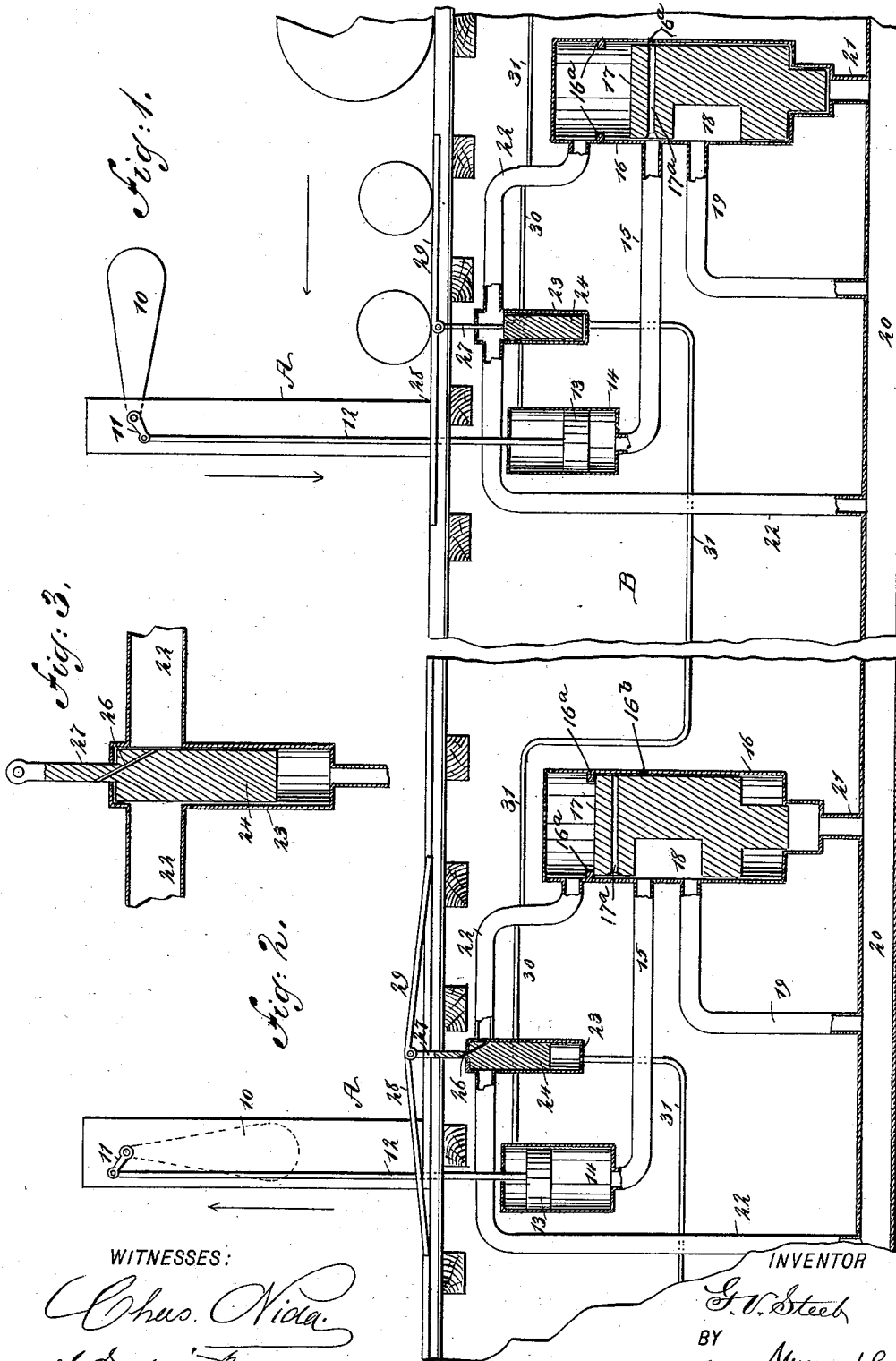


(No Model.)

G. V. STEEB.
PNEUMATIC SIGNAL.

No. 508,252.

Patented Nov. 7, 1893.



WITNESSES:

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PNEUMATIC SIGNAL.

SPECIFICATION forming part of Letters Patent No. 508,252, dated November 7, 1893.

Application filed May 19, 1893. Serial No. 474,793. (No model.)

To all whom it may concern:

Be it known that I, GEORGE VELTEN STEEB, of Brooklyn, in the county of Kings and State of New York, have invented a new and Improved Device for Operating Signals, of which the following is a full, clear, and exact description.

This invention relates to an improvement in devices especially adapted for operating semaphore signals, and it may likewise be utilized for operating alarm bells along a line of railroad; crossing-gates, and similar objects.

The object of the invention is to utilize air pressure for operating signals or semaphores, for example, and providing a means for bringing the air pressure into action through the medium of the train passing over the track.

The invention consists in the novel construction and combination of the several parts, as will be hereinafter fully set forth and pointed out in the claims.

Reference is to be had to the accompanying drawings forming a part of this specification, in which similar figures and letters of reference indicate corresponding parts in all the views.

Figure 1 is a vertical sectional view of the operating device, illustrating said device in position for setting a signal. Fig. 2 is a similar view of the device, illustrating it in the position it occupies when the signal is concealed; and Fig. 3 is a detail sectional view of the cut-off piston.

In carrying out the invention, if the device is adapted for operating a signal, the signal A may be of any approved construction, but preferably the semaphore arm 10, is connected by a link 11 with a rod 12, the downward movement of the rod serving to bring the semaphore into view, while the upward movement of the rod causes the semaphore to be concealed.

The operating device or mechanism of the signal is located adjacent thereto, and in a suitable chamber or cavity B, located adjacent to the track, preferably beneath the ground, ordinarily beneath one of the rails of the track. The operating rod 12 of the signal is provided at its lower end with a piston 13, and this piston works in a cylinder 14, which constitutes a portion of the operating mechanism. The cylinder 14 at its bottom,

is connected by means of a pipe 15 with a second and preferably lower cylinder 16, the cylinder 16 being of greater diameter than the cylinder 14.

Within the cylinder 16 a piston 17, has sliding movement, and the said piston is provided in one side with a pocket 18, and in the path of the said pocket a pipe 19, is connected with the cylinder 16, which pipe 19 is connected directly with the main air supply pipe 20. This latter pipe may be carried from any source of air supply, and it will be understood that the air contained in the supply pipe 20, will be under more or less of a pressure.

The cylinder 14 may be termed the setting cylinder, while the cylinder 16 may be properly termed the operating cylinder, as the cylinder 14 serves primarily to set the signal, while the cylinder 16, acts directly to supply air to the setting cylinder 14. The operating cylinder 16, is connected at its lower end by a branch pipe 21 with the main air supply pipe 20, as shown in both Figs. 1 and 2. Another pipe 22, which is connected with the air supply pipe 20, is carried upward preferably over the setting cylinder and connected with the operating cylinder near the upper end thereof, but in any event above the piston 17 in the operating cylinder.

A third or cut off cylinder 23, is located between the setting and operating cylinders. This cylinder is in direct communication with the upper section of the branch pipe 22 of the main air supply pipe. Within the cylinder 23, a cut-off valve 24, is located, and this valve as shown in Fig. 3, is provided with a channel 26, which extends diagonally through it in an upwardly direction, and likewise in the same direction through a stem 27, connected with the valve. The valve stem 27, projects through a suitable packing in the upper section of the branch air pipe 22, and is carried upward at one side of the rail of the track; and to the upper end of the valve stem 27, two arms 28 and 29, are pivotally connected, which arms, when the valve stem is in its upper position, as shown in Fig. 2, extend downward from the valve stem in opposite directions at the side of the track, forming two inclined planes, and these inclined planes are adapted to be engaged by the flange of a wheel of the locomotive, or by any

projecting arm or equivalent device connected with the locomotive, or with the car of a train; or the inclined planes may be engaged by any object forced downward upon them from the cab of the engine.

The construction of the operative mechanism is completed by connecting the upper portion of the setting cylinder 14 with the branch air pipe 22, above its point of connection with the operating cylinder by means of an exhaust pipe 30; and a second exhaust pipe 31, connects the branch air supply pipe 22 near its point of connection with the exhaust pipe 30, with the bottom of the cut-off cylinder 23 of the rear signal setting mechanism, as shown in Figs. 1 and 2, which figures represent one operating mechanism in advance of the other.

In the operation of the device the signal is normally concealed, as shown in Fig. 2, in which event the piston in the setting cylinder is in an upper position; the cut-off valve closes connection between the operating cylinder and the main air supply pipe, the channel 26, serving as a vent and to relieve the top of the piston in the operating cylinder from air pressure, and the piston in the operating cylinder is held in an upper position by the air pressure direct from the main air supply pipe 20, through the branch pipe 21 being prevented from rising above that position by stops 16^a and the compressed air passing from the pocket 18 through the pipe 15 enters the bottom portion of the setting cylinder. When a train passes the track and acts to set a signal, the inclined planes 28 and 29, are pressed downward, as shown in Fig. 1; therefore, the cut-off valve is forced downward within its cylinder, and direct communication is established between the main air supply pipe 20 and the operating cylinder 16 above its piston and the piston will fall to the bottom of the operating cylinder and the supply of air is cut off from the bottom of the setting cylinder, whereupon, the air passing through the branch supply pipe 22, will also pass through the exhaust branch 30 into the setting cylinder over its piston, and will force the said piston downward, thereby setting the signal. At the same time the compressed air will enter the second exhaust pipe 31 emanating from the branch supply pipe 22, and the air in the said second exhaust pipe 31, will be conveyed to the bottom of the cut-off cylinder of the signal operating apparatus last passed by the train and will force the cut-off valve to its upper position, closing communication between the top of the operating cylinder of the rear device and the main air supply pipe, whereupon the air in the main air supply pipe will act upon the piston in the operating cylinder and will force it upward, the air in the operating cylinder having escaped through the vent in the cut-off valve, which when the valve is in its upper position is in communication with the outside atmosphere.

The piston in the operating cylinder, when

it is forced to its upper position brings its pocket 18 in communication with the supply pipes 19 and 15, and therefore air will be supplied from the main supply pipe 20 through said pipes 15 and 19 to the bottom of the setting cylinder, and the setting rod 12, will be forced upward and the signal lowered and concealed. When the cut-off valve is in its upper position the air entering its cylinder 23 at the bottom serves to maintain it in that position.

It may be here remarked that a relief or trip valve or similar device is preferably provided in connection with the pipe 15 to relieve pressure in the same when the piston 13 is discharging in the cylinder 14. This device may consist of a vent 17^a extending transversely through the piston 17, and adapted to align with the pipe 15 and an exhaust opening 16^b in the cylinder 16.

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

1. In a device for operating signals, alarm bells, crossing-gates, &c., the combination, with a supply pipe adapted to supply air under pressure, and an operating cylinder connected at both ends with the said supply pipe, of a setting device adapted to be operated by compressed air and a pipe leading therefrom, a branch pipe from the supply pipe extending adjacent to the pipe leading from the setting device, a piston adapted to move in the operating cylinder and establish or interrupt the communication between the said branch pipe and the pipe leading to the setting device, a cut-off device arranged in one of the pipes leading to the ends of the operating cylinder, and means for actuating the said device from the track, as and for the purpose set forth.

2. In a device for operating signals, alarm bells, crossing-gates, &c., the combination, with a supply pipe adapted to supply air under pressure, an operating cylinder connected at its lower end with the supply pipe and having a piston located therein provided with a pocket, and a branch supply pipe connecting the main air supply pipe with the operating cylinder opposite the pocket of its piston, of a setting rod, a setting cylinder into which the rod passes, the rod being provided at its lower end with a piston, a pipe connection between the bottom of the setting cylinder and the operating cylinder, being connected with the latter in the path of the pocket of its piston, an air supply pipe connecting with the main supply pipe and with the upper portion of the operating cylinder, a cut-off cylinder located between the ends of the branch supply pipe, and a cut-off valve located within the said cut-off cylinder, said valve being lowered by external pressure, as and for the purpose set forth.

3. In a device for operating signals, alarm bells, crossing-gates, &c., the combination, with an air supply pipe, an operating cylinder in direct communication at one of its ends with

the said main supply pipe, a piston contained within the operating cylinder and provided with a pocket, a branch pipe connecting the main supply pipe with the pocket of the operating piston, a setting cylinder, a piston contained therein, a setting rod connected with the piston, and a pipe connection between the lower portion of the setting cylinder and the operating cylinder in the path of the pocket of its piston, of a branch air supply pipe connecting the main supply pipe with the operating cylinder opposite one end of its piston, a cut-off cylinder located within the path of the branch supply pipe, a cut-off piston operating within the said cut-off cylinder and provided with an air vent capable of

communication with the external atmosphere when the cut-off piston is in one position; and means, substantially as described, for externally operating the cut-off piston in one direction, a connection between the upper portion of the setting cylinder and the supply pipe in which the cut-off piston is located, and an exhaust pipe emanating from the said branch supply pipe, adapted to be connected with the bottom portion of another cut-off cylinder located in another operating device, as set forth.

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Witnesses:

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