Apr. 24, 1923.

N. A. PETRY

1,453,178

AIR PUMP

Filed Feb. 1, 1921

4 Sheets-Sheet 1

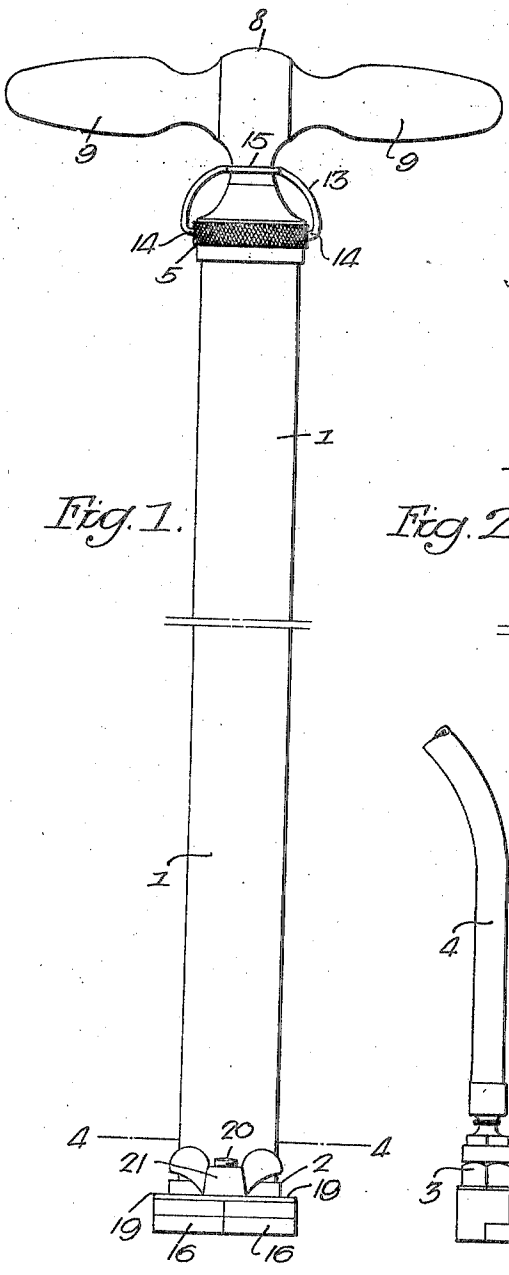


Fig. 1.

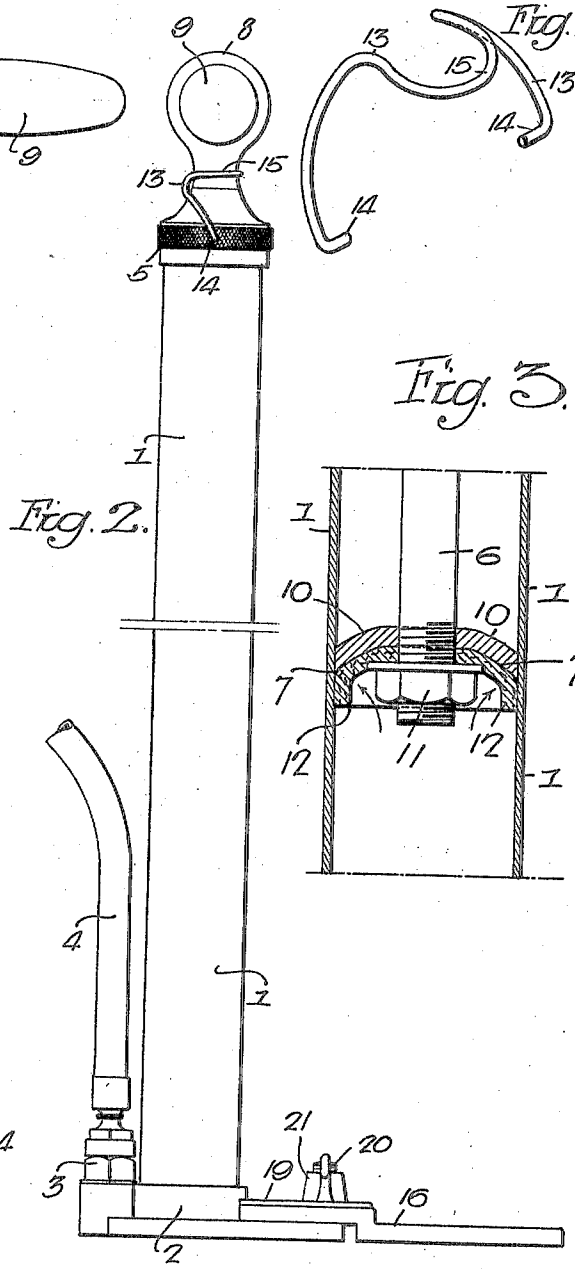


Fig. 2.

Fig. 2a.

Fig. 3.

Inventor:—
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by his Attorneys.—
Howson & Howson

Apr. 24, 1923.

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4 Sheets-Sheet 2

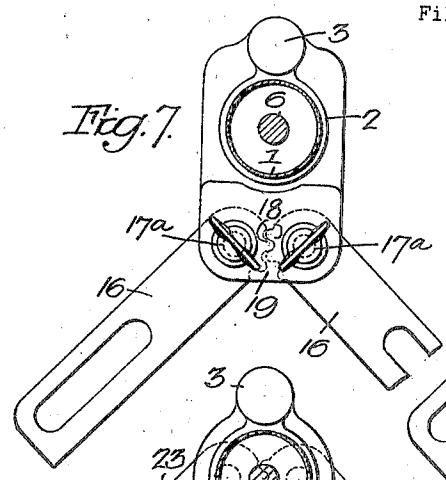


Fig. 7.

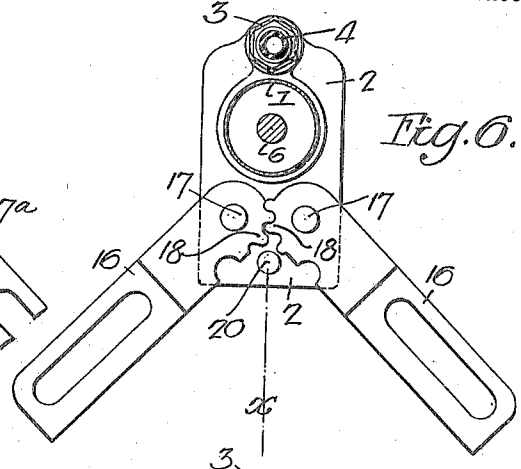


Fig. 6.

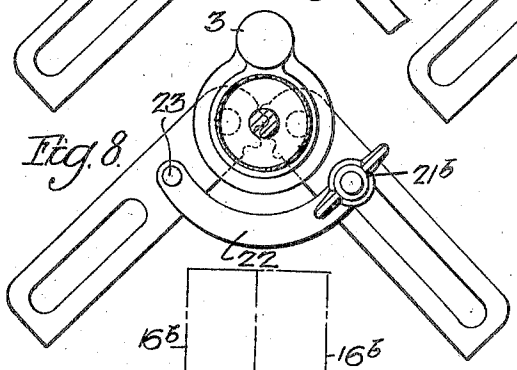


Fig. 8.

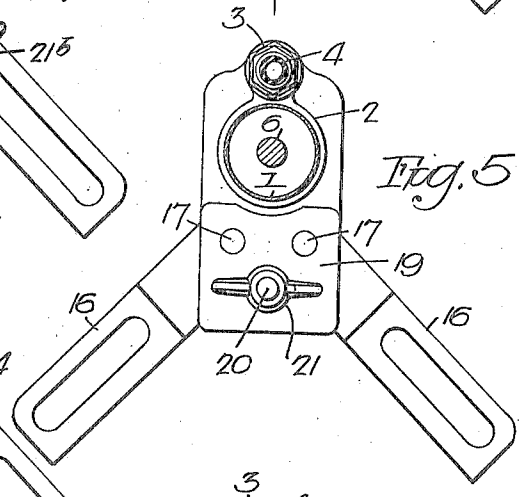


Fig. 5

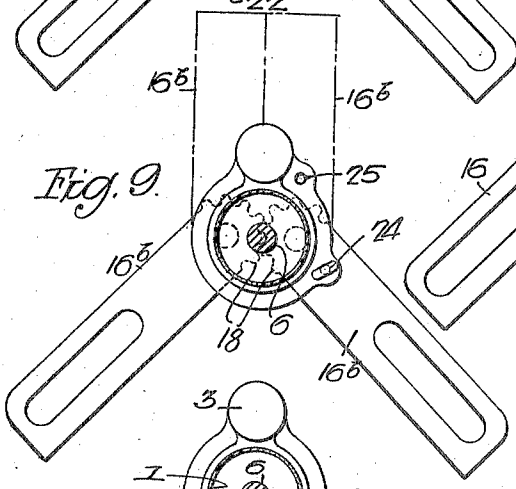


Fig. 9.

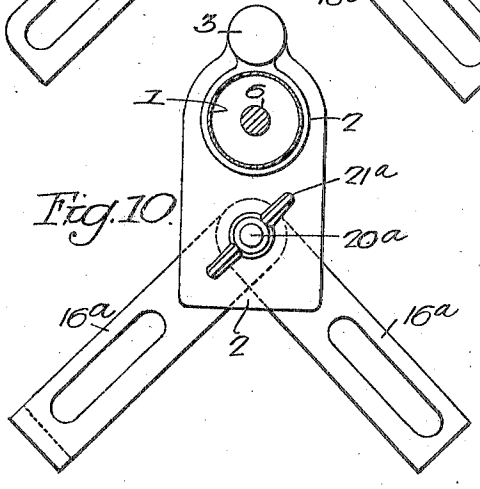


Fig. 10.

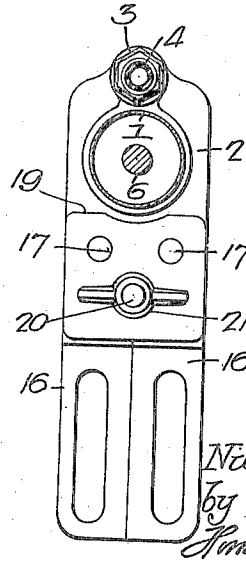


Fig. 4.

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Simon Thomson

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Fig. 11.

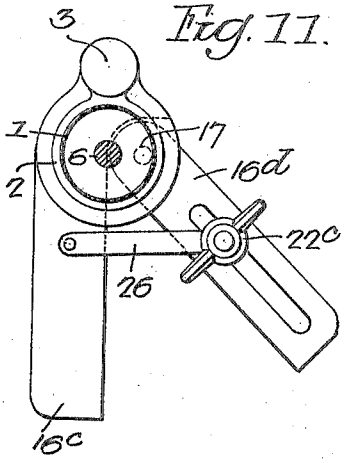


Fig. 12.

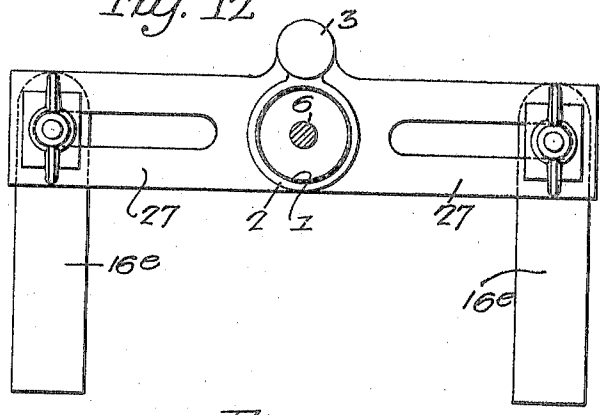


Fig. 13.

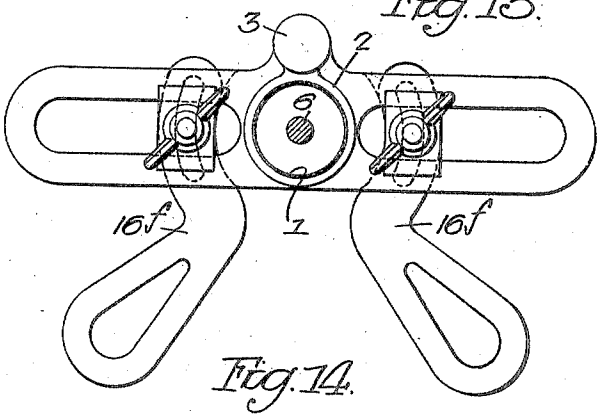
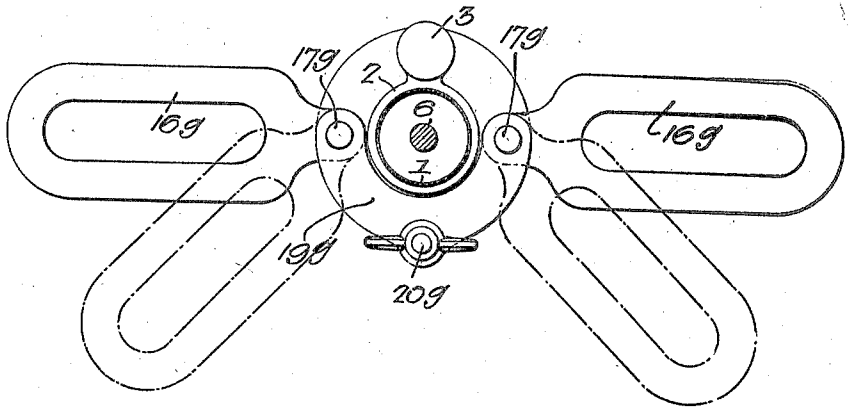


Fig. 14.



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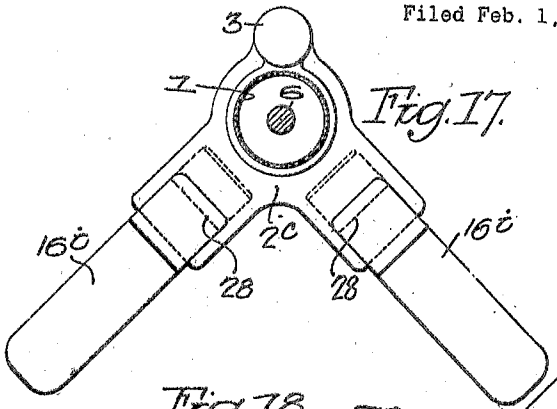


Fig. 17.

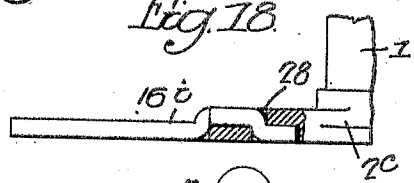


Fig. 18.

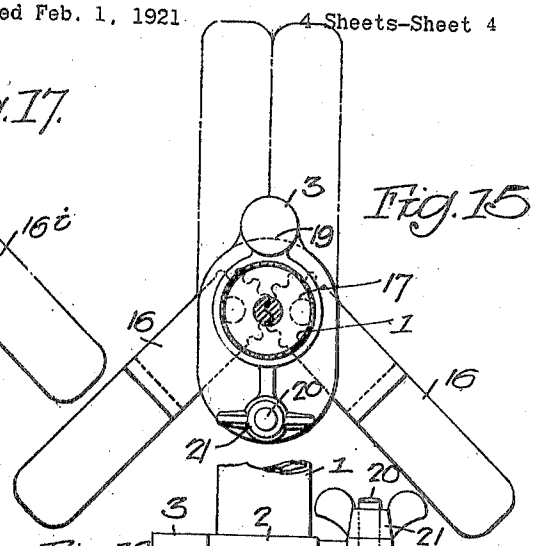


Fig. 15

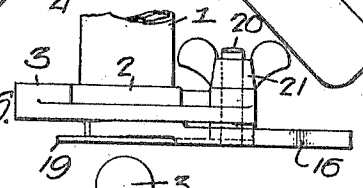


Fig. 16.

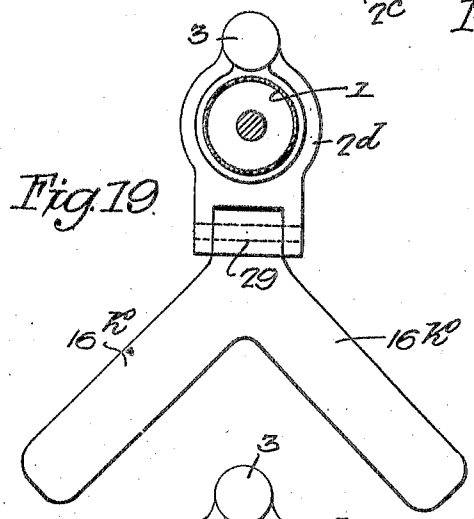


Fig. 19.

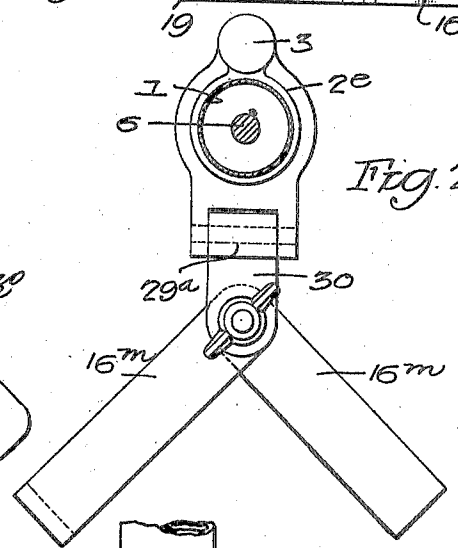


Fig. 20.

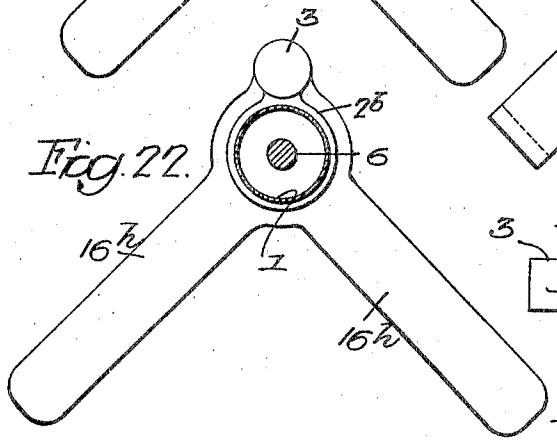


Fig. 22.

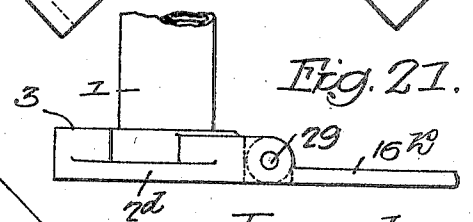


Fig. 21.

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Patented Apr. 24, 1923. 1,453,178

UNITED STATES PATENT OFFICE.

NICHOLAS A. PETRY, OF PHILADELPHIA, PENNSYLVANIA.

AIR PUMP.

Application filed February 1, 1921. Serial No. 441,586.

To all whom it may concern:

Be it known that I, NICHOLAS A. PETRY, a citizen of the United States, residing in Philadelphia, Pennsylvania, have invented Improvements in Air Pumps, of which the following is a specification.

My invention relates to certain improvements in air pumps particularly used for inflating vehicle tires and one object of my invention is to provide a pump with a foot plate having members so arranged that the pump structure can be readily held by the feet in an easy position while the piston is being reciprocated.

A further object of the invention is to provide the plate with movable members so that they can be folded into comparatively small compass.

A further object of the invention is to provide a means for locking the handle to the pump casing, and a still further object is to provide a piston of the pump in which the packing will adhere closely to the walls of the casing.

These objects I attain in the following manner, reference being had to the accompanying drawings, in which,

Figure 1 is a view in elevation of my improved pump, showing the foot plates closed;

Figure 2 is a side view of the pump illustrated in Fig. 1;

Fig. 3 is a sectional elevation showing the construction of the piston and the cup washer;

Fig. 4 is a sectional plan view on the line 4—4, Fig. 1;

Fig. 5 is a view similar to Fig. 4, showing the foot plates extended;

Fig. 6 is a view similar to Fig. 5 with the top plate removed to illustrate the method of gearing one foot plate to the other;

Fig. 7 is a view illustrating a modification in which each movable section is independently held by a thumb nut;

Figs. 8 and 9 are views of modifications in which the pivots of the foot plates are directly under the pump cylinder casing;

Fig. 10 is a view showing one foot plate overlapping the other, both plates being held by a single thumb nut;

Fig. 11 is a view showing one foot plate fixed and one plate movable.

Figs. 12 and 13 are views showing an extended base with independent adjustable foot plates;

Fig. 14 is a view showing another manner of pivoting the adjustable foot plates;

Figs. 15 and 16 are views showing the pivots for the foot plates located under the cylinder of the pump and a clamp plate provided with a thumb nut for locking the two foot plates in position;

Figs. 17 and 18 are views showing detachable foot plates;

Figs. 19, 20 and 21 illustrate hinged foot plates; Fig. 22 illustrates a foot plate in which the two lateral extensions are set at an angle and made integral with the base; and

Fig. 23 is a perspective view of the handle locking bail.

Referring in the first instance to Figs. 1 to 6 inclusive, 1 is the cylinder of the pump made in the ordinary manner and secured to a base 2 in which is a passage for the air. 3 is an air valve casing which is attached to a flexible tube 4, having the usual coupling by which it can be secured to the nipple of the air valve of an inflatable tire. At the upper end of the casing is a cap 5 screwed onto the casing in the ordinary manner and in this cap is an air vent. Extending through the cap is a piston rod 6 having a piston 7 thereon, Fig. 3, which is arranged to reciprocate in the casing and at the upper end of the rod 6 is a handle 8 having hand holds 9 at each side, as clearly shown in Figure 1.

The lower end of the rod 6 is screw threaded, and mounted on this screw threaded rod is a disk 10 convexed on its upper side as shown in Fig. 3 and having a screw threaded opening to receive the screw threaded end of the rod 6. Clamped against the concaved portion of the disk 10 by a nut 11 and a washer is a flexible cup 12 shaped as shown. This arrangement causes the cup to bear against the walls of the cylinder and when the plunger is descending the tendency of the air will be to press against the cup in the direction of the arrow

and hold it tight against the walls of the cylinder and thus prevent leakage. The cup on the return stroke will readily yield, bending at a point back of the edge of the disk 10.

In order to lock the handle to the pump casing when the pump is not in use, I provide a bail 13 (Fig. 23), having bent ends 14, which extend into openings in the cap 5 and has a reduced portion 15 which is adapted to partially encircle and clamp the handle as shown in the drawings. By simply throwing the bail back, the handle is released.

Pivotally mounted on the base 2 of the pump are foot plates 16 which are pivoted at 17 to the base 2, and the plates have teeth 18 which intermesh so that when one foot plate is moved the other moves with it. The foot plates when extended will be located the same distance from a center line x, Fig. 6. 19 is a clamp plate having holes through which the pivots 17 extend and also having a hole through which the screw bolt 20 extends from the base and this bolt is provided with a wing nut 21 on turning which the foot plates 16 are clamped either in the extended or retracted position. The plates may be arranged at different angles, depending upon the user of the pump, but I find that the angle shown in Figs. 5 and 6 accommodates the feet of the user in a natural position and tends to keep the pump clear of the body of the user so that he can make a full stroke without fatigue and also it will prevent the piston rod when extended from coming in contact with the clothing, as by this means the pump cylinder is held a greater distance away from the body than in pumps of the ordinary construction where the feet have to be placed at each side of the cylinder.

In Fig. 4 I have illustrated the two foot plates 16 moved close together and when in this position the pump takes comparatively little room in an automobile or other vehicle. In Fig. 10 I have shown the two foot plates 16^a mounted on a single bolt 20^a on which is a wing nut 21^a so that the bolt acts as a pivot as well as a clamping means.

In Fig. 7 I have illustrated the pivot pins 17^a in the form of set screws so as to lock the plates in position. In Fig. 8 I have shown the pivots for the foot plates directly under the cylinder. In this instance the two plates are geared together and a segment 22 is pivoted at 23 to one of the foot plates and is adjustably held by a wing nut 21^b to the other foot plate.

Fig. 9 illustrates a construction somewhat similar to Fig. 8 with the exception that the gear teeth of the plates 16^b are extended and the pin 24 locks the foot plates in the extended position and when the pin is placed in the hole 25 locks the plates in a closed position as shown by dotted lines in said figure.

Figure 11 illustrates a fixed foot plate 16^c which in the present instance forms part of the base and a pivot foot plate 16^d adjustably held to the fixed plate by a strap 26 and wing nut 22^c.

In Fig. 12 I have illustrated the base 2 having lateral extensions 27 and foot plates 16^e adjustably secured thereto so that they can be moved to and from the cylinder.

In Fig. 13 I have shown another modification in which the foot plates 16^f are of a different shape and are provided with clamp plates and bolts and nuts for holding them in different positions on the base.

In Fig. 14 I have shown another modification in which the foot plates 16^g are pivoted at 17^g to an extended base on which is a clamp plate 19^g held by a bolt 20^g and a wing nut.

In Fig. 22 I have shown the base 2^b having integral angular extensions 16^h which form fixed foot plates. The angle of these extensions is similar to that illustrated in Figure 5 and accomplish the same purpose with the exception that they are not movable.

In Figs. 17 and 18 I have illustrated a base 2^c having slots 28 to receive removable foot plates 16^i which are shaped to enter the slots and to be on a line with the base. As clearly shown in Fig. 18, the angular arrangement of these plates is the same as illustrated in Fig. 5.

In Fig. 19 I have shown a foot plate having integral angular extensions 16^k. The foot plate is pivoted to the base 2^d at 29 so as to turn up against the front of the cylinder when not in use.

In Figs. 20 and 21 I have shown a similar construction, in which a projecting plate 30 is pivoted at 29^a to the base 2^e, and to which the foot plates 16^m are pivotally connected.

In all the figures above described the foot plates are either arranged at an angle projecting at the front of the pump or must be adjusted so that the foot plates may be arranged at an angle at the front of the pump for the purpose as above described, of holding the pump cylinder away from the body of the user and so that the base can be rigidly held by the feet of the operator in a natural position. The foot plates are made adjustable so that they can be packed in a comparatively small space.

I claim:

1. The combination of an air pump having a base; a cylinder on said base; two foot plates pivotally mounted on the base, with means whereby the foot plates are operatively geared together and are free to swing in a plane at right angles to the line of the cylinder.

2. The combination in an air pump of a

base; a cylinder on said base; two foot plates adjustably mounted on the base having intermeshing teeth whereby movement of one plate is communicated to the other, said foot plates being free to swing in a plane at right angles to the pump cylinder.

3. The combination of an air pump having a base and two foot plates pivotally mounted on the base; means whereby the two foot plates are geared together and are free to swing in a plane at right angles to the line of the cylinder; and means for locking the plates in either the closed or extended position.

4. The combination of an air pump having a base; two foot plates pivotally mounted on the base; an independent pivot for each foot plate, the two foot plates being geared together; a clamp plate, a bolt extending through the plate, and a nut on the bolt bearing against the plate to clamp the foot plates in the position in which they are adjusted.

5. The combination of an air pump having a base; two foot plates adjustably mounted on the base so as to project radially therefrom; with means for clamping said plates in an adjusted position at an angle to each other.

NICHOLAS A. PETRY.