

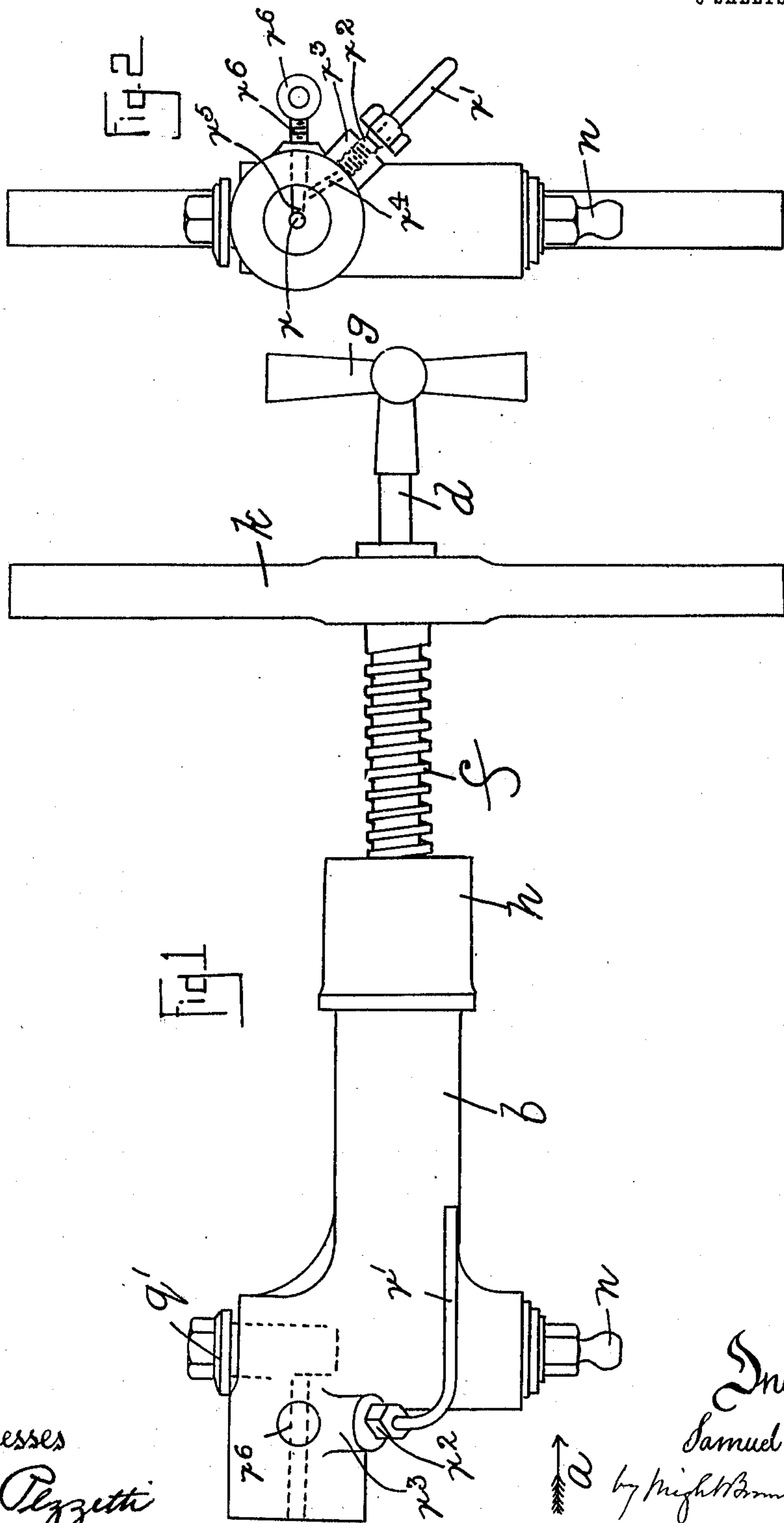
S. BARNETT.  
HAND PUMP.

APPLICATION FILED DEC. 18, 1909.

Patented Dec. 13, 1910.

3 SHEETS—SHEET 1.

978,265.



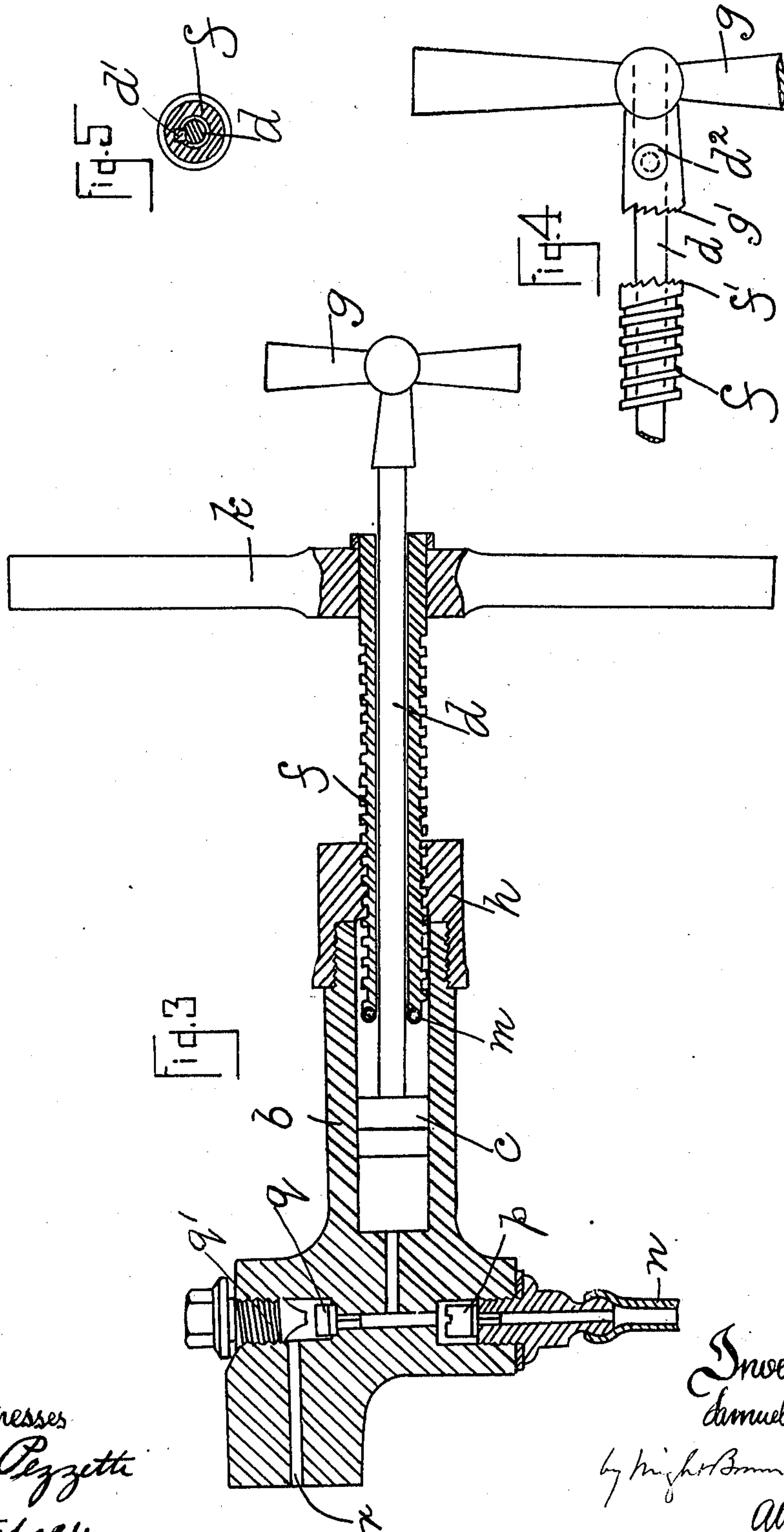
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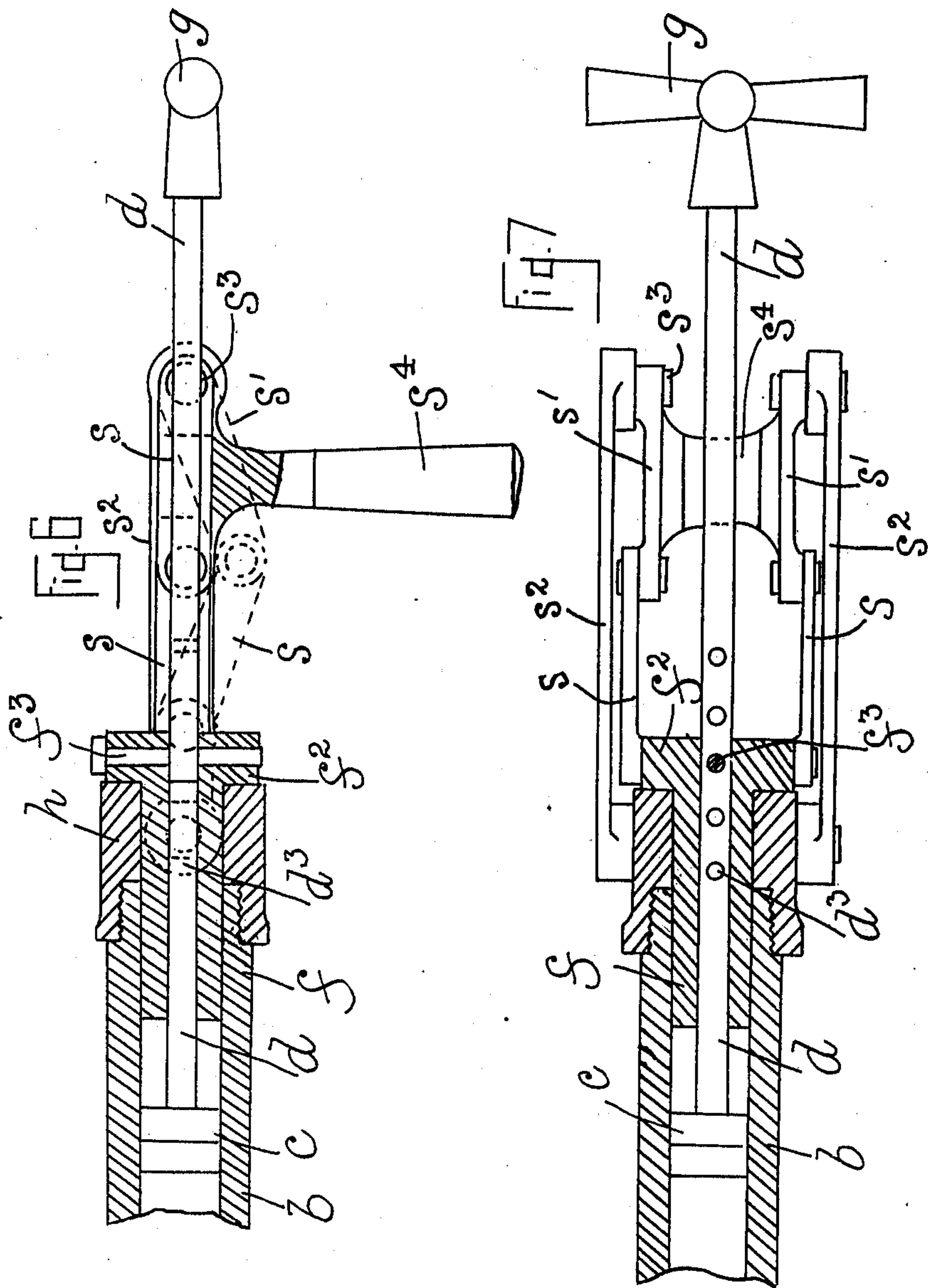
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3 SHEETS—SHEET 3

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# UNITED STATES PATENT OFFICE.

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## HAND-PUMP.

978,265.

Specification of Letters Patent.

Patented Dec. 13, 1910.

Application filed December 18, 1909. Serial No. 533,929.

*To all whom it may concern:*

Be it known that I, SAMUEL BARNETT, a subject of the King of Great Britain, and resident of Pelham street, Derby, in the county of Derby, England, have invented certain new and useful Improvements in Hand-Pumps, of which the following description, together with the accompanying sheets of drawings, is a specification.

My invention relates to hand pumps for purposes wherein the liquid or gas to be supplied or caused to circulate by such pumps is first delivered in comparatively large quantities until the pressure of such gas or liquid becomes greatly increased, thus requiring the application of greater force to cause same to flow or to be supplied as desired, as for example:—In the employment of a pump for supplying water under pressure to a hydraulic cylinder or press containing a series of rams for the purpose of breaking down coal in a coal-mine, or for performing like operations, at the commencement of the supply of water to such hydraulic press it is desirable that it be supplied in such quantities as will quickly fill up all the interstices or spaces within the several chambers for the series of rams and passages between same comparatively quickly, on which, when excessive pressure has to be exerted by such hydraulic ram, then the worker or manipulator of the pump ought to be enabled by other means to supply a less quantity of water but at a greater pressure to complete the final operations of the ram, as will be understood.

As another example:—In the inflating of the tire for a motor car wheel, until the cavity within said inflatable tire is comparatively full of air little force is required to supply said air until the last or finishing conditions are reached, at which time it is desirable that by exerting the same force a smaller quantity of air may be delivered at greater pressure thus to complete the inflation of the tire to the desired extent.

To attain these results and by devices which are comparatively light and therefore may be carried about easily and as readily put into use, is the object of this invention.

In the accompanying sheets of drawings, which are illustrative of my said invention:—Figure 1 is a side elevation of a hand pump constructed in accordance with my in-

vention. Fig. 2 is an end elevation thereof as seen in the direction indicated by the arrow *a*, Fig. 1. Fig. 3 is a sectional side elevation of said pump. Fig. 4 is a side elevation of the piston rods and their operating handle, and shows a modification in the construction of these parts. Fig. 5 is a cross section of the piston rods and shows a further modification in the devices for operating them. Fig. 6 is a sectional side elevation showing a modified form of my improved pump. Fig. 7 is a sectional plan of parts shown by Fig. 6.

The accompanying sheets of drawings illustrate a pump for use in supplying water to what is known as a hydraulic mining cartridge, but from these drawings and from the following description it will readily be understood how my invention may be applied to other forms of hydraulic or pneumatic pumps.

In carrying my invention into effect I make use of a pump cylinder *b* in which is arranged a piston *c* the piston rod *d* of which passes through the supplementary or hollow rod or piston sleeve *f* to receive beyond the latter an appropriate handle *g* for operating said piston *c* within the cylinder *b*. By these means the piston *c* may be comparatively quickly reciprocated by the user laying hold of the handle *g* and moving said piston *c* by its rod *d* until the desired quantity of gas or liquid has been supplied or until the pressure to be exerted over said rod *d* is beyond the power of the user, on which the supplementary piston sleeve *f* may be brought into use to carry out or finish the supplying of the gas or liquid as desired. The supplementary piston sleeve *f* is arranged to be caused to advance by same being screwed through or into bearings *h* fixed upon the cylinder *b* in order that as said sleeve or hollow rod *f* is rotated it may also be caused to advance. The said piston sleeve *f* is provided with the handle *k* by means of which it may be rotated, while it is or may be provided with anti-friction ball or thrust bearings *m* which intervene between same and the piston *c* so that as said sleeve *f* is rotated its end will merely rotate against and advance the said piston *c* without the latter being rotated. In the pump described the liquid is supplied through the inlet pipe *n* and inlet valve *p* and is forced out past the outlet valve *q* through the out-



let pipe  $r$ , the latter being connected to the hydraulic mining cartridge or other part where the liquid is required to exert its pressure. The movement of the outlet valve  $q$  is regulated by the adjustable plug  $q^1$ . In order to liberate the pressure of the liquid at any time a pipe  $r^1$  is held by means of the screwed plug  $r^2$  within an opening in the projecting part  $r^3$  of the cylinder  $b$ , a passage  $r^4$  leading from the end of said pipe to the passage  $r^5$  which communicates with the outlet opening  $r$ . A screw  $r^6$  normally closes the end of the opening  $r^4$ , and the unscrewing of said screw  $r^6$  allows water to escape by means of the pipe  $r^1$  whenever desired.

Instead of employing two handles  $g$  and  $h$  as above described, we may dispense with the handle  $h$  and form upon the piston rod  $d$  a key or feather  $d^1$  which fits within a correspondingly shaped groove within the hollow piston rod or sleeve  $f$  by which means the piston rod  $d$  may be reciprocated as desired without moving the sleeve  $f$ , while the rotary movement of said rod  $d$  will also rotate the sleeve  $f$  to move it longitudinally whenever necessary. Or the handle  $g$  may be connected to the rod  $d$  as by the pin  $d^2$  and may be detached therefrom by the removal of such pin and slid along said rod  $d$  so that the clutch part  $g^1$  thereon may engage with the clutch part  $f^1$  on the hollow piston rod or sleeve  $f$ . Thus by this detachable handle  $g$  both of the rods  $d$  and  $f$  may be actuated one at one time and the other at another time.

Instead of making use of a screw thread upon the hollow piston rod or sleeve  $f$  I may connect this latter to toggle levers  $s$  and  $s^1$  which are mounted or supported upon the brackets  $s^2$  the fulcrum of such toggle lever device being at  $s^3$ . The part  $f^2$  of the hollow piston rod or sleeve  $f$  may be connected to the rod  $d$  whenever desired by the pin  $f^3$  passing through one or another of the openings  $d^3$  in said rod  $d$ , by which means the piston  $c$  may be operated by its rod  $d$  and handle  $g$  as above described and when the extent of the pressure exerted thereby has reached its limit this rod  $d$  may be connected to the sleeve  $f$  and the powerful

toggle lever device then brought into action it being operated by means of its handle part  $s^4$  to complete the pumping operations and obtain the requisite additional amount of pressure.

Such being the nature and object of my said invention, what I claim is:—

1. In a hand pump, a cylinder, a piston sleeve extending into said cylinder, a piston rod extending through the sleeve and having a piston at its inner end, said rod being freely and manually movable for preliminary operation, and means to cause the sleeve subsequently to actuate the piston.

2. In a hand pump, a cylinder, a piston operating within such cylinder, a piston-rod secured to said piston, a screwed sleeve through which the piston-rod takes, a nut for meshing with said screwed sleeve, and a handle for operating same, substantially as specified.

3. In a hand pump, a cylinder, a piston operating within said cylinder, a rod secured to said piston, having a handle or means whereby its motion may be transmitted to said piston, a screwed sleeve through which said rod takes, a nut meshing with said screwed sleeve a handle for operating said screwed sleeve so that it may be brought to press upon the piston within said cylinder, and valves arranged to operate in conjunction with said cylinder, substantially as herein specified.

4. In a hand pump, a cylinder, a piston operating within said cylinder, a rod secured to said piston, having a handle or means whereby its motion may be transmitted to said piston, a screwed sleeve through which said rod takes, a nut meshing with said screwed sleeve a handle for operating said screwed sleeve so that it may be brought to press upon the piston within said cylinder, and ball bearings to intervene between the end of the screwed sleeve and the piston, in combination.

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

SAMUEL BARNETT.

Witnesses:

JAMES TONGE,  
JOHN WHITEHEAD.