

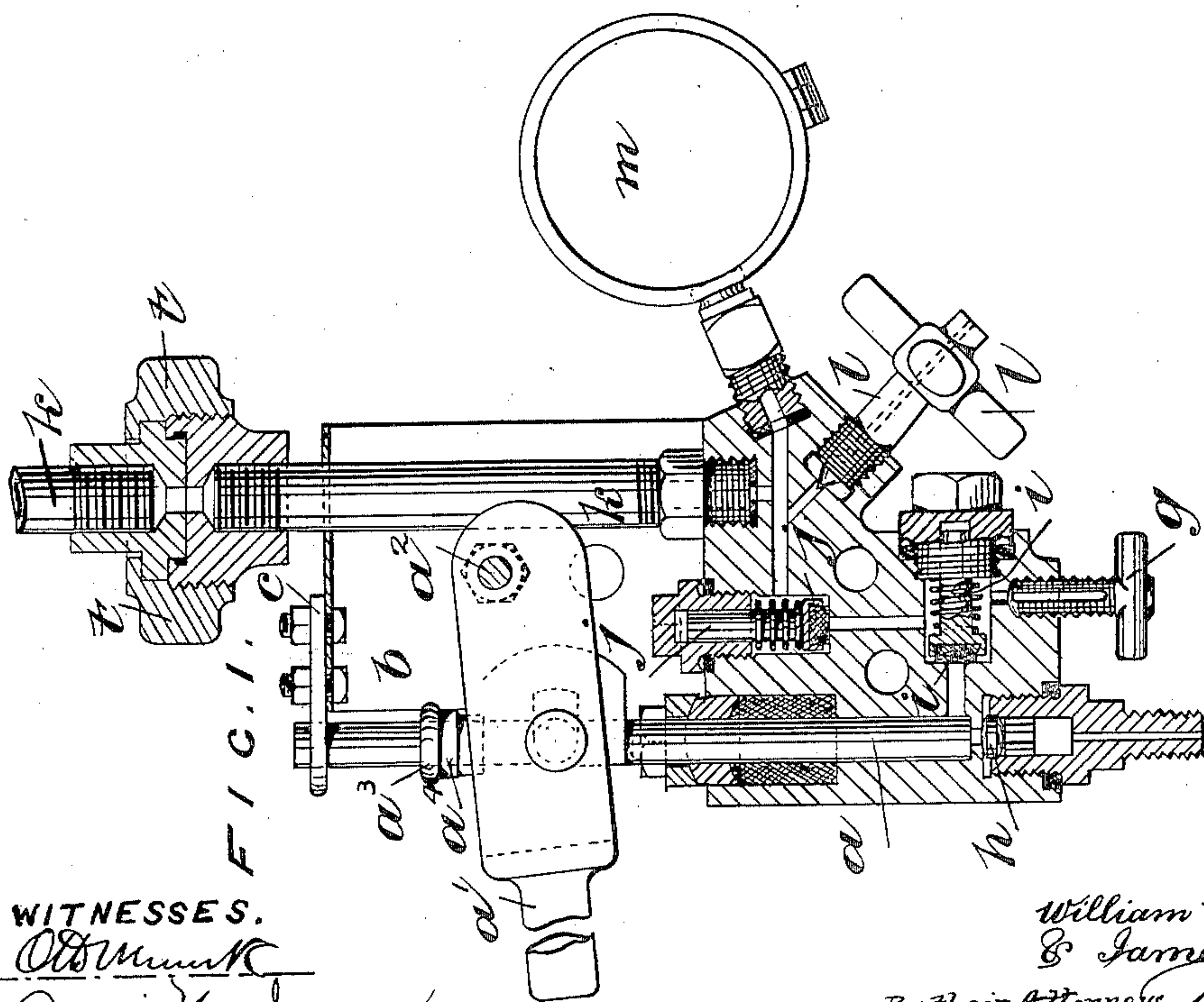
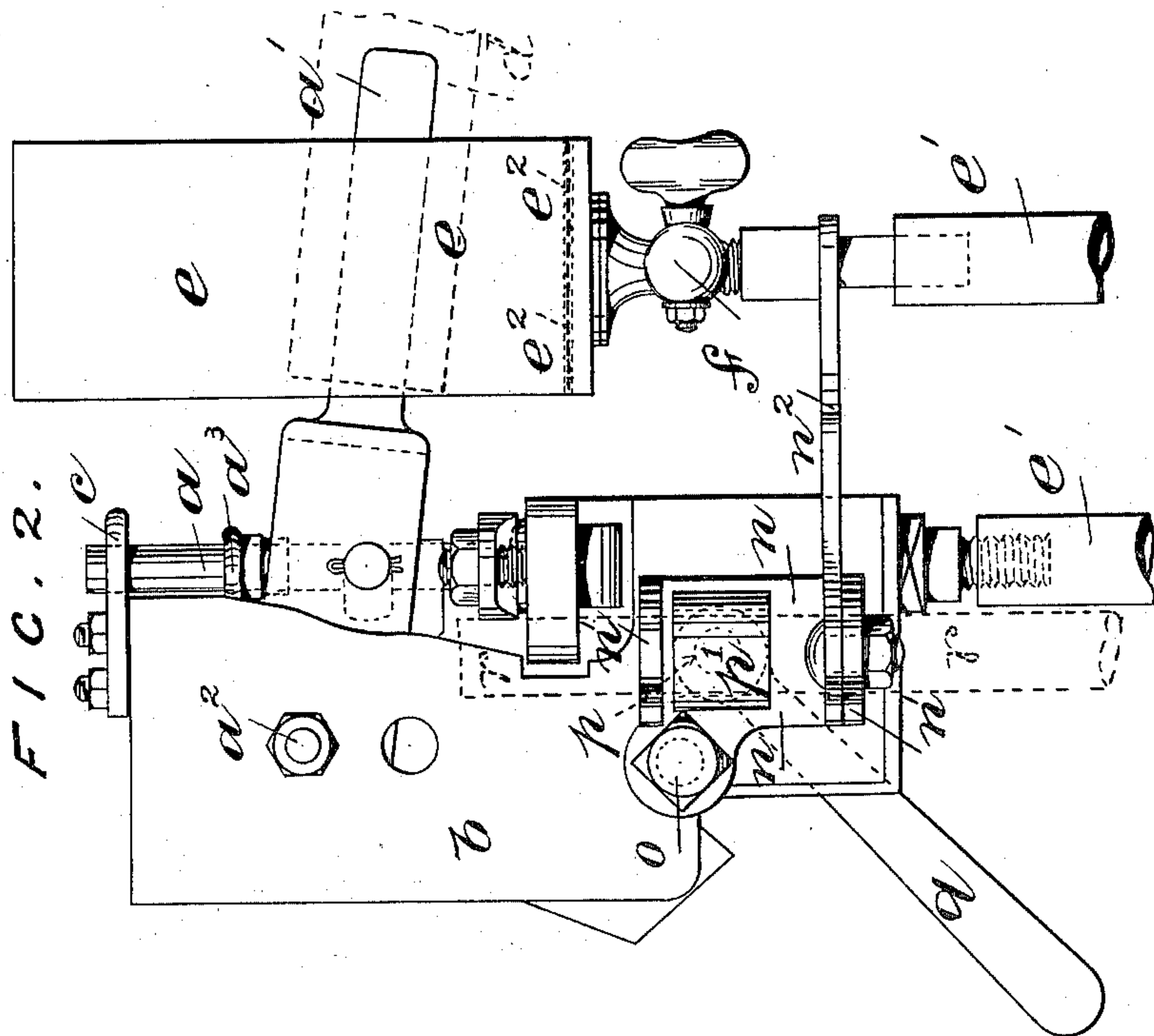
(No Model.)

2 Sheets—Sheet 1.

W. G. GASS & J. TONGE.
PORTABLE PUMP.

No. 604,579.

Patented May 24, 1898.



WITNESSES.

Oldmunk
Amie H. Isaac.

INVENTORS.

William George Gass
& James Tonge.

By their Attorneys *Richard*

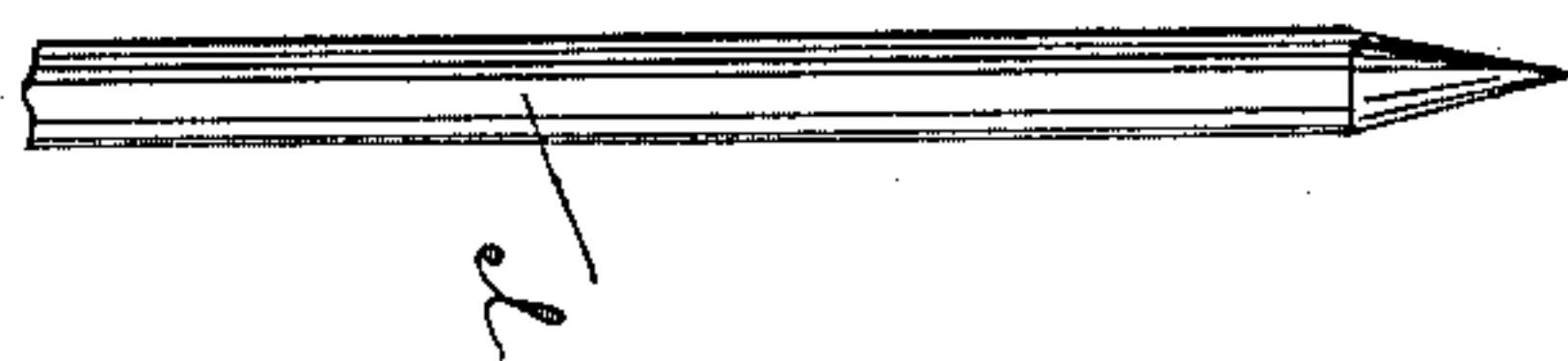
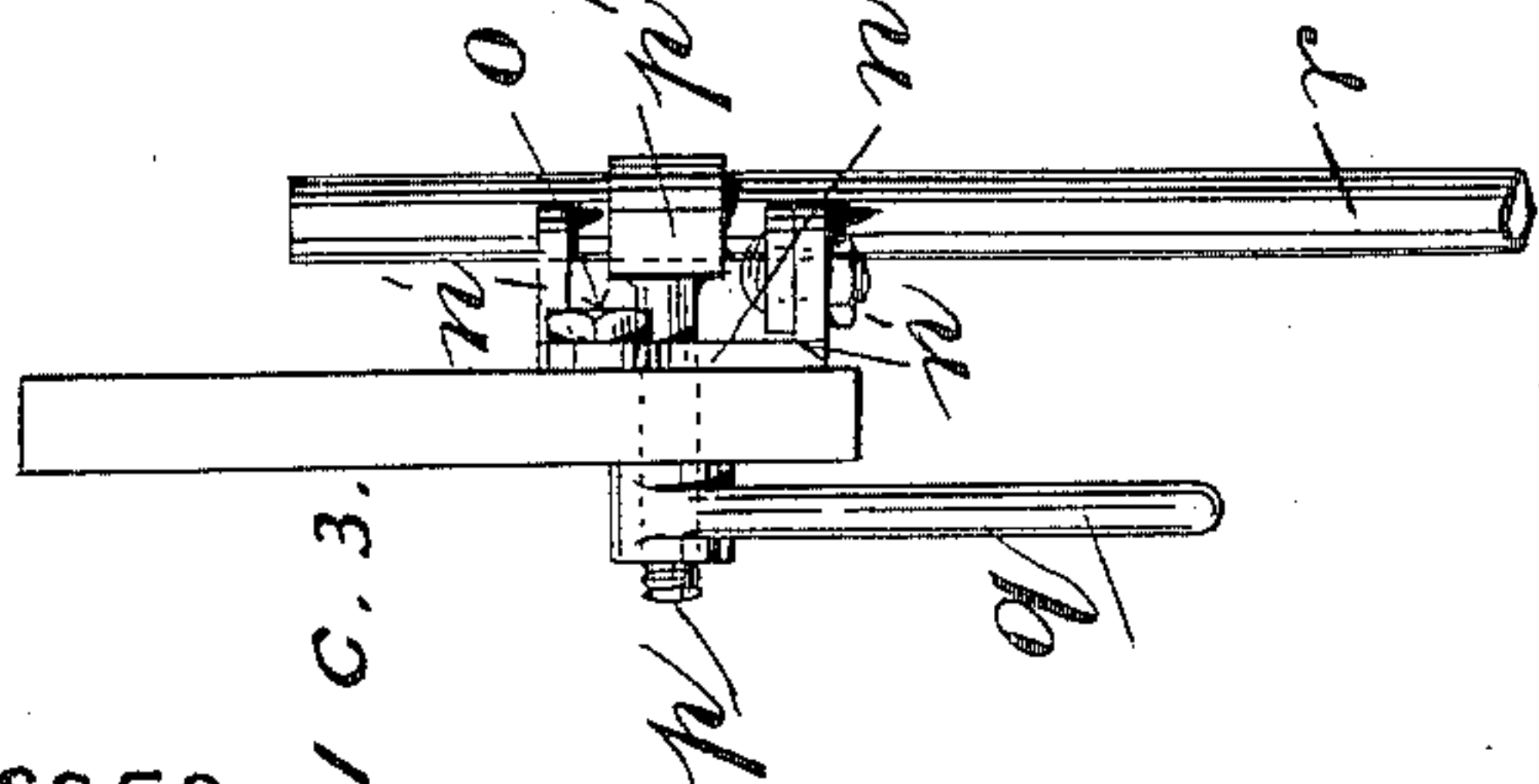
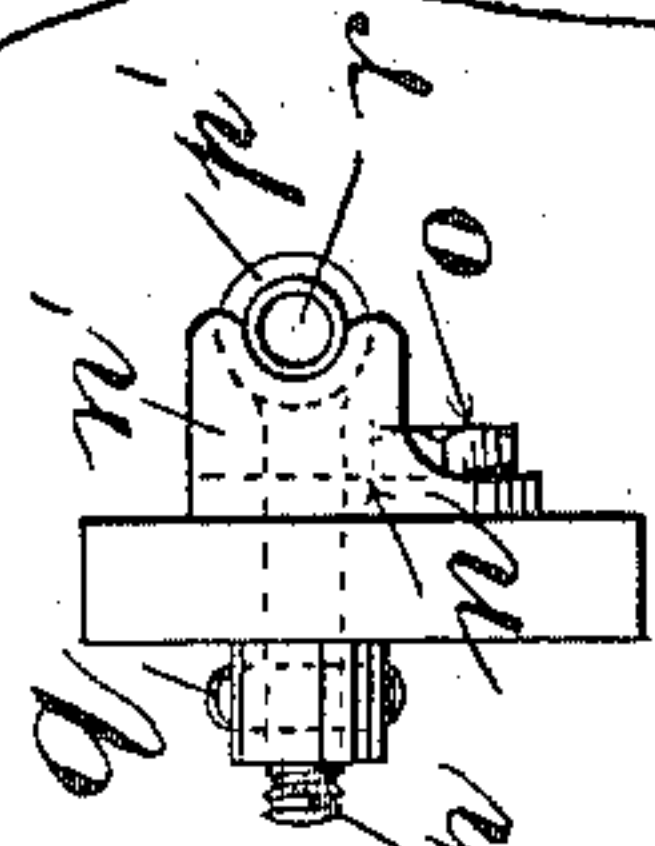
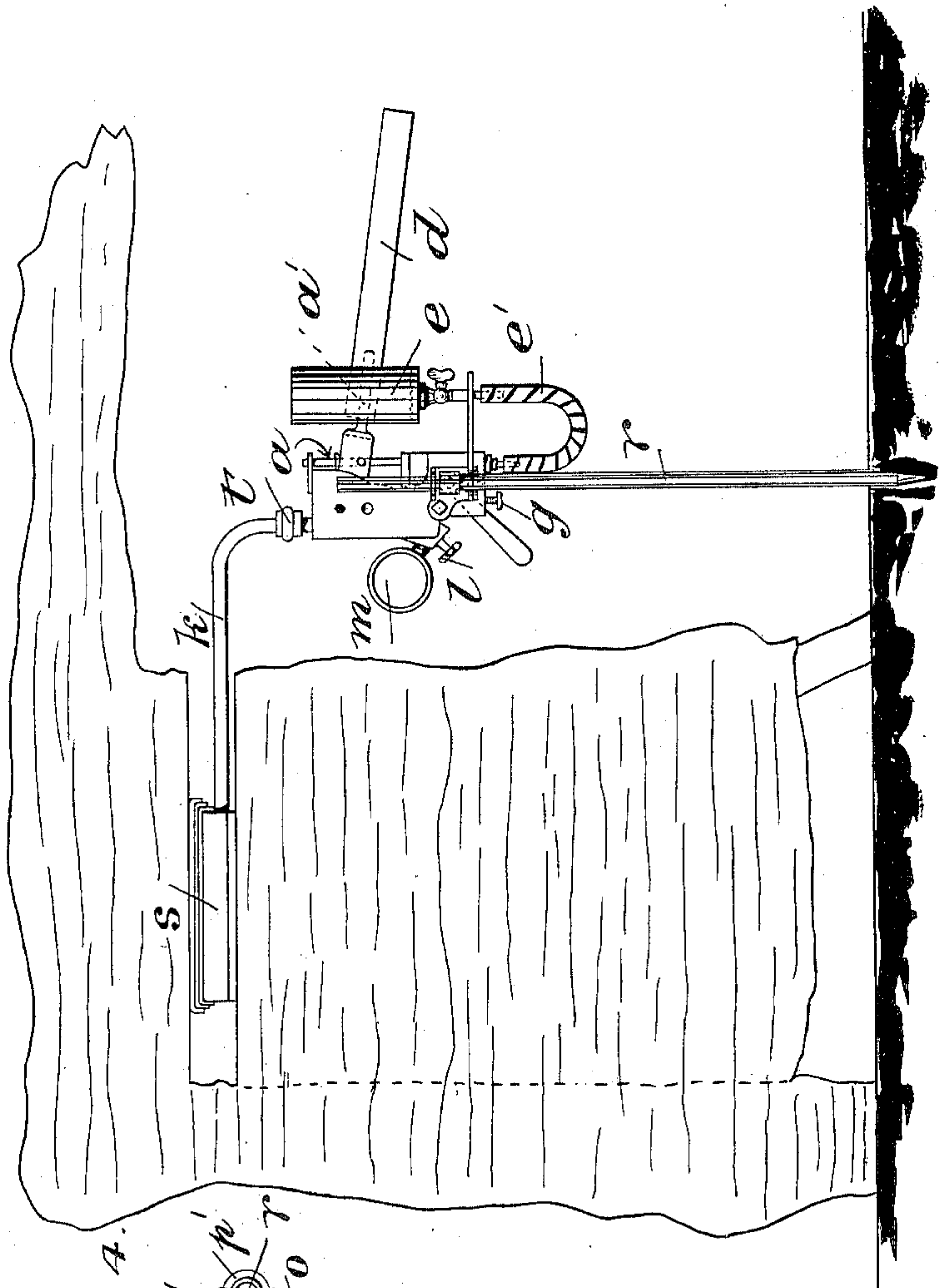
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INVENTORS.

William George Cass.
& James Fonge.
By their Attorneys Richard

UNITED STATES PATENT OFFICE.

WILLIAM GEORGE GASS AND JAMES TONGE, OF BOLTON, ENGLAND.

PORTABLE PUMP.

SPECIFICATION forming part of Letters Patent No. 604,579, dated May 24, 1898.

Application filed August 19, 1897. Serial No. 648,776. (No model.) Patented in England March 23, 1897, No. 7,441.

To all whom it may concern:

Be it known that we, WILLIAM GEORGE GASS and JAMES TONGE, subjects of the Queen of Great Britain, residing at Bolton, Lancaster county, England, have invented certain new and useful Improvements in Portable Pumps, of which the following is a specification, the invention having been patented in Great Britain, No. 7,441, March 23, 1897.

Our said invention relates to improvements in portable pumps, and is particularly applicable for use with hydraulic mining-cartridges used for breaking down coal and other minerals of the type disclosed in our former United States patent, No. 590,973, dated October 5, 1897. We have found in practice that to work this type of hydraulic cartridge successfully a portable pump of special construction is essential. To operate with success in the cramped space in the mines, the pump must be small and easily portable. It must be readily adjustable at varying heights and be capable of exerting a very high pressure.

In practice we have found that to enable a force-pump to be conveniently operated manually in the mines a plunger of small diameter—say five-eighths of an inch—only could be used. Where a plunger of larger diameter was used, the extra power required to be exerted could not be conveniently applied in the cramped space within which the apparatus is required to be used. The amount of water pumped at each stroke with a plunger of this area is very small, and if one valve only was used we found that owing to leakage of the valve it was impossible to get up the pressure to more than about fifteen hundred weight per square inch, which is totally inadequate to effect the purpose. To obviate this disadvantage, we employ a second valve, which effectually prevents leakage, and actual working pressures of from one to three tons and upward per square inch are readily obtained. Together with the duplicate valves we combine with the pump a water-reservoir, air and water relief valves, and a pressure-gage, the whole, together with means for readily adjusting the height of the pump, forming a combination highly successful in practice.

In order that our said invention may be more fully understood, we will now describe

the same with reference to the accompanying two sheets of illustrative drawings.

On Sheet 1 Figure 1 is a sectional view of the pump. Fig. 2 is an outside view showing the attached water-reservoir. On Sheet 2 Fig. 3 is a diagrammatic representation of the pump, showing how the same is adjustably secured to a standard. Fig. 4 is a plan view of Fig. 3. Fig. 5 is another diagrammatic view showing the pump in use with a hydraulic mining-cartridge.

Referring in the first place to Figs. 1 and 2, the pump-plunger *a* is operated by means of the short handle *a'*, pivoted at *a*² to the side cheeks *b*, the upper end of the plunger *a* being steadied by a guide *c*. The plunger *a* is provided with a rubber or other ring *a*³, bedding upon the collar *a*⁴, so as to deaden the impact of the collar *a*⁴ with the guide-plate *c* when the plunger *a* is raised to the top of its stroke. The handle *a'* has a loose extension *d*, which can be applied when increased leverage is required, as indicated in Fig. 5. Pressure may be quickly pumped up by means of the short handle *a'*, the extension *d* being mounted to increase the leverage when the maximum pressure is being developed.

The water is drawn from the reservoir *e* by way of the flexible pipe *e'*. The reservoir *e* is placed at a higher level than the valve, so that a slight head or pressure of water is obtained, thus obviating the necessity of pumping the water to the valves. A stop-cock *f* is provided at the foot of the reservoir to cut off the supply when desired. The reservoir *e* is provided at the bottom with a filter-grid or strainer *e*² to prevent the admission of dirt and other foreign matter to the pump-chamber.

On starting the pump the air in the pump-chamber is allowed to escape through the air-valve *g*, thus facilitating the raising of the water-pressure. The water entering through the valve *h* is forced by the downward stroke of the plunger *a* through the back-pressure valve *i*, and from thence through the back-pressure valve *j* along the tubing *k* to the hydraulic cartridge or the like. The employment of the duplicate back-pressure valves *i j* effectually prevents any leakage by back pressure, as already described, and the

necessary pressure of water is thus easily obtained. A relief-valve *l* is provided to release the pressure of water when the cartridge has broken down the coal. A pressure-gage *m* is also provided to indicate the pressure exerted.

The method of adjustably mounting the pump is as follows: A bracket *n* is bolted to the side cheek *b* of the pump, as shown in Fig. 2, by means of a bolt *o*. A bolt *p*, formed with an eye *p'*, passes through the bracket *n* and the side cheeks *b* and is formed with a screwed end engaging with a handle *q*. A standard *r* slides freely in the eye *p'* of the bolt *p* and by means of the handle *q* can be clamped firmly against the overhanging hollowed lips *n' n'*, formed on the bracket *n*. Thus the pump may be readily adjusted at varying heights upon the standard *r*. The plate or bearer *n²*, bolted to the bottom of the bracket *n*, serves to carry the reservoir *e*, as indicated in Fig. 2. The foot of the standard *r* is pointed to enable it to be easily bedded in the ground.

Fig. 5 shows the method of using our improved portable force-pump in combination with a hydraulic mining-cartridge *s*. The figure shows a section of coal undercut and "spragged" at the foot, as usual. A hole of suitable diameter having been drilled the cartridge *s*, which is connected to the pump by

the tubing *k*, which can be readily coupled and uncoupled by the coupling *t*, is placed within the hole. The pump is adjusted at the required height upon the standard *r*, the end of the standard being forced in the ground by the pressure transmitted to the pump by the handle *d*. Pressure can then be readily pumped up, first, by means of the short handle *a'*, and, finally, by the aid of the extension *d* until the mass of coal has been brought down.

What we claim as our invention is—

A pump for use in mining of a light and portable character adapted for use in confined limits, comprising the piston and cylinder, the duplicate check-valves, the standard, the reservoir, both the pump-cylinder and the reservoir being adjustable vertically of the standard, means for operating the pump by a downward thrust in the direction of the standard, and a connection extending from the pump to the cartridge from the upper part of the pump, substantially as described.

In witness whereof we have hereunto set our hands in presence of two witnesses.

WILLIAM GEORGE GASS.
JAMES TONGE.

Witnesses:

J. ENTWISLE,
R. IBBERSON.