

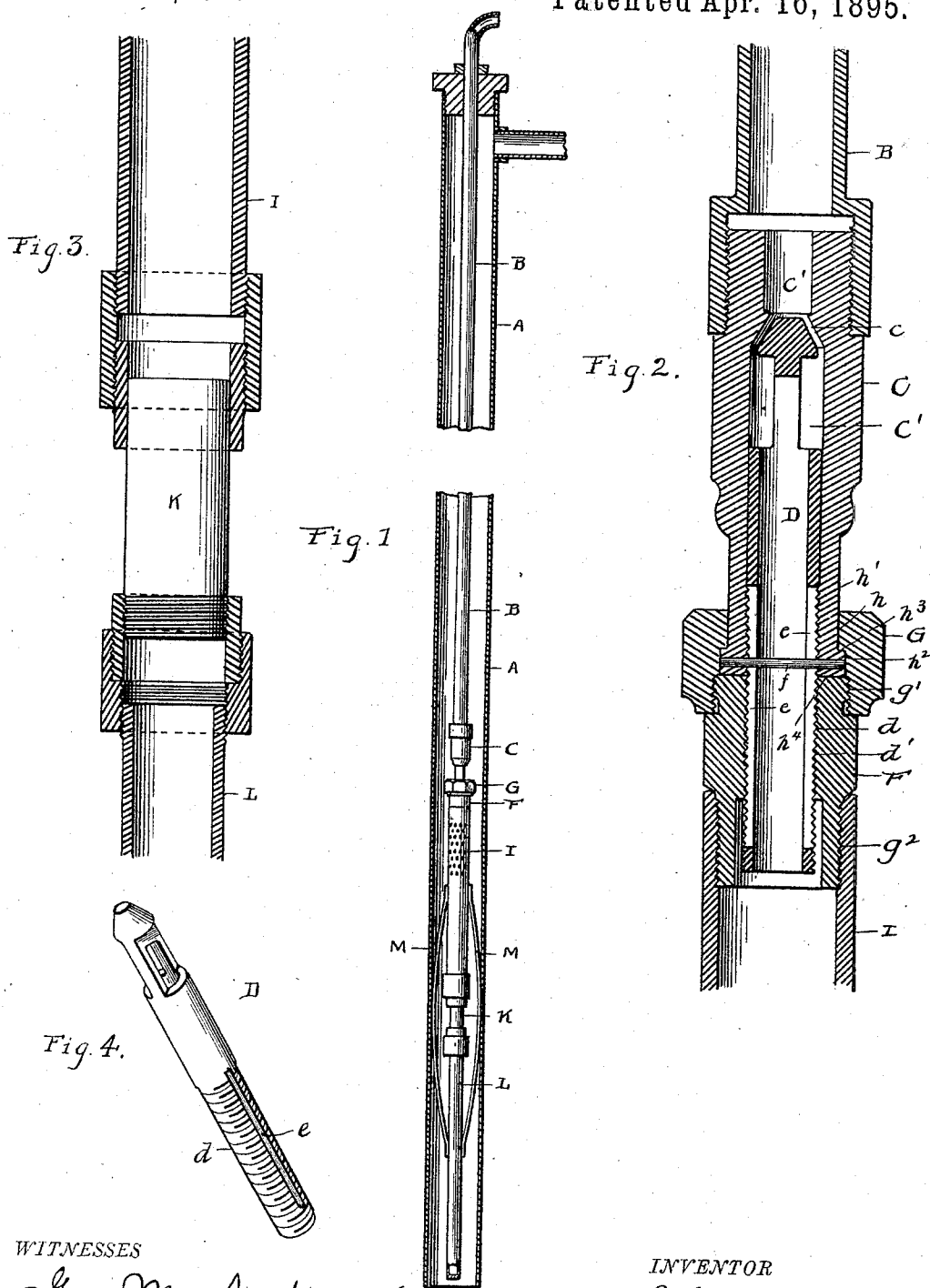
(No Model.)

P. G. DECKER.

MEANS FOR SEPARATING GAS AND WATER OR GAS AND OIL.

No. 537,758.

Patented Apr. 16, 1895.



WITNESSES

Geo. M. Anderson
Philip C. Mass.

INVENTOR

P. G. Decker
by E. W. Anderson
his Attorney

UNITED STATES PATENT OFFICE.

PHILIP G. DECKER, OF ANDERSON, INDIANA.

MEANS FOR SEPARATING GAS AND WATER OR GAS AND OIL.

SPECIFICATION forming part of Letters Patent No. 537,758, dated April 16, 1895.

Application filed January 11, 1895. Serial No. 534,550. (No model.)

To all whom it may concern:

Be it known that I, PHILIP G. DECKER, a citizen of the United States, and a resident of Anderson, in the county of Madison and State of Indiana, have invented certain new and useful Improvements in Means for Separating Gas and Water or Gas and Oil; and I do declare the following to be a full, clear, and exact description of the invention, such as will enable others skilled in the art to which it appertains to make and use the same, reference being had to the accompanying drawings, and to letters of reference marked thereon, which form a part of this specification.

Figure 1 of the drawings is a representation of a vertical section of the invention with part broken away in middle. Fig. 2 is a sectional view showing the operation of the valve. Fig. 3 is a sectional view showing the arrangement for permitting a sliding movement of nipple K. Fig. 4 is a perspective view of the valve.

This invention has relation to means for effecting the separation of gas and water, or gas and oil in natural gas wells, the object being to get rid of such water or oil and thereby keep the pressure of the gas to the point or nearly to the point at which it would naturally be in the absence of such water or oil.

With this object in view the invention consists in the novel construction and combination of parts, all as hereinafter described, and pointed out in the appended claims.

Referring to the accompanying drawings, the letter A designates the gas pipe, which extends the full depth of the well in the usual manner and in which the gas is collected and carried to the surface. This pipe is usually from two to three inches in diameter. Within this pipe I place a smaller pipe B, which is usually from one-half inch to one inch in diameter, and which extends from the surface to a point near the lower end of the pipe A. The lower end of the pipe B is threaded onto the upper portion of a section C of a regulator or valve. The interior chamber C' of said section C is provided at its upper end with a valve seat c, above which the passage c' through the section, is of reduced diameter.

D designates a valve which consists of an elongated, hollow plug which fits loosely in

the chamber C, its upper end being of conical form to fit the seat c and close the passage c'. The lower portion of said plug for about one-half its length is formed with an external thread d, and through this threaded portion is formed a longitudinal slot e, which intersects the chamber of the plug, and extends through both sides thereof, the lower end of the slot extending to within a short distance of the lower end of the plug. That portion of the plug which forms the valve is solid, lateral openings E being provided just below the valve for the escape of the oil or water which enters the plug at the lower end. The plug is connected to the section C by means of a pin f which extends through the lower portion of said section and through the slots e. By means of this pin, the section C and the plug D are caused to rotate together, while the section is permitted to slide on the plug.

F designates a nipple, which is provided with an interior thread d' to fit the thread d of the plug, and whose end portions are fitted respectively with exterior threads g', g². This nipple is designed to screw upon the plug against the lower end of the section C, and its thread g' receives the thread of a nut G. This nut G, above its thread has a smooth bore h, which is fitted neatly but slidably on a smooth portion h' of the section c, and is prevented from coming off the lower end of said section by means of a collar h² on the latter, and the offset h³ in the bore of the nut. When the parts are together, the nut G screws down against a shoulder h⁴ of the nipple F and covers the joint.

The thread g² of the nipple F receives the thread of a pipe I, which is open at its lower end to receive a nipple K, which fits the interior of the pipe I neatly to prevent leakage, but which is capable of a sliding movement therein. Connected to said nipple K is a pipe L, which extends to the bottom of the well and which is closed at its lower portion. The pipe I has therein a series of perforations, through which the water is admitted.

M, M, designate springs of laterally bowed form, which are rigidly secured at one end to the pipe L and at the other end to the pipe I. The tendency of these springs is to raise the

pipe I upon the nipple K, but owing to the weight of the pipe B which is borne by the pipe I, this tendency is overcome and the said springs are bowed against the inner wall of the gas pipe A, with which they bind sufficiently to prevent the nipple F, pipes I, L, and nipple K from turning upon the section C.

The pipe B being rigidly secured to the section C, when said pipe is turned at the surface, the section C will also be rotated in the nut G, rotating also the plug D. As the pipe B and section C are rotated in one direction (to the left in the arrangement shown, the valve being supposed as open), the plug D rises on the thread of the nipple F, while the section C remains in contact with the nipple F, owing to the pin *f* riding in the slot of the plug. As said plug rises, it contacts with the seat *c* and closes the passage *c'*. Upon the opposite rotation of pipe B, and section C, the plug D is carried away from its seat and the passage *c'* is opened. By turning the pipe B at the surface, therefore, said valve may be opened or closed at pleasure. When the valve is open, the pressure of the gas in the pipe A forces the oil or water which may be in the well, into the pipe I, thence up through the valve and into pipe B, from which it is discharged at the surface. Said valve may be kept open continually to discharge the water or oil as fast as it enters the well, or it may be opened at intervals and kept open until pure gas flows from the pipe B, when it is closed and the gas confined to the pipe A.

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

1. The combination of the pipe B, the sec-

tion C screwed upon the lower portion thereof, the valve in said section, and connected thereto to rotate therewith, but capable of an independent vertical movement, the nipple in which said valve is threaded, the inlet sections attached to said nipple and means whereby said nipple and inlet sections are held from rotation, substantially as specified.

2. In a gas and water, or gas and oil separator, the regulator or valve, comprising the section C, adapted for connection with the discharge pipe, the hollow valve plug D, whose upper end portion constitutes a valve adapted to seat within the chamber of said section and close the discharge thereof, and whose lower portion is threaded and longitudinally slotted, the pin passing through the section and through said slot, the nipple F threaded internally to receive said plug, and the nut G loosely seated on said section and threaded on said nipple, substantially as specified.

3. The combination of the pipes A and B, the section C, the valve plug D, the nipple F, the nut G, the pipe I attached to said nipple, the nipple K slidably received into the lower portion of the pipe I, the pipe L connected to the nipple K, and the springs attached to the pipe L and to the pipe I, and adapted to bind against the inner wall of the pipe A, all substantially as and for the purpose described.

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

PHILIP G. DECKER.

Witnesses:

SAMUEL P. MOORE,
F. M. REED.