

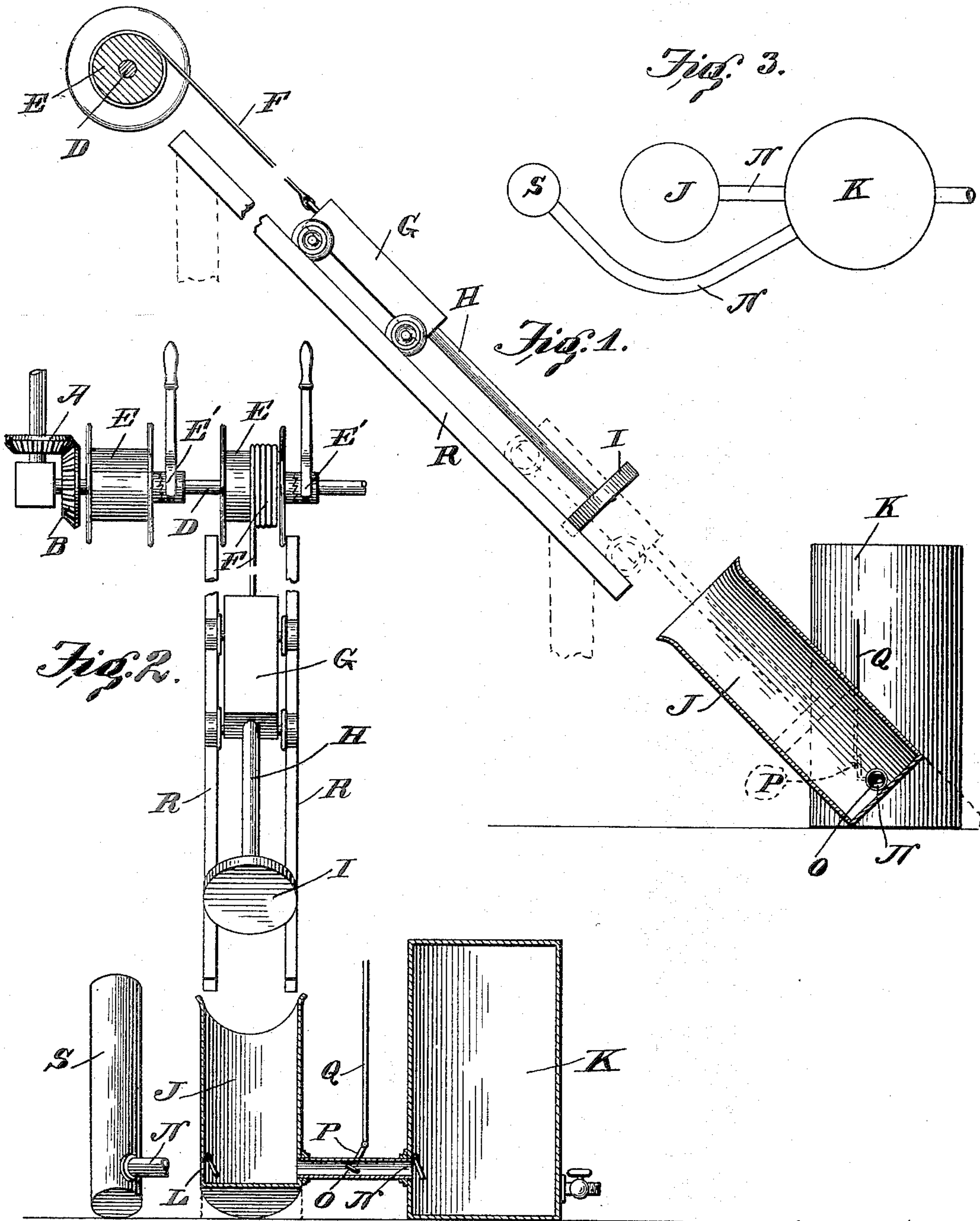
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Patented Jan. 2, 1900.

J. B. SAMPLE.  
FLUID COMPRESSOR.

(Application filed Feb. 16, 1899.)

(No Model.)



Witnesses:

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# UNITED STATES PATENT OFFICE.

JAMES BEARED SAMPLE, OF COLUMBUS, GEORGIA.

## FLUID-COMPRESSOR.

SPECIFICATION forming part of Letters Patent No. 640,324, dated January 2, 1900.

Application filed February 16, 1899. Serial No. 705,682. (No model.)

*To all whom it may concern:*

Be it known that I, JAMES BEARED SAMPLE, a citizen of the United States, residing at Columbus, in the county of Muscogee and State of Georgia, have invented certain new and useful Improvements in Fluid-Compressors; and I do hereby declare the following to be a full, clear, and exact description of the invention, such as will enable others skilled in the art to which it appertains to make and use the same.

This invention relates to an improved means for compressing fluids, such as air, and it is embodied in the construction and arrangement of parts presently to be described and defined in the claims.

Generally speaking, the invention comprehends an apparatus for compressing air or other fluids which are compressible by the impact of a weighted moving body free to descend from an elevated position by gravity and carrying or associated with a suitable piston arranged to work in a compressing-cylinder.

I have shown in the accompanying drawings an embodiment of the invention in a simple form for the purpose of illustration; but I desire it understood that the nature and principle of the invention may be embodied in various other forms of apparatus and the objects desired acquired by other means.

In the drawings I have shown the apparatus diagrammatically.

Figure 1 represents a side elevation of the apparatus, showing the parts in section. Fig. 2 represents an elevation at right angles to that of Fig. 1. Fig. 3 is a diagram plan of the compressing-cylinders.

The associated parts of the machine, as shown, are such as will constitute an operating device; but it is to be understood that the location and position of the elevating mechanism may be changed to any position desired.

In the drawings, A designates a master gear-wheel which is connected to any suitable power device. This master gear-wheel is beveled and engages with the vertical gear B, suitably supported. The shaft D of the wheel B extends through one or more winding-drums E, which are coupled thereto by suitable clutch mechanism E' of any convenient or

known type. By use of the clutch mechanism the winding-drums are allowed either a free independent rotation on the shaft D or may be turned by the shaft.

As shown in the drawings, below the plane of the winding-drums are conveniently two cylinders S and J, which have open upper ends directly in line with the drums. These cylinders are somewhat elongated, and each is provided with a valved inlet-opening L and a valved outlet-opening N, connecting with the closed storage-tank K, the valves of these openings being check-valves. In the passage-way N is located a regulating-valve O, independent of the check-valve, and which is provided with a crank P, having attached thereto a suitable actuating-rod Q, extending conveniently to a point in easy reach of the operator. The purpose of this valve O will be presently described. The cylinder S is connected with the storage-tank by the by-pass, as shown in the diagram Fig. 3, and has associated therewith duplications of the valves M and O.

It is a well-known fact that the impetus of a rapidly-moving body, such as water or a solid mass, when suddenly interrupted exerts a heavy force on the interrupting body and serves to displace that body. This statement, while being general and well known, is made for the purpose of more clearly defining the purpose of the invention, and in connection with this statement we would suggest the ordinary "water-ram." My present invention comprehends utilizing this force primarily for compressing air, and I may employ various devices for this purpose.

The device illustrated in the accompanying drawings comprehends the inclined track R, the inclination of which is substantially that of forty-five degrees. It may be, however, of greater pitch and in some instances may be directly vertical. In operation, however, I have found the inclined track to possess advantages. On this track is mounted a car or truck G, the wheels of which travel on the rails of the tracks R. This truck is loaded with some heavy substance or material to increase its force. On the lower end of this truck or carriage is secured a rigid piston-rod H, carrying on its lower end a piston-head I, which is designed to fit closely in the cylin-



der J directly below. The track R starts from a point conveniently below the plane of the outer drum E and terminates directly in line with the mouth of the cylinder J. The length of the track may be obviously varied and increased when it is necessary to increase the momentum of the moving object.

To elevate the car, a suitable chain, rope, or cable F is employed, the same being connected to the upper end of the car, the opposite end being secured to the drum.

I have described above a single track and car or truck and have omitted showing the companion car or truck for the cylinder S. This is simply omitted for the purpose of simplifying matters, it being understood that the cylinder S has a car or truck associated therewith and that either of the cars may be used at the same time or at different times.

The apparatus above described is, as will be noted, simple in its construction, and I have purposely made it so, that the spirit and nature of the invention will be readily comprehended. Various details in construction will be employed in the machine which are not necessary herein to describe.

In operation the weighted cars or trucks are first elevated by the winding of their connecting-ropes on the drums. While in their elevated position, the clutch or clutches are actuated, thereby releasing the drums, allowing them to rotate freely on the shaft without resistance, and thereby permitting the car to immediately descend on the tracks. The piston-head enters the upper end of the cylinder and is continued in its downward movement by the momentum of the car and forces the air in the cylinder out into the storage-chamber with great rapidity and force. This force and rapidity of the movement of the piston is such as in a measure to compress the air in the cylinder to an extent sufficient to interrupt the movement of the driving-piston, and this resistance finally checks the movement of the piston. The opening in the passage end is in size sufficient to permit the air to pass through, and the passage of the air is gradual, rather than sudden, so that a gradual movement of the piston is permitted. On the first movement of the piston, while the tank K contains no compressed air, it is necessary to adjust the small valve O, so that the amount of air passing through the passage end will be comparatively small, and thereby the downward movement of the piston will be gradually interrupted. After one or two charges of compressed air have been forced into the storage-tank the valve O is thrown open and the back pressure in the tank serving the purpose of the valve. The operation of the smaller cylinder S is substantially that of the larger cylinder J, the variation in size being simply a matter of convenience whenever less power is desired to operate the apparatus. When

it is desired to right the machine, it is only necessary to reclutch the winding-drum, thereby elevating the car or truck with its piston, the inlet-valve L permitting the air to enter the cylinder J and preventing suction.

I desire it here understood that any number of cylinders, with their associated compressing means, may be employed.

In the drawings the driving power is shown, as stated above. This may be used below, if necessary, and any obvious means may be employed for transmitting the power to the drums E.

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

1. In a compressing apparatus, the combination with a compressing chamber or cylinder having suitable inlet and outlet valves and an open upper end, of a freely-moving piston, a track or way for guiding the piston to the cylinder, means for elevating the piston out from and beyond the cylinder, means for releasing the piston so that it will fall of its own weight into the compressing-cylinder, a storage-tank communicating with the cylinder and a regulating-valve in the communicating passage, substantially as described.

2. In a compressing apparatus, the combination with a compressing cylinder or receptacle having an open upper end, of a storage-chamber, an inlet-valve to the cylinder, a regulating-valve in the connection and a connection between the storage-chamber and cylinder, a track or way leading to the cylinder, a weighted piston arranged in line with the cylinder and guided by the track or way, adapted to be moved into and out from the cylinder, means for elevating the piston out from and beyond the cylinder and means for releasing the piston so that it will descend by gravity, substantially as described.

3. In a compressing apparatus, the combination with a cylinder having an open upper end and a valve-inlet, a storage-tank having a connection with the cylinder, a regulating-valve in connection, the track or way in line with the upper end of the cylinder and extending upward from the cylinder, a weighted car on the track having a piston-rod at its lower end and a piston-head at the lower end of the piston-rod arranged in line with the cylinder and adapted to enter the same, means for elevating the car and moving the piston-head out from and a distance above the open end of the cylinder and means for releasing the car so as to allow the same to descend by gravity, substantially as described.

In testimony whereof I affix my signature in presence of two witnesses.

JAMES BEARED SAMPLE.

Witnesses:

HARRIETTE EYTENBENZ,  
J. H. JOHNSTON.