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L. DURKEE & G. WALTER.
OIL AND WATER WELL VALVE.

APPLICATION FILED NOV. 9, 1906.

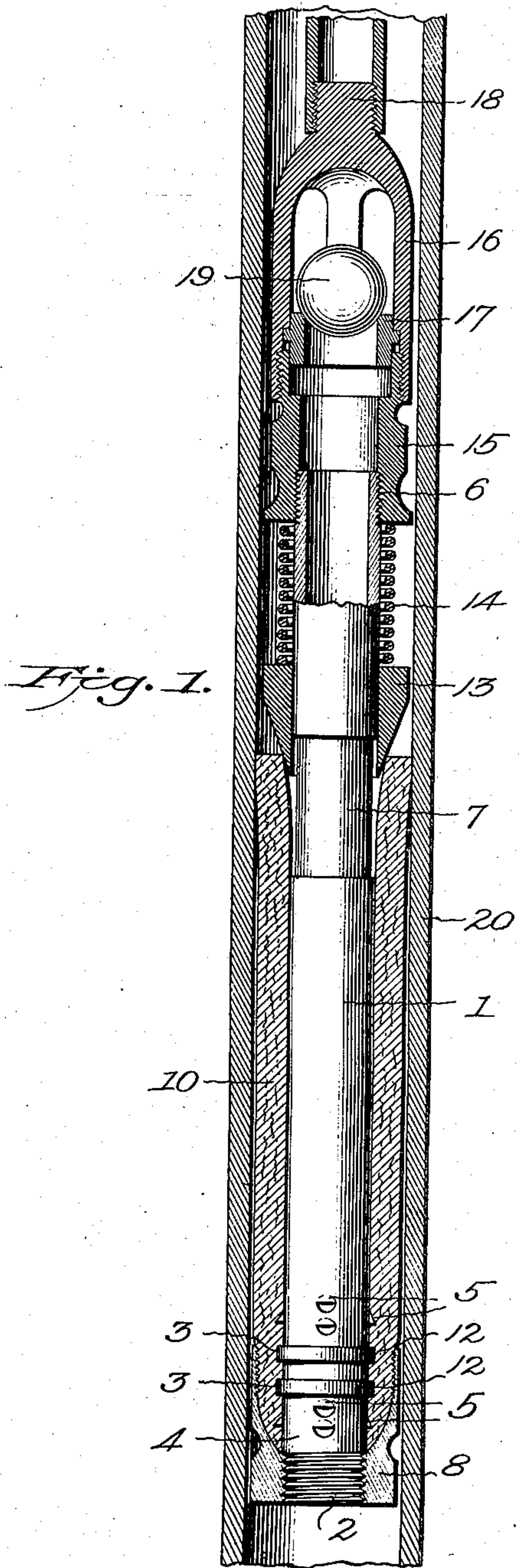


Fig. 2.

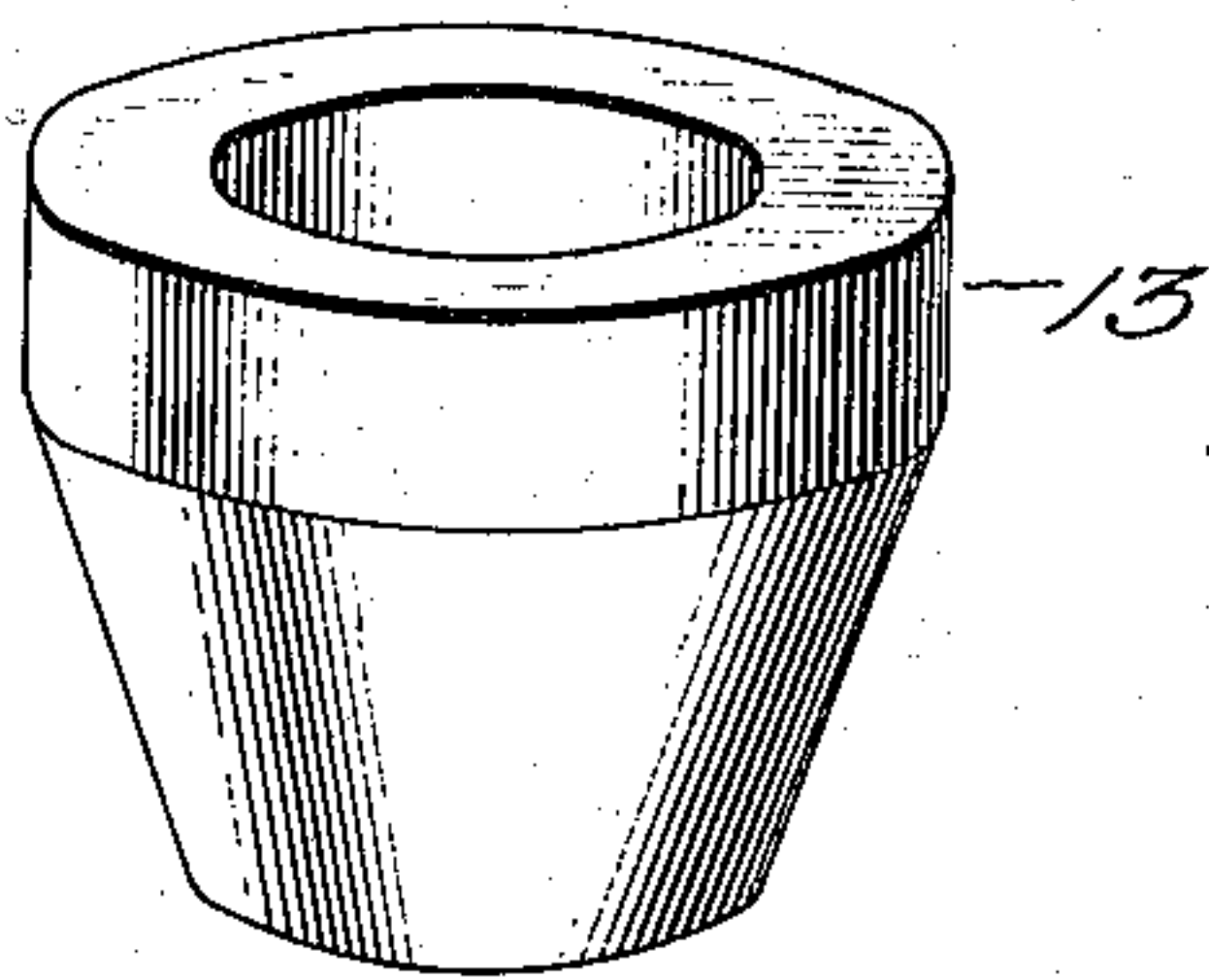
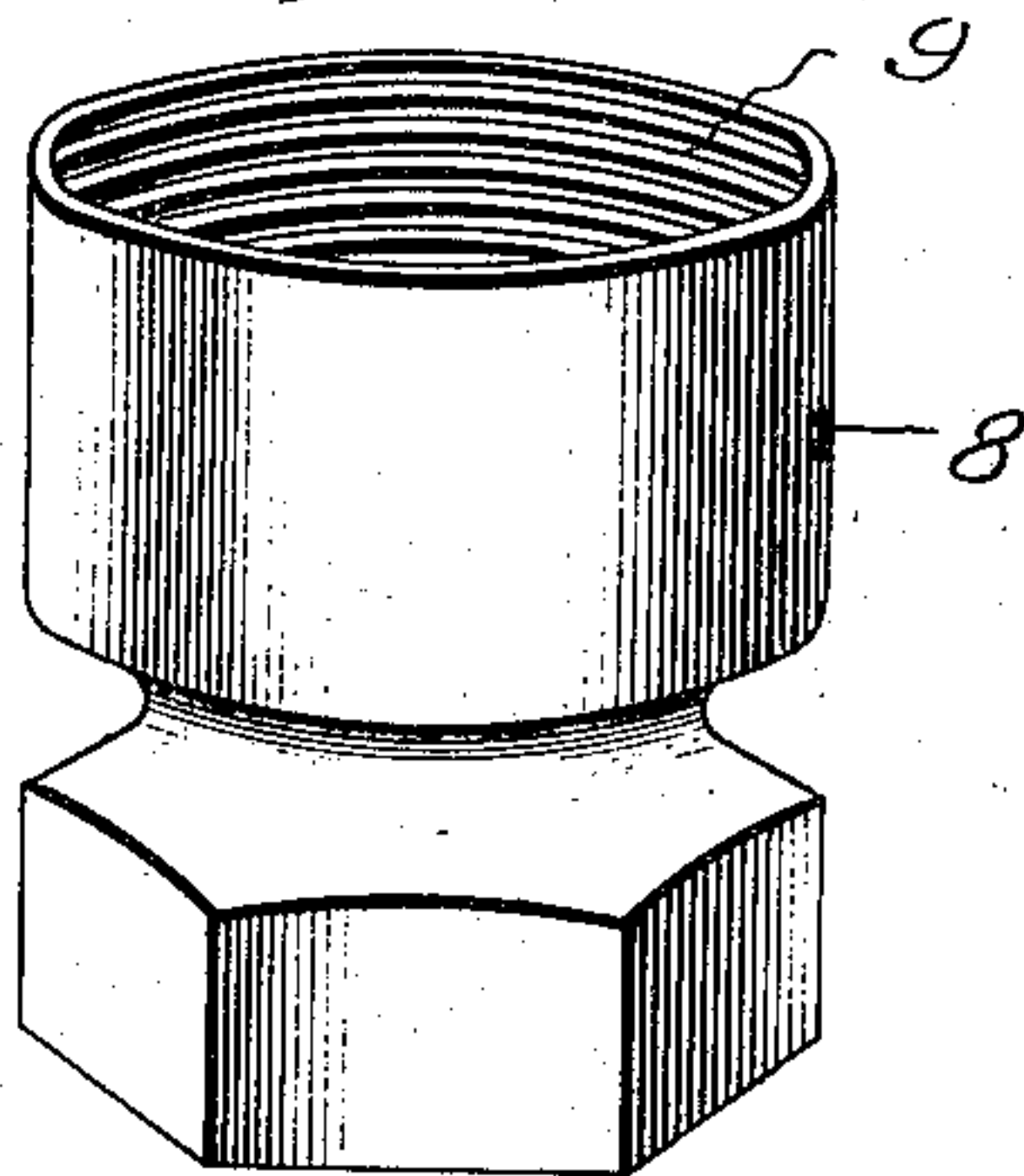


Fig. 3.



Witnesses

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UNITED STATES PATENT OFFICE.

LAFAYETTE DURKEE AND GEORGE WALTER, OF LOS ANGELES, CALIFORNIA.

OIL AND WATER WELL VALVE.

No. 858,647.

Specification of Letters Patent.

Patented July 2, 1907.

Application filed November 9, 1906. Serial No. 342,685.

To all whom it may concern:

Be it known that we, LAFAYETTE DURKEE and GEORGE WALTER, citizens of the United States of America, residing at Los Angeles, county of Los Angeles, and State of California, have invented a new and useful Oil and Water Well Valve, of which the following is a specification.

Our invention relates to improvements in valves for oil well pumps, and the objects of our invention are: First, to provide an adjustable packing valve for the valve barrels of oil wells, that is simple in construction, durable, easily manipulated to tighten the packing. Second, to provide a resiliently yielding tubular valve packing for the valves of oil well working barrels. And third, to provide an automatically expanding and contracting valve.

We attain these objects by the mechanism illustrated in the accompanying drawings, in which:

Figure 1, is a central section of our improved valve. Fig. 2, is a perspective view of the conical collar, which is spring pressed to expand the upper end of the resilient tubular packing. And Fig. 3, is a perspective view of the cupped nut, which secures the lower end of the resilient tubular packing to the valve tube. Similar letters of reference refer to similar parts throughout the several views.

Referring to the drawings, the numeral 1, designates the center tube of the valve, the lower end, 2, of which is threaded. This lower end is also provided with a plurality of projecting circumferential collars 3, two being preferably illustrated, which are positioned at a short distance from the threaded end of the center tube, and also at a short distance apart, and between the inner end of the threads and the nearest collar, a reduced neck portion 4 is formed. The outside surface of the center tube adjacent to the projecting collars is provided with a plurality of spurs 5, which are preferably formed by swaging up small portions of the metal surface of the tube. On the opposite end of the center tube, a thread 6, is also formed, and at a short distance from the inner end of this thread a short reduced portion 7, is formed in the tube. A nut 8, is threaded to the end 2, of the center tube, and this nut is provided with a cup-shaped extension in which a concave recess 9 is formed, the entrance of which is threaded. This concave recess extends into the nut to the lower end of the reduced neck portion 4. A resiliently yielding packing 10, which preferably consists of a packing in tubular form, and also preferably consists of a tubular piece of rubber, such as a piece of a rubber hose, although any other suitable material may be used if desired, is fitted tightly over the tube 1, and at its lower end it is formed with a curved taper to fit within the concave recess of the nut 8, and within this end of the hose circumferential recesses 12, are formed, in positions to fit over the collars 3, and allow the tapering end of the hose pack-

ing to extend into and to the outer end of the reduced neck portion of the tube. This packing tube extends along the center tube 1, of the valve to and over the greater portion of the reduced portion 7, of the center tube, and along its length to its opposite end from the cupped nut, by which it is rigidly clamped to the center tube, it is free, and an adjustable conical abutment collar 13 is slidably mounted on the center tube 1, and its tapering end extends into the center aperture of the hose, the end of which is beveled to receive the tapering end of the conical end of the nut. The opposite end of this adjustable collar is provided with a square shoulder, and a coiled expansive spring 14 is loosely mounted on the center tube 1, and bears at one end against the end of the conical collar. The opposite end of this expansive spring abuts against one end of a nut 15, the opposite end of which is threaded to connect the threaded end of a valve cage 16. The valve connecting end of this nut is also provided with a removable steel valve seat 17, and the opposite end of the valve cage is provided with a reduced threaded end portion 18. The cage contains a ball valve 19, which is adapted to seat against the valve seat 17. The threaded terminal end of the nut 15, may be connected to a plunger which would be interposed between the cage and the upper end of my present device, but we do not illustrate this construction, as it, together with the valve cage and ball valve and steel valve seat, does not form any part of our invention, and all three are oil drilling members that are in common use.

The operation of our valve is as follows: The valve is adapted to be used in an oil well casing or working barrel 20, and the valve is put together and operates in the following manner: The tubular packing is mounted on the center tube 1, and the circumferential grooves in the inner periphery of the hose fit over the collars and its tapering end fits into the concave cupped recess of the cup extension of the nut, and when the cupped nut 8, is screwed onto the end 2 of the center tube the threads in the cupped recess screw onto the tapering end of the tubular packing, and compress the tubular packing tightly around the end of the center tube, and the raised spurs 5 sink into the inner peripheral surface of the tubular packing, and into the reduced neck portion 4, and between and over and around the collars, and as the cupped nut is tightened on the tapering end of the tubular packing the packing is most rigidly and securely clamped to the cupped nut by its threads and to the projecting collars, the spurs, and the reduced neck portion of the end 2, of the center tube. The opposite end of the packing tube is held under resilient expanding pressure by the expansive pressure of the spring and the weight of the fluid exerted against the upper end of the conical collar, which forces the conical end of the collar into the beveled end of the tubular packing, and acts to expand this end,

and also to crowd the packing tube toward the end that is held by the cupped nut. This automatically operating resilient expansive movement of the tubular packing ring permits this valve packing to resiliently and yieldingly adjust itself to its valve seat in the casing 21, and to contract into the reduced neck portion 7, at its free end portion, and move the conical collar against its spring, as it reciprocates therein, and thus enable it to maintain always a tight fit in the valve seat of its surrounding casing, while the clamping joint at the opposite end of the valve holds the packing so rigidly that it can not be accidentally detached from the center tube.

Our invention is simple, and makes a perfectly practical and reliable automatically yielding and flexible oil or water well casing valve.

Having described our invention, what we claim as new and desire to secure by Letters Patent is:

1. In an oil or water well valve, a center tube, projecting abutment members adjacent to one end of said tube, a thread on the end of said center tube adjacent to said projecting abutments, a nut threaded to the threaded end of said center tube provided with a threaded cupped extension, and a packing fitting around said center tube and having its end projecting into the cupped extension of said nut, and adapted to be rigidly clamped to said center tube, and its projecting abutments.
2. A well valve, comprising a tubular valve seat, a center tube, a packing surrounding said central tube, means including a nut rigidly clamping one end of said packing to said tube, and means including a spring actuated collar mounted on said center tube and arranged to enter the free end of said packing to automatically expand it as it is operated in its seat.
3. In a well valve, the combination with a suitable valve casing, of a center tube provided with threads at its opposite ends, projections on one end portion of said tube, reduced neck portions in predetermined positions in the opposite end portions of said tube, a tubular packing of any suitable material fitting tightly over said tube and its projections, having a tapering terminal end adjacent to said tube's projections, a nut threaded to the end of said tube adjacent to said tube's projections, having an interiorly threaded cupped extension adapted to screw onto the tapering end of said tubular packing and rigidly grip the end of said tubular packing and clamp it to the adjacent end of said center tube and to said tube's projections and neck portion, said tubular packing extending from its rigidly held end free on said center tube over the reduced neck portion of the opposite end of said tube, a collar or sleeve slidably mounted on said center tube and provided with a conical end extending into the free end of said tubular packing, a nut on the end of said center

tube adjacent to said sleeve, and an expansive spring on said center tube between said nut and collar arranged to exert an adjustable tension against said collar and force said collar's conical end into the free end of said tubular packing and thereby expand said tubular packing.

4. In a well valve, the combination of the center tube, a resiliently yielding tubular packing mounted on said center tube, means including a clamping device for rigidly securing one end of said tubular packing to said tube, and means including a spring for expanding the free end of said resiliently yielding tubular packing.

5. In an oil or water well valve, the combination of a supporting valve casing, with a valve, comprising a center tube provided with projecting collars and spurs at one end, and with reduced neck portions intermediate of its ends, and with nuts threaded to its opposite ends, a resilient tubular packing rigidly clamped at one end to the end of said center tube having the collars and spurs by one of said center tube's nuts and into its end portion adjacent to said projecting collars, and having its opposite end free on said center tube, the conical ended collar slidably mounted on said center tube and arranged to project into the free end of said packing tube, the nut threaded to the end of said center tube adjacent to said conical collar, and the expansive spring mounted on said center tube and arranged under expansive tension between said nut and said slidable conical ended sleeve.

6. In an oil or water well valve, the combination of the center tube, the tubular packing arranged to be rigidly clamped at one end to said tube and to be free at its opposite end, the concaved recessed nut for clamping said tubular packing at one of its ends to said center tube, the slidable conical ended collar projecting into said packing tube's free end, the expansive spring, and the nut, said nut being provided with a ball valve seat and arranged to detachably support a ball valve cage and ball valve in operative relation to its valve seat.

7. In an oil well valve, the combination of the center tube, the packing mounted on said center tube end rigidly secured at one of its ends to one end of said center tube, and arranged snugly on but free of said center tube along the remainder of its length, a reduced neck portion in said tube over which the free end portion of said packing is positioned adapted to allow the free end portion of said packing to contract in said neck portion under contracting pressure, and a spring-controlled tapering ended collar slidably and adjustably mounted on said center tube, and extending into the free end of said packing and adapted to automatically expand its free end portion.

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

LAFAYETTE DURKEE.
GEORGE WALTER.

Witnesses:

LORING HERRICK,
CLARENCE F. SWARTS.