Jan. 29, 1929. 1,700,325

P. H. MACK

GAS CONTROL ATTACHMENT FOR PACKERS

Filed Sept. 24, 1924

Fig. 1

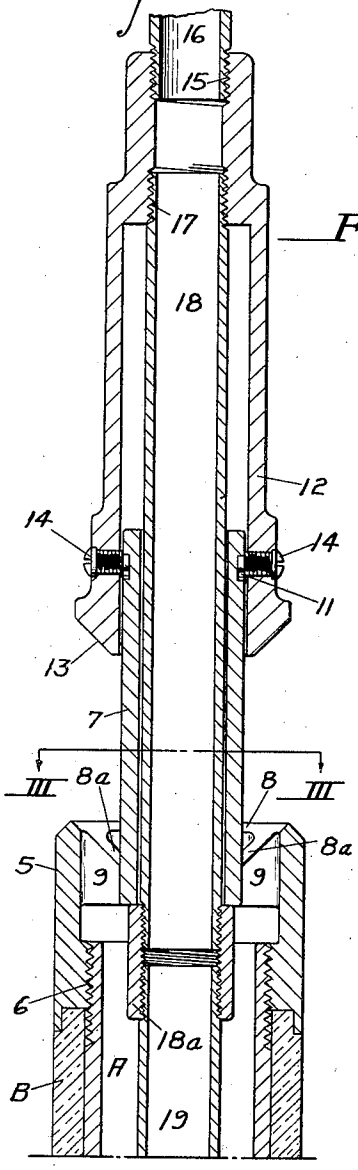


Fig. 3

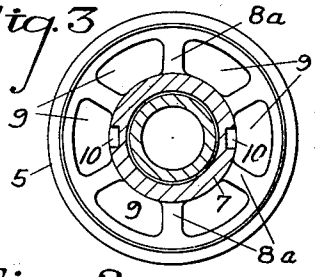


Fig. 2

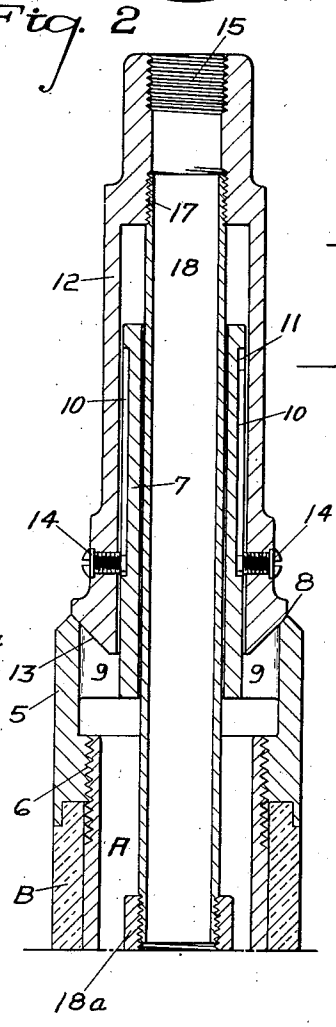


Fig. 5

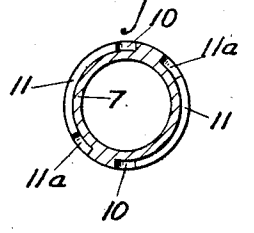
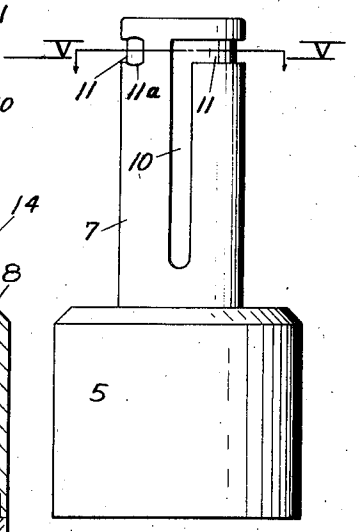


Fig. 4



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UNITED STATES PATENT OFFICE.

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GAS-CONTROL ATTACHMENT FOR PACKERS.

Application filed September 24, 1924. Serial No. 739,739.

This invention relates to well packers of the type used in oil and gas wells, and particularly to an attachment for the top of said packers.

This invention is for an improvement in a somewhat similar device described in my copending application Serial No. 689,305, filed January 29, 1924, and has for its object to provide an attachment for the top of packers which may be applied to specially formed packers, or to present types, and wherein means is provided for permitting or shutting off a flow of gas through the packer. More particularly, it has for its object to provide an improvement over the construction shown in my said application, by means of which the use of springs is eliminated.

The invention may be readily understood by reference to the accompanying drawings, in which:

Fig. 1 is a longitudinal section showing the attachment secured to the upper portion of a packer, with the gas control valve open;

Fig. 2 is a similar view, showing the valve closed;

Fig. 3 is a transverse section in the plane of line III—III of Fig. 1;

Fig. 4 is an elevation of the lower piece of the attachment, with the valve removed; and

Fig. 5 is a transverse section in the plane of line V—V of Fig. 4.

In the drawings, 5 designates the body of the control head, particularly the lower connecting portion thereof adapted to screw onto the top of the packer A, the cooperating threaded portions being designated 6. This body is substituted for the usual upper end member of a standard packer, and may, when desired, be screwed further down on the body of the packer, to compress the usual packing sleeve B. The body has a neck portion 7 of reduced diameter, and in the inwardly sloping shoulder 8, between part 5 and the neck, are ports 9. These ports are made of the greatest possible area to provide as little resistance to the flow of gas as possible, parts 5 and 7 being joined only by narrow webs 8^a.

In the neck 7 are longitudinally extending grooves 10 whose upper ends terminate in other slots 11 transverse thereto and extending partway around the periphery of the neck. The terminals of these transverse or lateral grooves are preferably slightly sunken or notched, as indicated at 11^a.

Slidably fitted or telescoping over the neck 7 is a valve member 12 having a tapered lower end portion 13 for cooperation with the sloping shoulder 8. Passing through this member 12, a little above its lowermost end, are radial pins or screws 14, whose inner ends project into grooves 10, providing a splined connection, by means of which the valve and connector are slidably but non-rotatably joined where the pins are engaged in such slots. When the member 12 is elevated until pins 14 are at the upper ends of the slots, the member 12 may be rotated a limited distance with respect to the body by reason of the lateral slots 11. The screws preferably have enlarged heads to prevent them from being turned into binding relation with the slots.

At the upper end of the sleeve or valve portion 12 is a reduced joint portion, interiorly threaded at 15, to engage a letting-in pipe 16. The upper part of member 12 is also interiorly threaded at 17 to receive the upper end of a section of well tubing 18. Section 18 is preferably a short section, carrying a coupling sleeve 18^a at its lower end, to which the next section, such as 19, of the well tubing is connected.

One important advantage of the provision of this coupling on a short length of tubing is that it provides a stop to limit the upward movement of the valve sleeve, as shown in Fig. 1, so that the weight of the packer is put on the coupling and not on the pins 14.

In use, the attachment is placed on the packer in place of the usual letting-in connection. Letting-in pipe 16 is then connected to the attachment, as shown in Fig. 1, and the packer lowered into the hole. Before being lowered, the valve is fixed in open position with the pins 14 engaged in the enlarged terminal portions 11^a of lateral grooves 11. This positively holds the valve open, even though the packer is being lowered against a flow of gas which would otherwise be sufficient to overcome the suspended weight of the packer. By reason of the enlarged terminal portions 11^a of slots 11, the tendency of the packer and body to rotate with respect to the valve member is largely overcome, either when the packer is being lowered against heavy pressure and is being urged upwardly, or when it is being lowered against low pressure and the weight of the packer is hanging from the valve member.

Once the packer has been set, the valve may

be opened or closed, as desired, to control the flow of gas past the packer.

The construction of the device as illustrated is cheap and simple. It provides a large gas escape passage, and is not dependent upon springs to hold the cooperating valve sleeve and valve body in open position. Various detail changes may, however, obviously be made in the construction of the device within the spirit of the invention.

I claim as my invention:

A gas control head for packers comprising a ported body having an upwardly projecting tubular extension thereon, said extension having a longitudinally extending groove and a lateral groove therein, said lateral groove leading out of the top of the longitudinally extending groove and extending partway around the extension, the terminal of said laterally extending groove being enlarged, a valve member surrounding and telescopingly engaging the extension, and a pin on said valve member adapted to be entered in the said lateral groove to hold the valve member against longitudinal movement on the upwardly projecting extension of the head when the valve is in one position thereon and adapted to be entered in the longitudinally extending groove to prevent relative rotative movement of the said valve member and the said extension.

In testimony whereof I affix my signature.

PATRICK H. MACK.