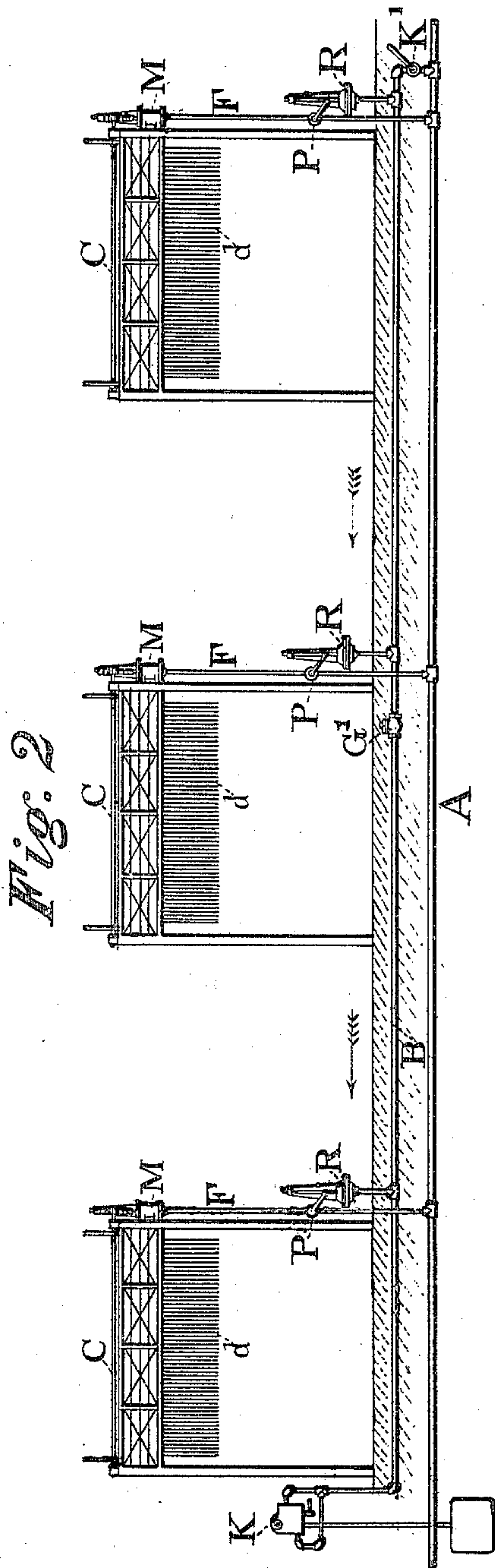
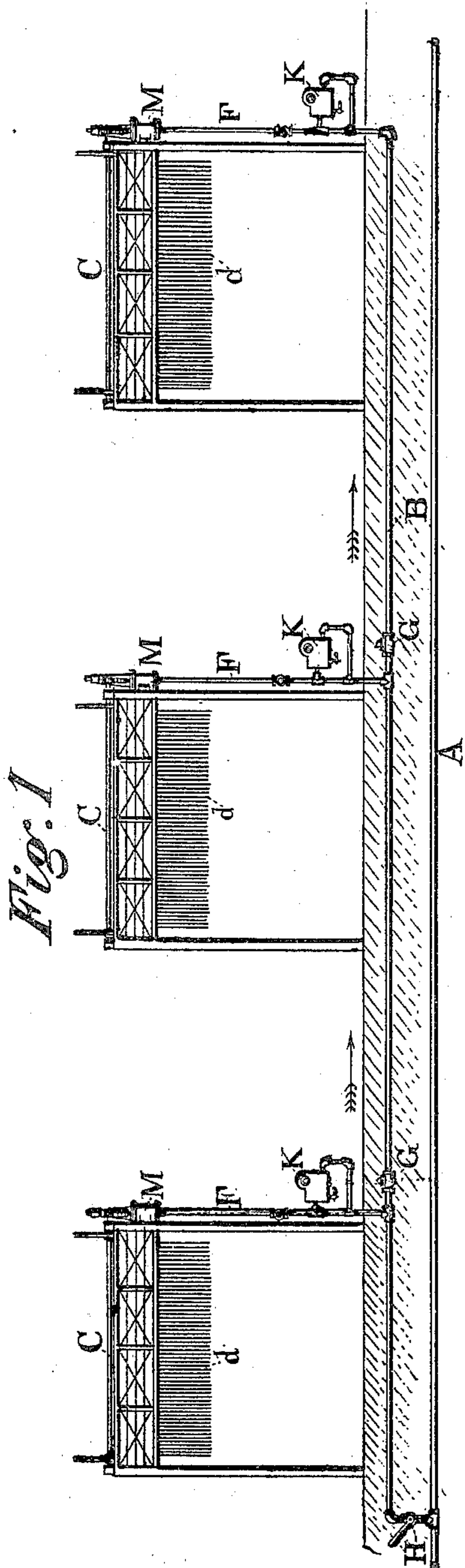


W. E. PRALL.

PNEUMATIC-SIGNALS FOR RAILWAY-CROSSINGS.

No. 172,491.

Patented Jan. 18, 1876.



Witnesses:

John E. Gurdig
L. E. Stockman

Inventor:

W. E. Prall

UNITED STATES PATENT OFFICE.

WILLIAM E. PRALL, OF WASHINGTON, D. C., ASSIGNOR TO PRALL RAILWAY
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IMPROVEMENT IN PNEUMATIC SIGNALS FOR RAILWAY-CROSSINGS.

Specification forming part of Letters Patent No. **172,491**, dated January 18, 1876; application filed
September 7, 1874.

CASE H.

To all whom it may concern:

Be it known that I, WILLIAM E. PRALL, of Washington city, in the District of Columbia, have invented an Improvement in Pneumatic Signals for Railway-Crossings, of which the following is a specification:

My invention relates to an improved apparatus for signaling, by means of compressed air, the approach of a train, simultaneously, at a number of crossings, either by sounding an alarm, displaying a simple cautionary signal, or closing a gate at each crossing of a street or road.

Figure 1 of the accompanying drawing illustrates the simplest form of my invention; and Fig. 2 illustrates a modification thereof.

A is a main pipe extending the entire distance of the section of road where the gates or signals are to be employed, and which is to be kept constantly charged with air under compression. B is a signal-pipe extending parallel to the main pipe and roadway, so far as it is desired, to effect a simultaneous display of signals, or closing of gates. C C are improved gates, consisting of a fringe of long cords, *d d*, depending from a movable bar suspended from pulleys operated by means of an air-piston and cylinder, M, so as to raise and lower the gate, all as is fully described in Letters Patent heretofore granted to me for the same. These gates are to be placed at the intersection of the railroad with the streets or roads in towns or cities, to close the way whenever a train is about to pass. The air-piston cylinders M M of the several gates are connected by branch pipes F F with the one signal-pipe B, so that whenever the compressed air is admitted to said pipe all of the gates will be simultaneously shut down by the movement of their said pistons. G G are simple check-valves placed in the signal-pipe in advance of each gate, so as to permit the air to pass freely through the pipe by and beyond each gate in the one direction, as indicated by the arrows; but to prevent a return or reflow of the air which has thus filled the several separate sections formed and separated by said valves. H is a cock or valve placed at the intersection

of the main and signal pipes to open and close the connection between the two. This cock may be operated automatically by a passing train, or otherwise by a switchman or other attendant upon the approach of the train. K K are automatic exhaust-valves or commutators, which may be constructed substantially as described in Letters Patent heretofore granted to me, and which, being operated by the passing train through the intervention of levers thereon, to be struck by an attachment in the locomotive or on one of the cars, will throw open an exhaust-vent, and allow the air in the piston-cylinder and pipe to exhaust and thus permit the gate to rise and open. In these commutators the pressure-piston, by which the exhaust-valve is automatically held open, may be supplied with air from the supply-pipe B, instead of from the air-main A. The check-valves G serve to prevent the exhaust of air from any one section through the exhaust-valve of the preceding section, when the latter is thrown open. Any desired number of gates may be closed simultaneously and be thereafter automatically opened, one at a time, as the train passes.

I contemplate the substitution of any suitable form or character of signal to be operated by means of compressed air delivered from the pipe B instead of the gates C, and the same may be displayed and withdrawn, or sounded and silenced, in the like manner.

In the series of gates or guard-signals arranged as illustrated in Fig. 2 of the drawings, air is admitted from the main pipe A to the signal-pipe B by means of a three-way exhaust-cock, K¹, to be operated by a switchman, who, so soon as the train has passed him, will, by closing the cock, open an exhaust for the signal-pipe, and thus re-open the gate or gates connected with the section nearest him, the length of this section being determined by the position of the check-valve G', which serves to prevent an escape of air through said exhaust from the portion of pipe beyond it. The section of pipe beyond the check-valve is in turn relieved from pressure, and the gates combined therewith are left free to open, by

the operation of an exhaust-commutator at the extreme end thereof to be actuated by the passing train.

In this arrangement of signals the pipes F, communicating with the air-pistons operating the gates or signals, are connected directly with the air-main A, instead of with the signal-pipe B; but these pipes are each controlled by a cock or valve, P, opened and closed by means of a second piston or diaphragm, R, operated by the admission and exhaust of air to and from the said signal-pipe B. The movement of these several secondary pistons or diaphragms R R may be so adjusted as that each in succession, from the first to the last, shall move more slowly than that preceding it, so that the instantaneous admission of air to the signal-pipe B shall, instead of produc-

ing a simultaneous movement of all the gates or signals, as first above described, cause them, by means of a suitable adjustment of the pistons, to move in succession one after the other in due order and proper time before the advancing train. Diaphragms may, in all cases, be substituted for pistons in the construction of the above-described apparatus.

I claim as my invention—

An air-signal pipe, B, provided with one or more automatic check-valves, G G', and combined with one or more exhaust-valves, K K', to operate successively, substantially as and for the purpose herein set forth.

W. E. PRALL.

Witnesses:

DAVID A. BURR,

WM. E. KNOWLES.