

(No Model.)

A. CAMPBELL.
STEAM PUMPING ENGINE.

No. 560,608.

Patented May 19, 1896.

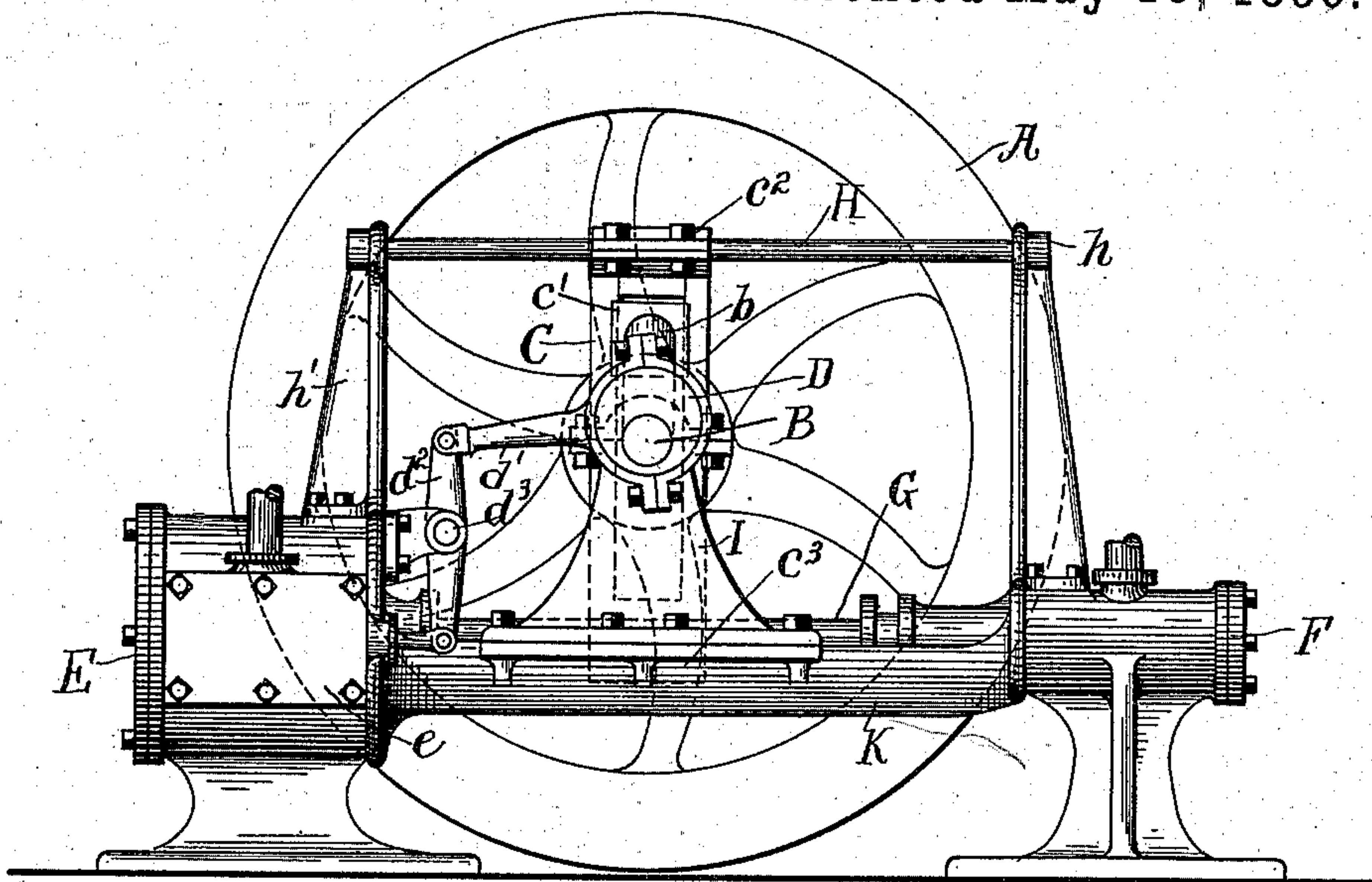


Fig. 1.

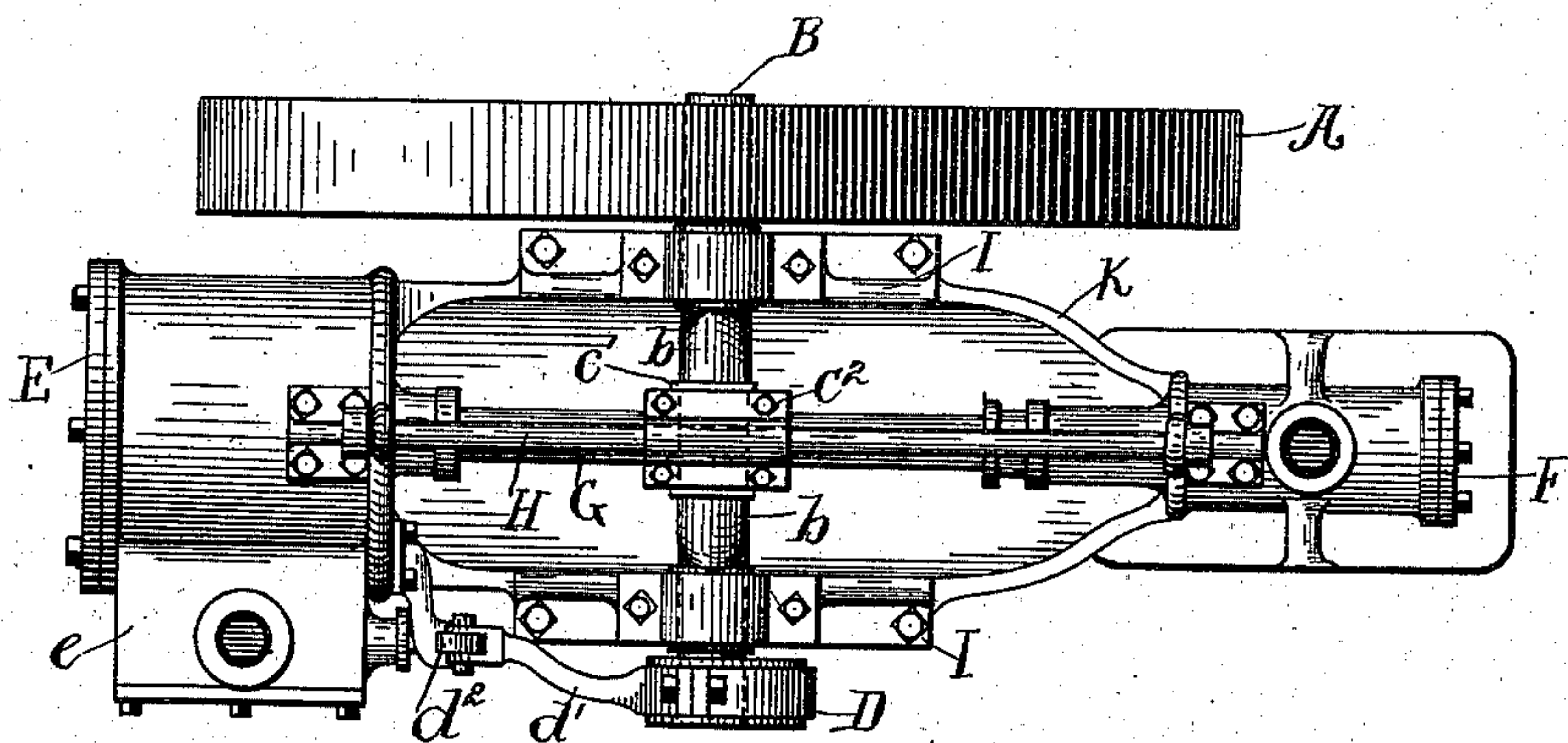


Fig. 2.

WITNESSES:

Fred W. Hersey.

Grant Burroughs.

INVENTOR:

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by E. C. Dacey,
his Atty.

UNITED STATES PATENT OFFICE.

ARCHIBALD CAMPBELL, OF CHICAGO, ILLINOIS.

STEAM PUMPING-ENGINE.

SPECIFICATION forming part of Letters Patent No. 560,608, dated May 19, 1896.

Application filed March 7, 1894. Renewed December 2, 1895. Serial No. 570,862. (No model.)

To all whom it may concern:

Be it known that I, ARCHIBALD CAMPBELL, a citizen of the United States, residing at Chicago, in the county of Cook and State of Illinois, have invented certain new and useful Improvements in Steam Pumping-Engines, of which the following is a specification.

The object of my invention is to produce a pump which will pump anhydrous ammonia as well as other liquids, and one which can be made cheaply. With the general construction of pumps the above-named liquid cannot be pumped, as the piston of the pump will either stop entirely at the end of each stroke or else it will make a jump in such a manner that it is very destructive to the pump, if it will run at all. I aim to overcome these difficulties and have a pump that will run easily and with a uniform motion. I attain these objects by the means illustrated in the accompanying drawings, in which—

Figure 1 is a side elevation of a pump constructed according to my improvements, showing the balance-wheel, cross-head, and the various other connections. Fig. 2 is a plan view of the same, showing said wheel, &c., in plan.

Similar letters refer to like parts in both the views.

In the drawings, A represents the balance-wheel, which may be made of any appropriate size or pattern. This wheel is keyed to the shaft B, which shaft is bent into a continuous or double crank *b*, which crank works in the box *c'*.

C represents the cross-head or guide, which is fastened securely to the piston-rod G, and which moves back and forth with said piston-rod. This cross-head is supported at the upper end by a rod H, which rod is supported at each end by the brackets *h* and *h'*, fastened to the liquid and steam cylinders, respectively. The cross-head has at the upper end a box which moves on this rod H, said box being lettered *c*² in the drawings. The cross-head C is slotted in its middle portion to allow the box *c'* to play up and down in it, said play being equal to the throw of the crank in each direction—that is, up and down. Through this box *c'* passes the crank *b* of the shaft.

D represents the eccentric, which is on the

end of the shaft B; but it may be placed at any convenient place. This eccentric is enabled to move the slide-valve of the steam-cylinder by means of the eccentric-arm *d'*, the intermediate lever *d*², and the fulcrum of said lever *d*³, by which arrangement the eccentric will move the slide-valve in the required manner.

I represents the bearings or supports of the shaft B, which bearings are fastened to the connecting-frame K of the pump. E is the steam-cylinder, which may be of any approved pattern, and F is the pump-cylinder, which for ammonia must be provided with an extra long gland or stuffing-box, as is shown in the drawings. The connecting-frame K is dish-shaped in form, being substantially a longitudinal section of a cylinder. It is so attached at its ends to the steam and pump cylinders as to keep them in alinement, and by being situated beneath the main working parts of the device catches any drippings of oil. Its shape also enables it to sustain great strain. It is to be observed that by means of the construction described the crank of the main driving-shaft is situated in substantially a central position above the connecting-frame, and also that the integrity of the said frame can be preserved, as it is not necessary to cut any of it away to allow the passage of any of the operative parts. In operating this pump by this means the steam and pump cylinders are operated as usual. As the cross-head C is attached to the piston-rod, it passes back and forth with said piston-rod in its movement, and in so passing back and forth it moves the box *c'* between said cross-head back and forth, and as the crank *b* is in said box *c'* the crank will then be given a circular movement, thus turning the balance-wheel A, which wheel will be kept at a certain speed by this movement. When the piston of the pump comes to the end of the cylinder, it will be carried over that point by the accumulated momentum in the fly or balance wheel. Thus by this arrangement I am enabled to run a pump successfully in pumping anhydrous ammonia and am enabled to prevent the pump sticking at the end of the stroke or jumping as it now does with the construction of pumps in use.

Having thus described my invention, what

I desire to claim and secure by Letters Patent is—

5 In a pump of the class described, the combination of the steam and pump cylinders, the frame connecting the said cylinders having a form substantially dish-shaped, the pistons respectively mounted in the said cylinders and connected by a common piston-rod, the brackets respectively secured to opposite
10 ends of the said frame, the guide-rod carried by the said brackets substantially parallel to the piston-rod, the cross-head attached at its lower end to the piston-rod and having a box

formed in its upper end registering with the guide-rod, the box movably mounted in a vertical slot formed in the cross-head, the brackets secured to the opposite edges of the connecting-frame, and the shaft journaled in the said brackets and having a crank intermediate of the same, the said crank being
15 journaled in the box mounted in the cross-head, substantially as described. 20

ARCHIBALD CAMPBELL.

Witnesses:

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