

No. 667,369.

Patented Feb. 5, 1901.

J. F. REDMAN.

PNEUMATIC PAINTING APPARATUS.

(Application filed Dec. 12, 1899.)

2 Sheets—Sheet 1.

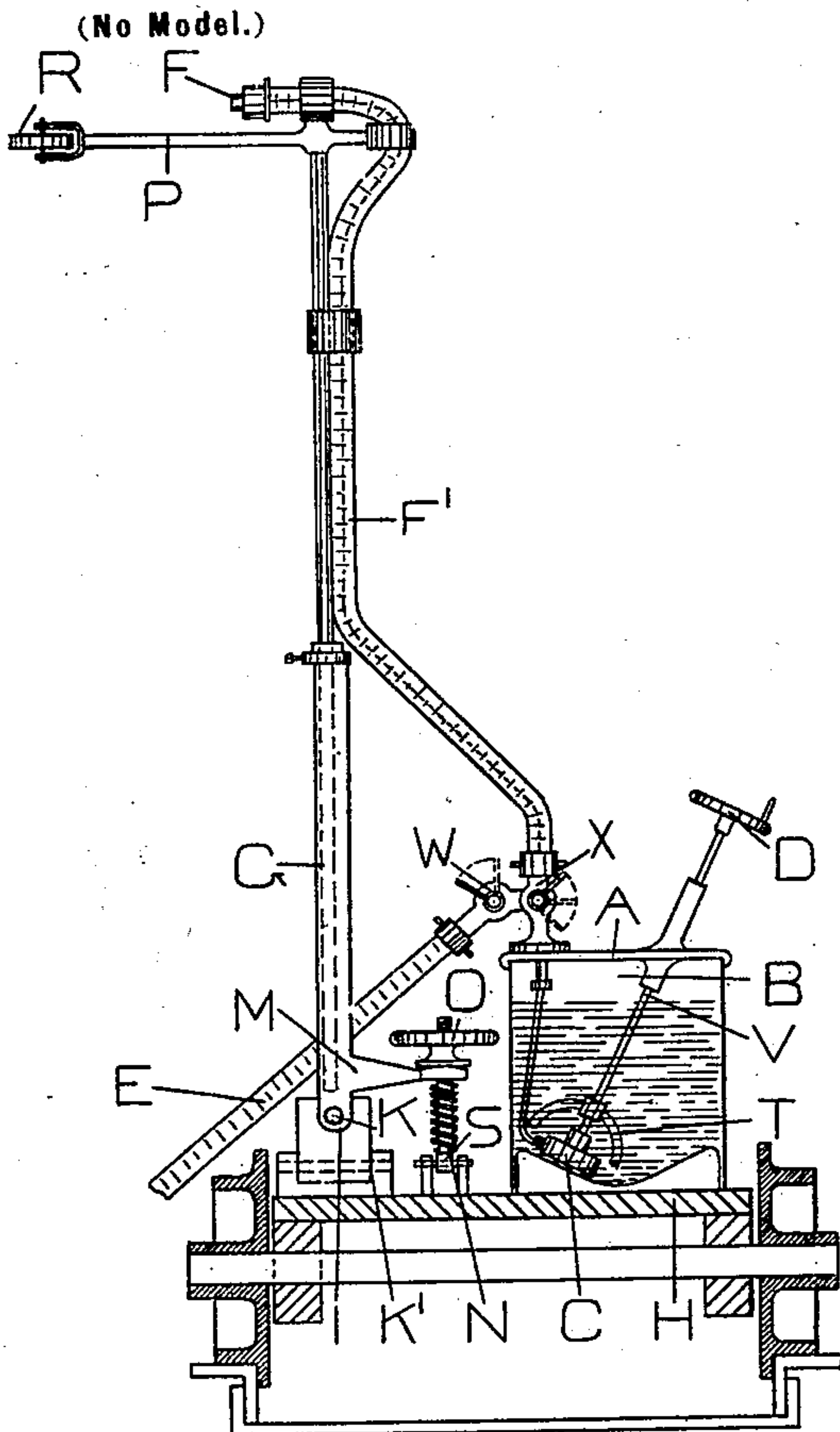


FIG. 1

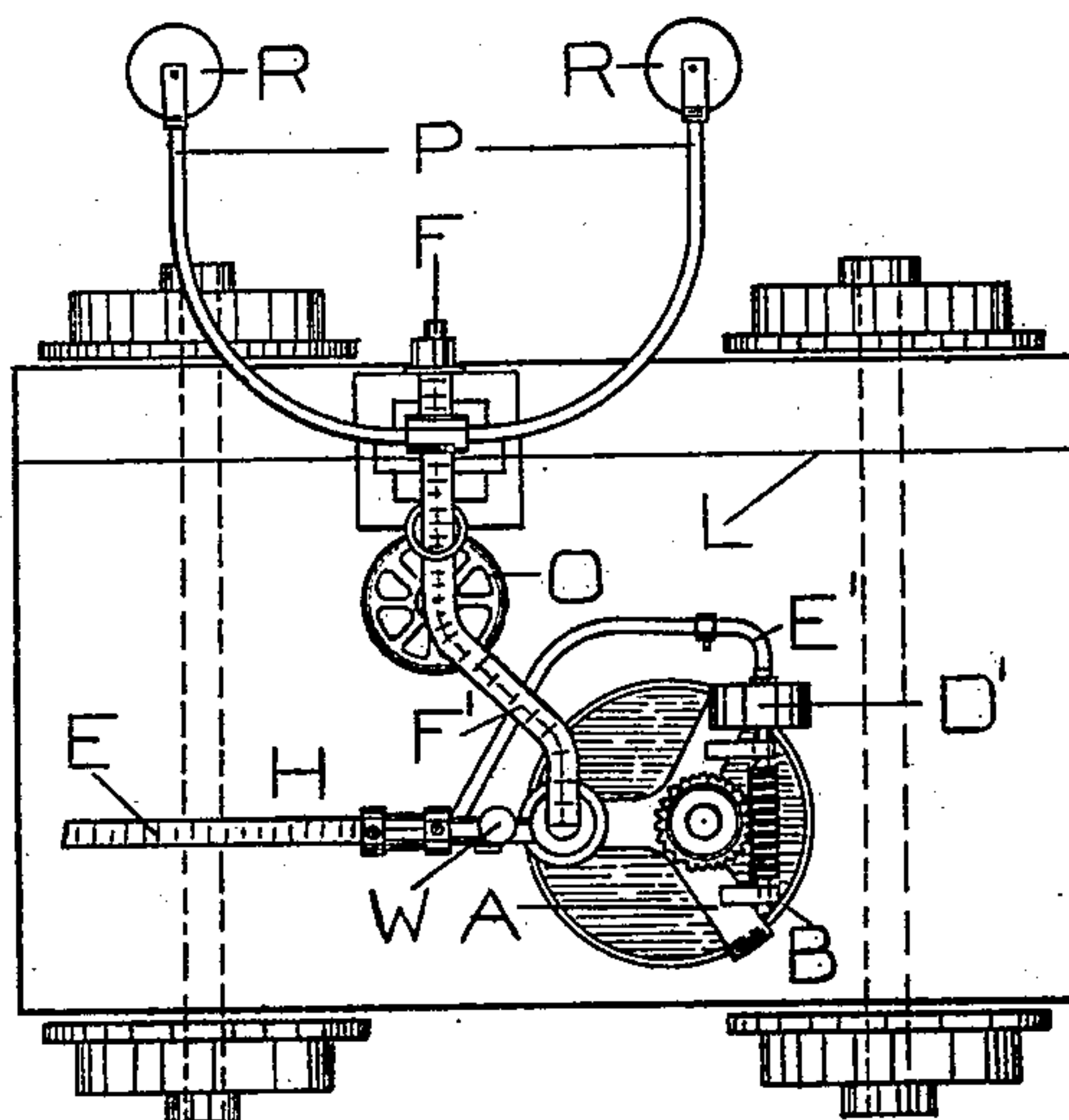
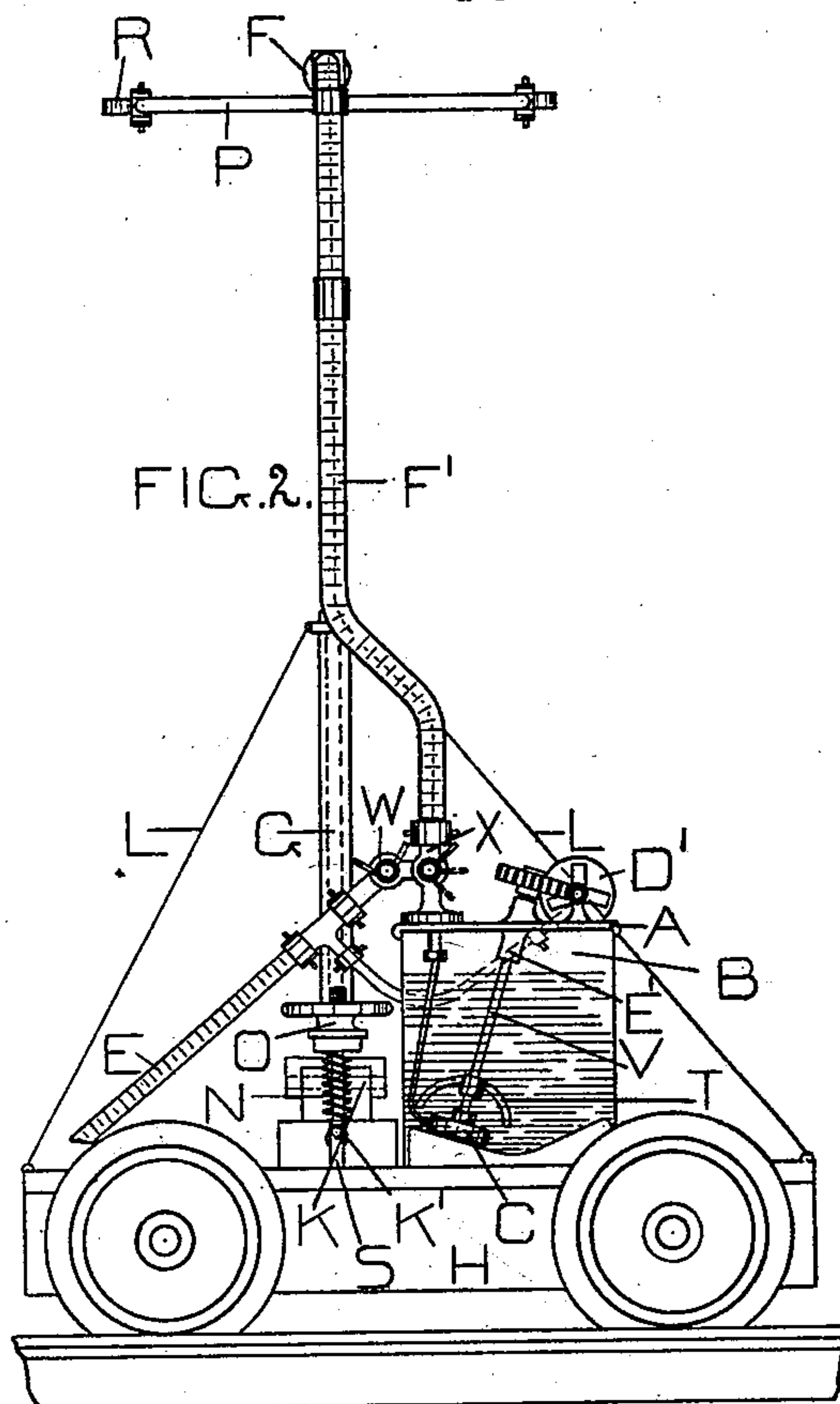


FIG. 3.

INVENTOR

Joseph F. Redman

ATTORNEYS

WITNESSES:

Ella L. Gies
O. W. W. W.

No. 667,369.

Patented Feb. 5, 1901.

J. F. REDMAN.

PNEUMATIC PAINTING APPARATUS.

(Application filed Dec. 12, 1899.)

(No Model.)

2 Sheets—Sheet 2.

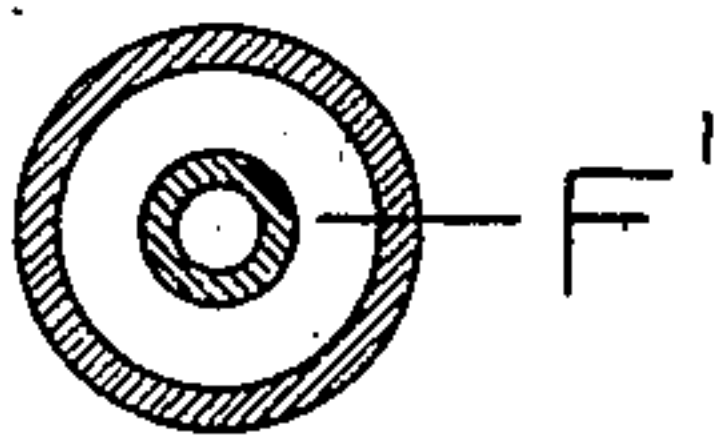


FIG. 4.

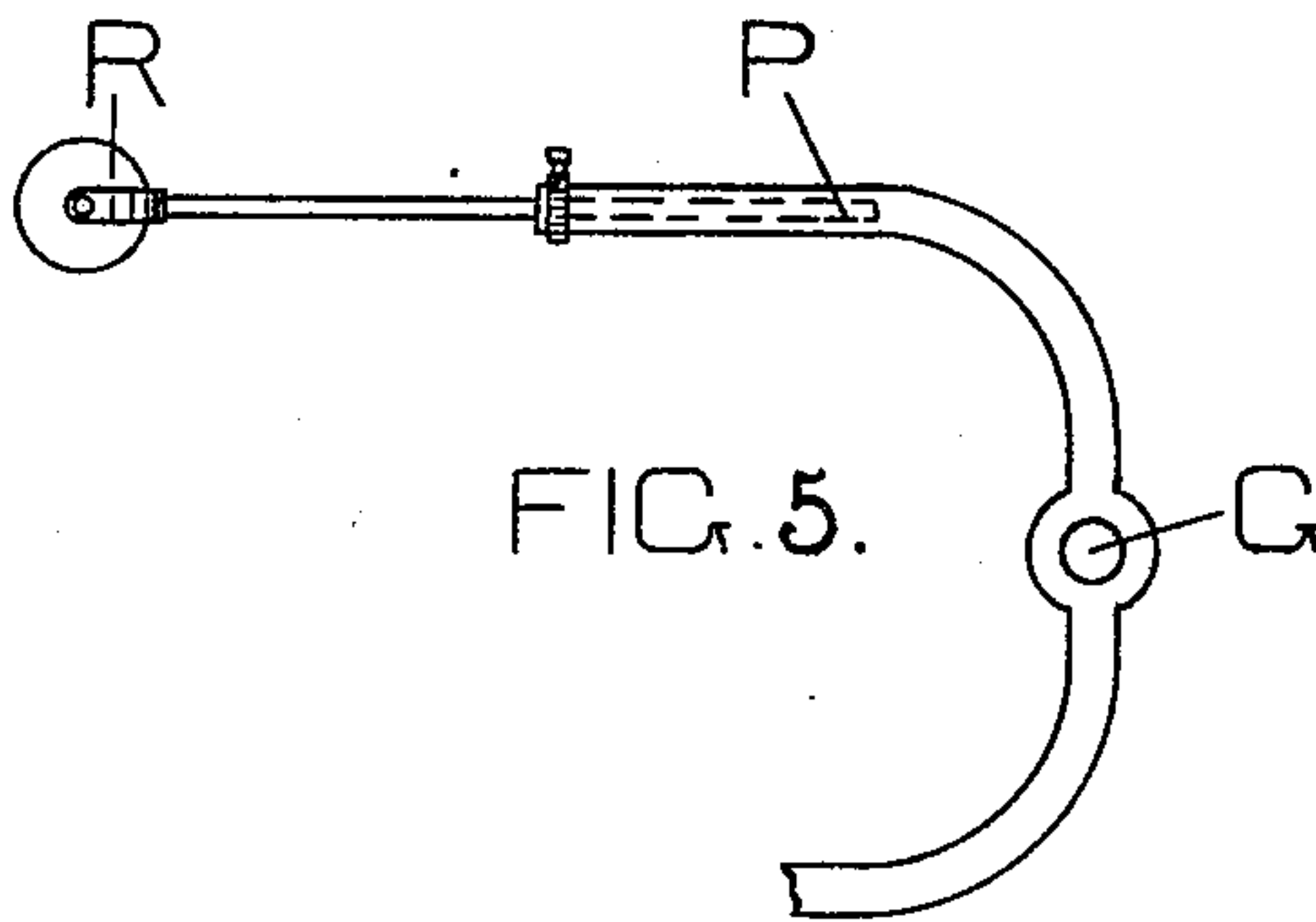


FIG. 5.

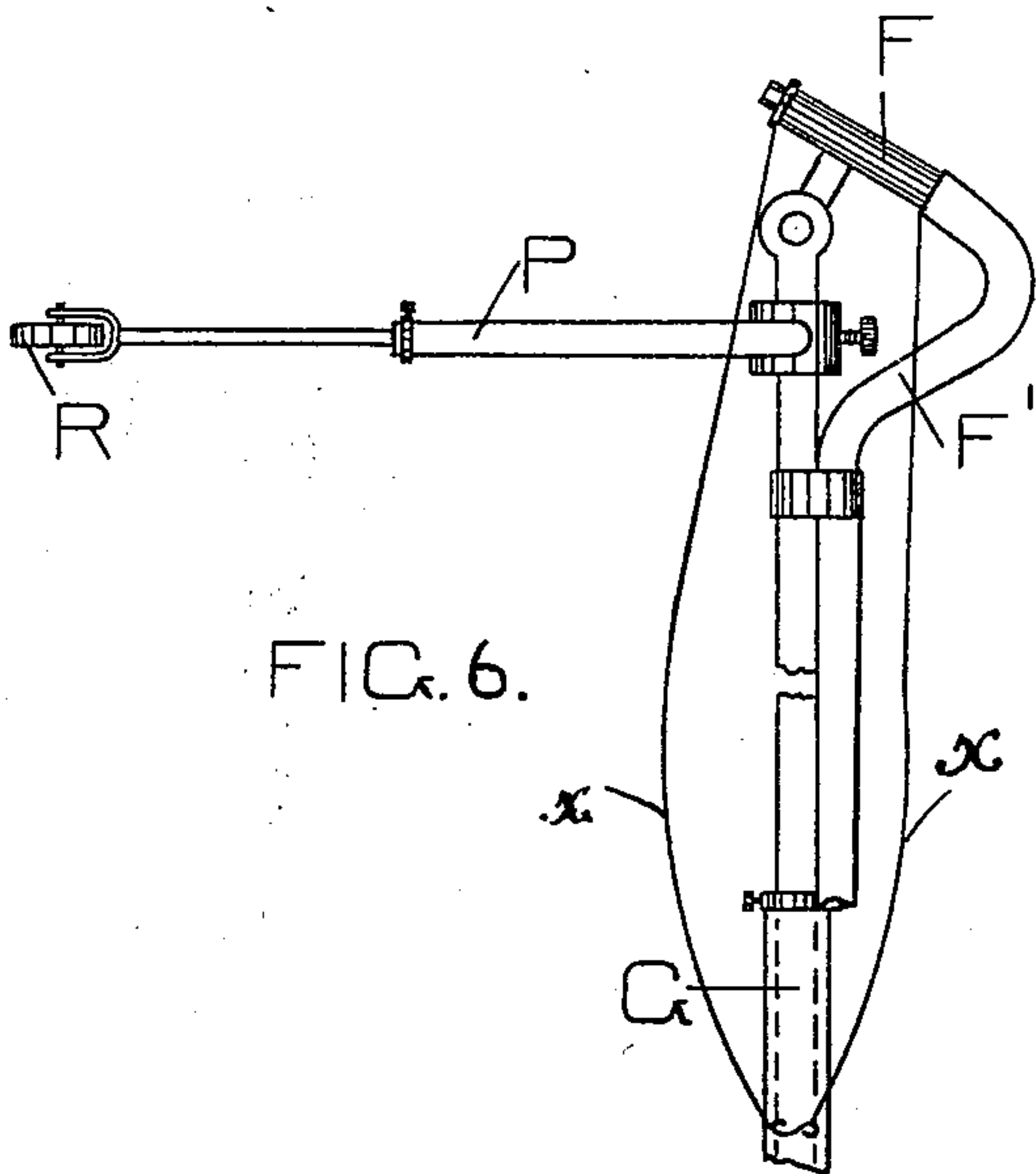


FIG. 6.

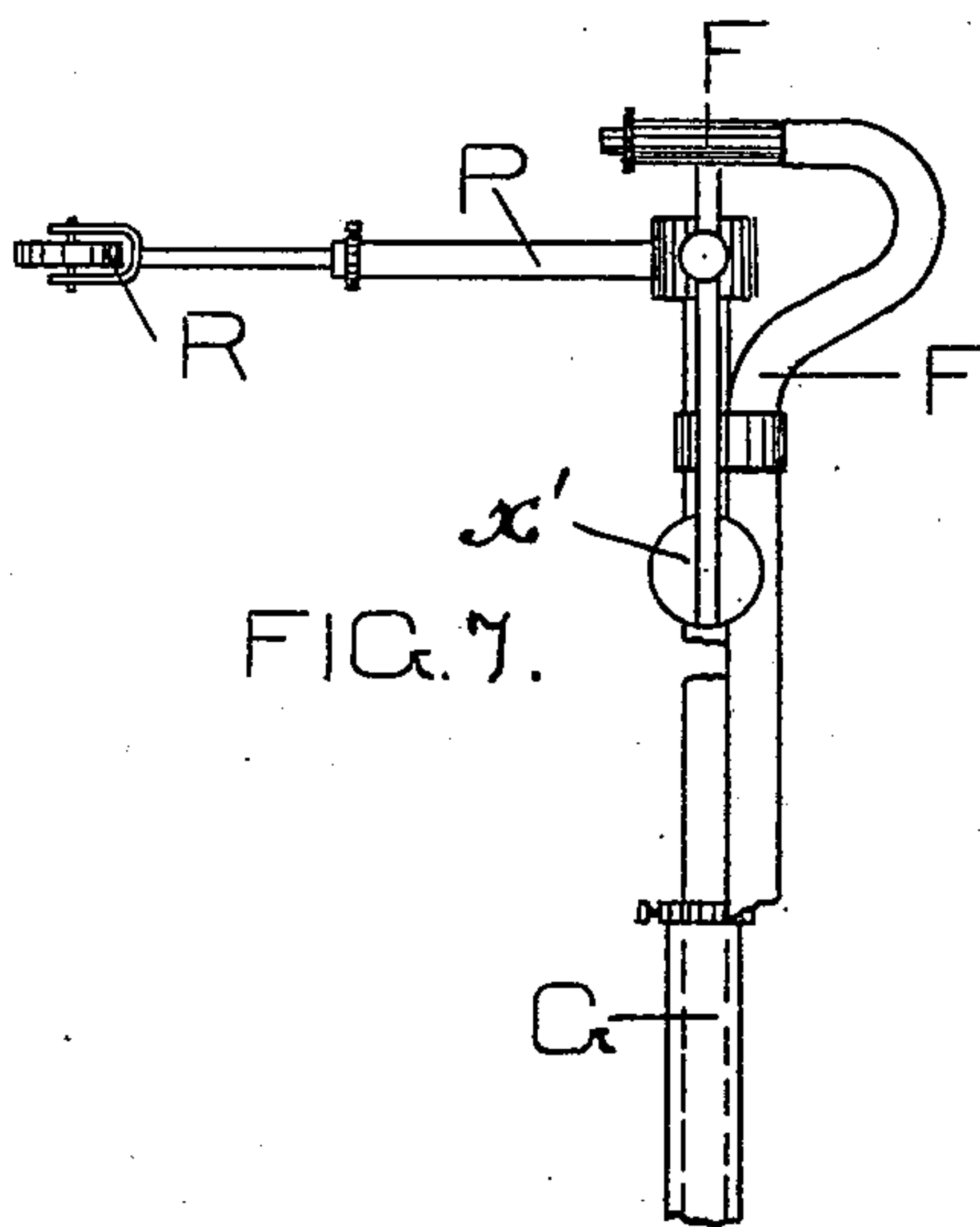


FIG. 7.

WITNESSES:

Ella L. Giles

Oldman

INVENTOR

Joseph Tell Redman

Richard R.

ATTORNEYS

UNITED STATES PATENT OFFICE.

JOSEPH FELL REDMAN, OF LONDON, ENGLAND.

PNEUMATIC PAINTING APPARATUS.

SPECIFICATION forming part of Letters Patent No. 667,369, dated February 5, 1901.

Application filed December 12, 1899. Serial No. 740,076. (No model.)

To all whom it may concern:

Be it known that I, JOSEPH FELL REDMAN, a subject of the Queen of Great Britain and Ireland, residing at London, England, have invented a new and useful Improvement in Apparatus for Applying Paint or other Composition to Surfaces, (for which I have made application for Letters Patent in Great Britain under No. 10,970 on the 25th of May, 1899,) of which the following is a specification.

This invention relates to apparatus for applying paint or other composition to surfaces, and has for its object the provision of means for dealing with surfaces of considerable vertical height in a simple, effective, and mechanical manner with a great reduction of labor as usually involved in such an operation and at the same time the arrangement of the device so as to be readily adaptable for use with ordinary stock paint-cans of commerce.

By means of this invention large structures, such as ships, pontoons, bridges, and similar devices having large and extensive surfaces, can be readily and efficiently coated with great celerity and with a small amount of labor by the spraying of paint thereon through the medium of compressed air.

In order that my invention may be the better understood, I will now proceed to describe the same in relation to the accompanying drawings, reference being had to the letters marked thereon.

Like letters refer to like parts in the various figures.

Figure 1 is an end elevation, partly in section, of my invention arranged with a pump to be operated by hand or other convenient power. Fig. 2 is a side elevation of the same, but with an air-motor adapted to drive the pump. Fig. 3 is a plan of Fig. 2. Fig. 4 is a detail view showing parts in section. Fig. 5 is a detail plan view of the pipe-supports. Figs. 6 and 7 are detail views.

To carry my invention into effect, I provide a frame A, of preferably skeleton formation, adapted to rest upon or within a tank B, such as the ordinary paint can or drum of commerce. This frame A carries a pump C or other liquid-raising device, which can be operated by a hand-wheel D, as shown in Fig. 1, or by a motor D', as shown in Figs. 2 and 3,

the particular motor in this case being a rotary air-motor, and the supply of air for driving such motor is taken from the pipe E by the pipe E' to the motor D'. The pipe E has a connection to the pipe F' for supplying the nozzle with air to spray the paint. As will be hereinafter explained, I make the pump C give a positive feed of paint to the spraying-nozzle, and so get over the difficulties of feed when the statical head of paint has to be maintained by air-pressure contained within a closed paint-reservoir as arranged in many devices hitherto existent in which the feed of the paint is dependent on and inversely proportioned to the vertical height of the nozzle above or below the paint-receiver.

In an apparatus in which the head of paint is maintained by air-pressure acting direct the head is directly proportional to the pressure, as the loss of energy in transmission is practically *nil*. In fact, such an arrangement is similar to a barometer; but in the apparatus described these conditions do not obtain, because you have absorption of energy in the friction of the motor, the stirring action of the agitator driven by the motor, the friction and slip or leak of the liquid-pump and the friction of the liquid in all the pipes, and, lastly, the load on the pump due to the head of liquid. When these are taken into consideration, it will be found that the work of raising the liquid is only a mere fraction of the whole—say five per cent. as a maximum—and if this load is reduced, say, one-half you have only a variation of two and one-half per cent. of the whole load, a change which will not materially affect the speed of the pump, and hence the quantity of paint pumped per unit of time. This is particularly the case if the motor is geared down with respect to the pump and the former runs at high speed, so that the efficiency of the motor is low. It may be stated that the motor is fitted with a governing device of the usual pattern to maintain its revolutions at a constant speed irrespective of the variations in the head of paint.

A rough statement of the absorption of energy may be put as follows: total energy in compressed air, one hundred; energy lost in motor, forty; energy lost in pump, thirty; energy lost in agitator, fifteen; energy lost in

friction of liquid in pipes, &c., ten; energy available for head of paint, five; total, one hundred.

I provide a device G upon a trolley or carriage H, which is adapted as a long arm to carry the spraying-nozzle for dealing with elevated surfaces. This arm G is preferably of a tubular form and is made telescopic, so as to be extended or shortened, as circumstances require. It is pivoted at its lower part I by swivel-joints K K' to the trolley, so as to be moved about two horizontal axes at right angles to one another to enable the nozzle to move to or from the trolley relative to the surface to be painted and angularly in a vertical plane parallel to the direction of motion of the trolley to lower the nozzle or place it forward or aft of the trolley. These movements are controlled by guys L or their equivalent in one plane, which are fastened to the trolley, and by means of an arm M, attached to the lower end of the long arm G and acted on by a spiral spring N to press the nozzle F toward the surface to be painted, and a screw and hand-wheel nut O to restrain it from such movement to too great a distance. In order to maintain the nozzle F at a fixed distance from the surface to be painted, so as to insure a uniform effect or coating thereon, I arrange a guiding device P in the form of a U-shaped arm carrying wheels R, which roll along the surface to be painted.

The screw-restraining device O is pivoted on the trolley on an axis S, coinciding with the axis K', round which the long arm moves in its fore-and-aft rocking motion, so that the device O readily follows the movement of the arm G. The shaft V of the rotary pump C carries an agitator T, adapted to stir up the paint or other composition in the tank or can B.

The pipe F is double, as shown in the cross-sectional view thereof, Fig. 4, and is arranged so that the paint is forced up the inner pipe while the air is forced up the annulus around it, (the inner pipe.)

It will be noted that when the contents of one can or drum of paint have been used the frame A, with its gearing, can be lifted out of the empty drum, the latter removed and a full one substituted therefor, when the frame can be replaced in position thereon.

The cock W is arranged in the main air-pipe E to regulate the amount of air delivered to the nozzle F, and the cock X is provided in the delivery-pipe from the pump C to regu-

late the amount of paint delivered to the spraying-nozzle.

As shown in Fig. 5, the arm P may be made telescopic, so as to be adjustable in length.

As shown in Figs. 6 and 7, the spraying-nozzle may be pivotally supported, and it may be controlled, as shown in Fig. 6, by guys x or, as shown in Fig. 7, by a weight x' , which will hold said nozzle in a predetermined position by gravity.

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

1. An apparatus for applying paint or other composition to surfaces consisting of a nozzle adapted to spray liquid by means of air, a pipe connecting said nozzle with a supply of compressed air, an open receptacle or reservoir for containing the said liquid, a positively-acting liquid-pump, adapted to give a constant delivery of liquid irrespective of the hydraulic head to be overcome, means of communication leading from the said reservoir to the said pump, and a delivery-pipe leading from said pump to the said spray-nozzle, substantially as described.

2. In a liquid-spraying apparatus for covering surfaces, in combination a spray-nozzle adapted to spray liquid by means of air, a pipe connecting said nozzle with a supply of compressed air, an open receptacle or reservoir for containing the said liquid, a positively-acting liquid-pump, means of communication leading from the said reservoir to the said pump, a delivery-pipe leading from the said pump to the said spray-nozzle, an air-motor adapted to drive the said liquid-pump and a pipe connecting the air-motor with the supply of compressed air, substantially as described.

3. In a liquid-spraying apparatus, in combination, a spray-nozzle, a long arm adapted to carry the said nozzle, a truck or trolley pivotally carrying the long arm, means for controlling the movements of the long arm, and a guide at the upper part of the long arm adapted to maintain the nozzle at a predetermined and constant distance from the surface to be coated with liquid, substantially as described.

In witness whereof I have hereunto set my hand in presence of two witnesses.

JOSEPH FELL REDMAN.

Witnesses:

REGINALD WILLIAM JAMES,
RICHARD A. HOFFMANN.