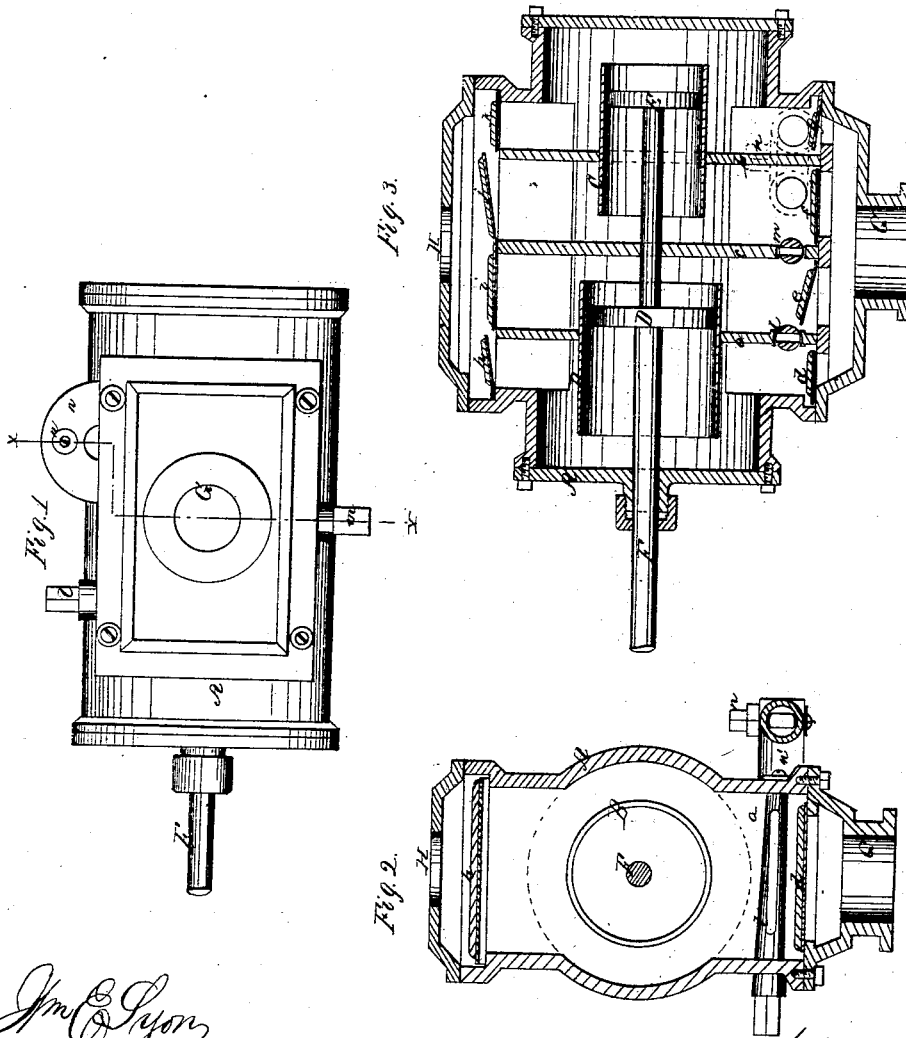


*J. N. Dennison*

*Double-Acting Pump,*

*Nº 54,247.*

*Patented Apr. 24, 1866.*



*Jm C Lyon*  
*Theo Fusch*

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# UNITED STATES PATENT OFFICE.

JOHN N. DENNISON, OF NEWARK, NEW JERSEY, ASSIGNOR TO HIMSELF,  
FRANCIS H. GOULD, AND ROSCOE J. GOULD, OF SAME PLACE.

## IMPROVEMENT IN FIRE-ENGINES AND PUMPS.

Specification forming part of Letters Patent No. 54,247, dated April 24, 1866.

*To all whom it may concern:*

Be it known that I, JOHN N. DENNISON, of Newark, in the county of Essex and State of New Jersey, have invented a new and useful Improvement in Fire-Engines and Pumps; and I do hereby declare that the following is a full, clear, and exact description thereof, which will enable others skilled in the art to make and use the same, reference being had to the accompanying drawings, forming part of this specification, in which—

Figure 1 represents an inverted plan of this invention. Fig. 2 is a transverse vertical section of the same, the line *xx*, Fig. 1, indicating the plane of section. Fig. 3 is a longitudinal central section of the same, taken in the plane indicated by the line *yy*, Fig. 1.

Similar letters of reference indicate like parts.

This invention relates to certain improvements on fire-engines of that class on which Letters Patent have been granted to me February 7, 1865, and the objects of these improvements is to give a greater variety of changes to the pump, so that the effective area of the pump can at all times be regulated to suit the circumstances under which the pump is to be used.

This invention consists in the arrangement of two or more pump-cylinders of different sizes, the pistons of which are connected to one and the same piston-rod, in combination with suitable cocks or valves, in such a manner that by adjusting said valves the amount of water thrown on each stroke of the pump can be made equal to the combined capacity of both cylinders, or each of the cylinders can be worked separately, and consequently three changes are possible, whereby the amount of water thrown can be readily adjusted to the distance of the pump from the fire or to the height to which the water is to be thrown.

A represents a chamber, in the interior of which are situated two cylinders, B C, of different diameters, the diameter of one being, for instance, five inches, and that of the other four or any other number of inches or feet desired. These two cylinders are open on both ends, and they are held in position by partitions *a b*, which extend clear across the chamber A, as shown in Fig. 3 of the drawings.

A partition, *c*, separates the two cylinders

one from the other, and the pistons D E of both cylinders are connected to one and the same rod, F.

The water enters the chamber A through the supply or suction pipe G, and it escapes therefrom through the discharge-pipe H, the communication between the suction-pipe and the interior of the chamber being opened and closed by valves *d e f g*, and that between the chamber and the discharge-pipe by valves *h i j k*. These openings, which are covered by these valves, are situated between the partitions *a b c*, and the valves *d e f g* open inward, whereas the valves *h i j k* open outward.

The several compartments of the chamber A can be made to communicate with each other by means of stop-cocks or valves *l m n*, which are fitted either in the partitions themselves or into a curved pipe, *n'*, which connects two of the compartments.

The operation is as follows: When the cocks *l m n* are all closed and the pistons in the cylinders B C move in the direction of the arrows marked near them in Fig. 3, the valves *e g* open to admit water to the chamber A, and at the same time the water before the pistons is forced out through the valves *i* and *h*, and the amount of water thrown is equal to the capacity of both cylinders.

If it is desired to throw off the small cylinder C the stop-cock *n* is opened. If the pistons are now moved in the direction of the arrows marked near them in Fig. 3, the water in front of the small piston is drawn through the pipe *n'* back, and the large piston alone operates. Consequently the quantity of water thrown by the pump on each stroke is reduced, as *s* to *q*, or, in other words, if the pump throws nine cubic feet of water with both cylinders working it will only throw five cubic feet when the large cylinder alone works.

If the stop-cock *n* is closed and the cock *l* opened, the small cylinder alone operates and the yield of water is reduced as four to nine. If the stop-cocks *l* and *n* are closed and the cock *m* is opened, the amount of water thrown by the pump is equal to the capacity of the large cylinder; and if the stop-cocks *l m n* are all opened the water thrown by the pump is reduced to nothing.

It will be noticed that the valve *m* in the central partition, *c*, can be dispensed with with-

out reducing the number of changes possible in my pump.

What I claim as new, and desire to secure by Letters Patent, is—

1. The arrangement of the cylinders B C, constructed as described, within the valve-chamber A, stop-cocks *l m n*, partition *c*, and pipe *n'*, operating in the manner and for the purpose herein specified.

2. The valves or stop-cocks *l n*, in combination with the pistons D E, chamber A, and partitions *a b*, constructed and operating substantially as and for the purpose set forth.

J. N. DENNISON.

Witnesses:

M. M. LIVINGSTON,

W. HAUFF.