

H. MATTHES.
Compressed-Air Engine.

No. 214,050.

Patented April 8, 1879.

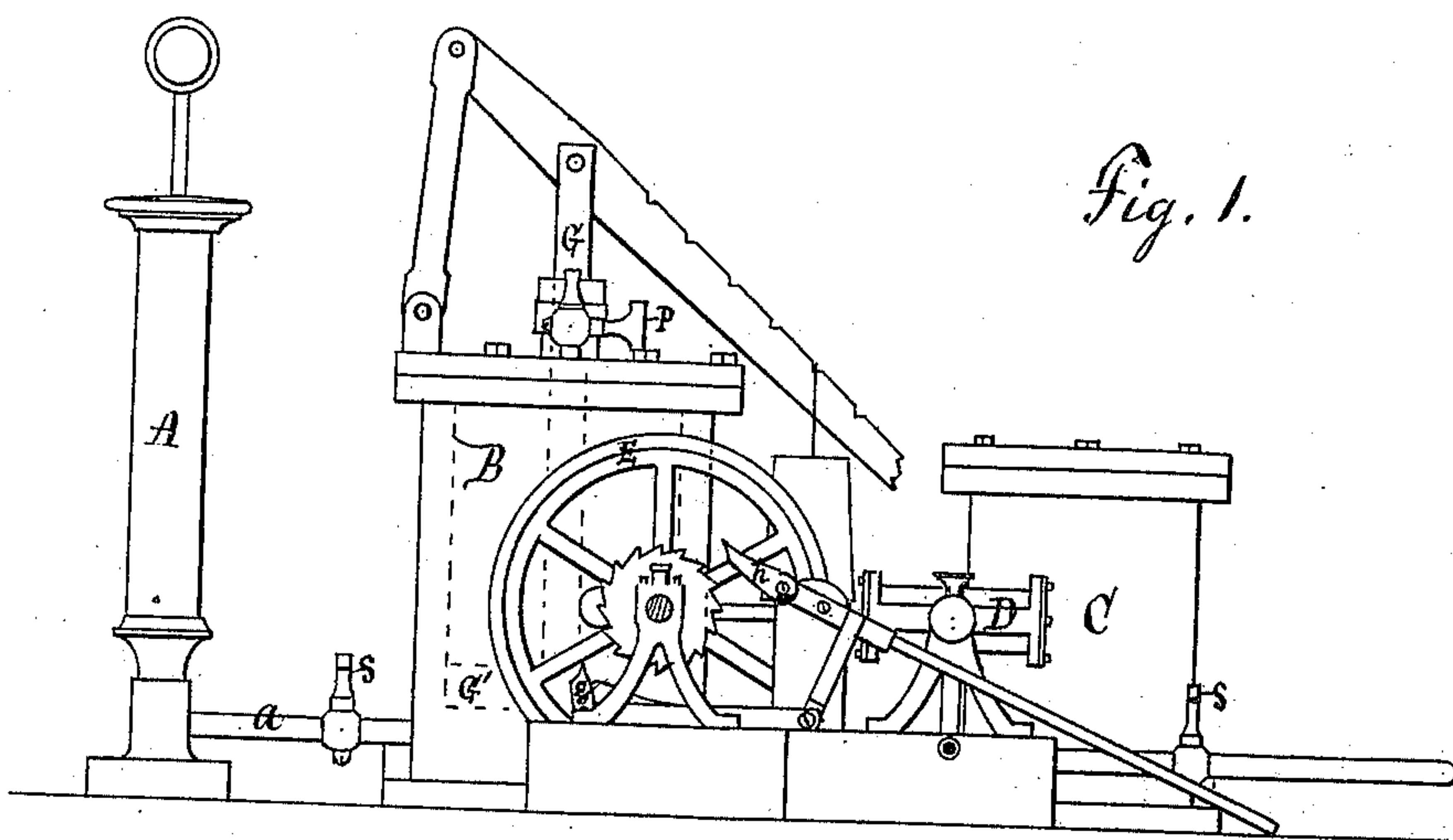


Fig. 1.

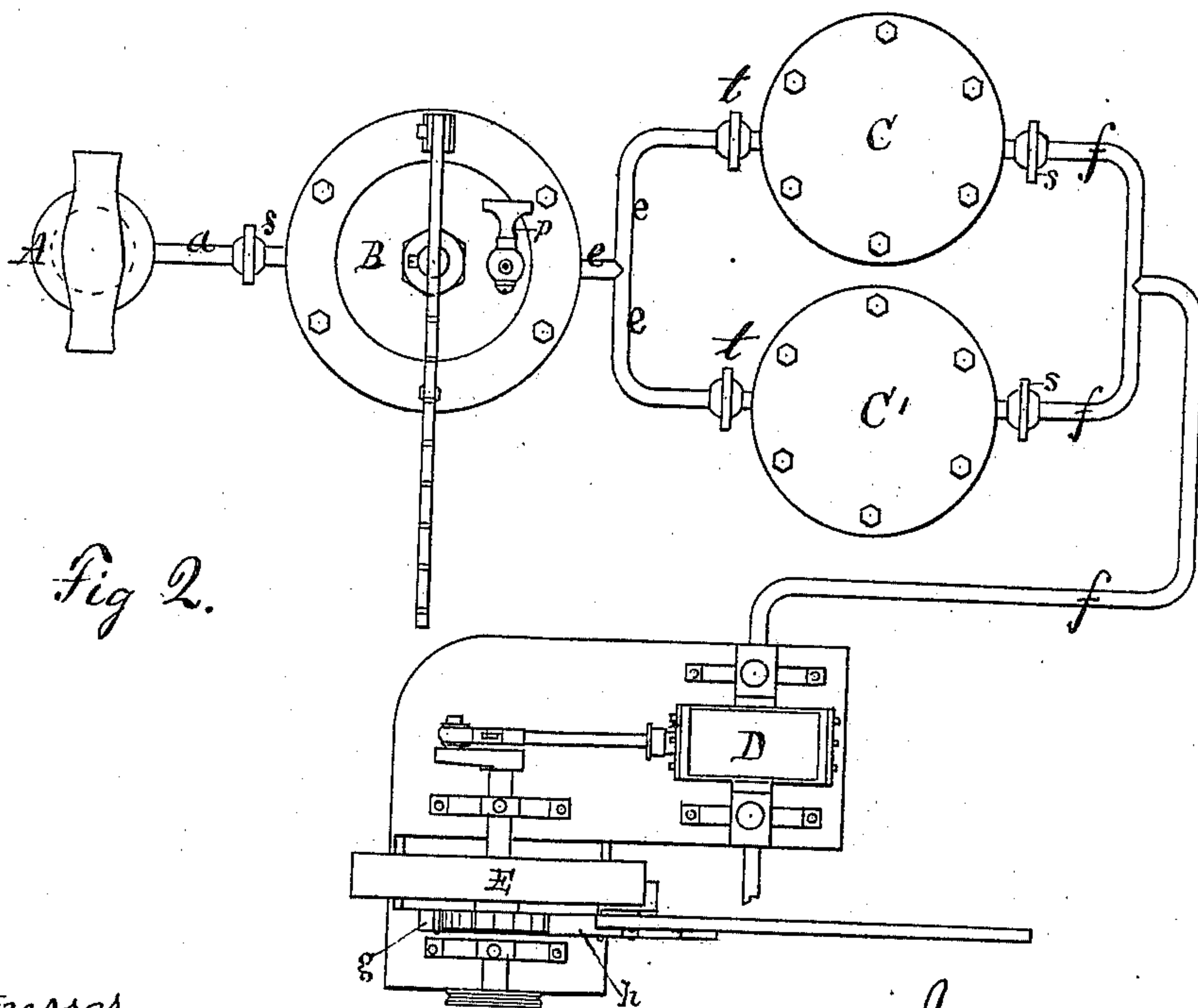


Fig 2.

Witnesses.
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UNITED STATES PATENT OFFICE.

HENRY MATTHES, OF CAMBRIDGE, MASSACHUSETTS, ASSIGNOR OF ONE-HALF HIS RIGHT TO BENJAMIN F. NOURSE, JR., OF SAME PLACE.

IMPROVEMENT IN COMPRESSED-AIR ENGINES.

Specification forming part of Letters Patent No. **214,050**, dated April 8, 1879; application filed October 30, 1878.

To all whom it may concern:

Be it known that I, HENRY MATTHES, of the city of Cambridge, in the county of Middlesex and State of Massachusetts, have invented certain new and useful Improvements in Combined Air Compressor and Reservoir, which improvements are fully set forth in the following specification, reference being had to the accompanying drawings.

My invention consists in a combination of an air-pump, an air-condenser, and two or more tanks or reservoirs, and such suitable connections that air may be conveniently compressed to that degree and in such quantities as may be desired for driving light machinery.

In the drawings, Figure 1 is an elevation, and Fig. 2 a plan, of an apparatus embodying my invention.

The position of the lever on the condenser is different in one figure from that in the other, for better illustration. I have shown in the drawings a motive engine, to illustrate how the same may be connected with my apparatus for operation.

A is an air-pump, to be operated for compressing the air by hand or other power, and may be located near or at a distance from the other parts of the apparatus, being connected with the condenser B by a pipe, *a*, having a stop-cock, *s*.

The condenser B is a cylinder having a piston, G', to move therein, which has a vertical rod extending from the cylinder and connected to a lever, as shown. As I wish to have the piston-rod work closely through the cylinder-head or stuffing-box thereon, I find it convenient to have a stop-cock, P, on the cylinder in position as shown, that air or a vacuum above the piston may not impede the working of the piston.

I employ two or more tanks, C C', as reservoirs, which are connected with the condenser B by a pipe, *e*, common to them all. Each reservoir has a stop-cock, *t*, for opening or closing the passage from the reservoir to the condenser. The reservoirs C C' have a pipe, *f*, leading from them common to both. The passage from each reservoir to this pipe may be opened or closed by a stop-cock, *s*. The pipe *f* may be continued the distance required and lead to a motive engine, as shown.

The operation of the apparatus is as follows: I especially design to operate the pump A by manual labor, and by it pump and compress the air into the condenser B, by which operation the piston G' will be raised. Then having closed the cocks between the pump and condenser, opened one or more of the cocks *t* between the condenser and one or more reservoirs, and closed one or more of the cocks *s* leading from the reservoir or reservoirs to be filled, I press the piston G' downward, either by the weight shown or by hand, or by both. The consequence is that the air is greatly compressed in one or more of the reservoirs, as desired, from which the air may be used for driving machinery at times and in quantities as desired.

For the purpose for which I design my apparatus—namely, for accumulating in a short space of time power sufficient to drive light machinery, as for instance, a sewing-machine, for a much longer time than is required to accumulate the force, I consider my arrangement especially useful for the following reasons: The parts are few, simple, and easily kept in order. The manner of compressing the air in the condenser by means of the piston operated by a simple lever moved by a weight or by hand, or by both, is one that is free from complications, and readily understood and worked.

The combination, with the pump and condenser, of two or more small tanks for reservoirs, one or all of which may be opened to the condenser or to the motive engine rather than one large reservoir, is especially useful. It frequently happens that it is desirable to store only a small amount of power to run the motive engine but a short time, and when it may not be possible to spend time to compress a large amount of air. This can not be done where one large tank is used, or several small ones, having a passage one to the other always open. By having several small reservoirs, each of which can be shut off by itself, I am able to store just the amount of power desired; and also by such an arrangement one or more reservoirs can be filled, while the air at the required pressure is used from one or more other reservoirs. The space required for the apparatus can be more economically utilized by using several small reservoirs, and the appa-

ratus is more comely. Several small reservoirs require less cost in constructing, since lighter material can be used than in a large one. Compressed air so easily escapes by the slightest opening that it should be confined as closely as possible, and small reservoirs can be more surely made tight than large ones; and by shutting them off, as I do, from the condenser, (about the piston of which there is very apt to be a slight passage for escape,) and by shutting them off from each other and from the pipes, which may be necessary to have quite long, I insure the surest possible confinement of the compressed air.

I claim as my invention—

1. The combination of an air-pump, A, air-condenser B, having a piston, G', and the lever

G, and two or more reservoirs, C C', connected with the condenser and to a motive engine by pipes common to all the reservoirs, but so that each reservoir may be by stop-cocks or valves closed up by itself, substantially as and for the purpose hereinbefore set forth.

2. The combination of the condenser B, two or more reservoirs, C C', connected with the condenser and to a motive engine by conduits common to all the reservoirs, and stop-cocks or valves to confine the compressed air in each reservoir by itself, substantially as and for the purpose hereinbefore set forth.

HENRY MATTHES.

Witnesses:

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