried by said bracket within the path of play of said lever-arm.

2. The combination, with a depressible water-scoop for locomotives, of an operating element for the water-scoop embodying a reciprocating rod, connection devices between the reciprocating rod and the water-scoop, adjustable stop devices carried by the reciprocating rod, devices with which said stop devices coact, to limit the play of said reciprocating rod, and tensional means operating with respect to one of said stop devices whereby said water-scoop is normally maintained in elevated position.

In testimony whereof I have signed my name in the presence of the subscribing witnesses.

JOHN A. KIMBER.

Witnesses:
E. J. GUILFOIL,
R. G. STEWART.