

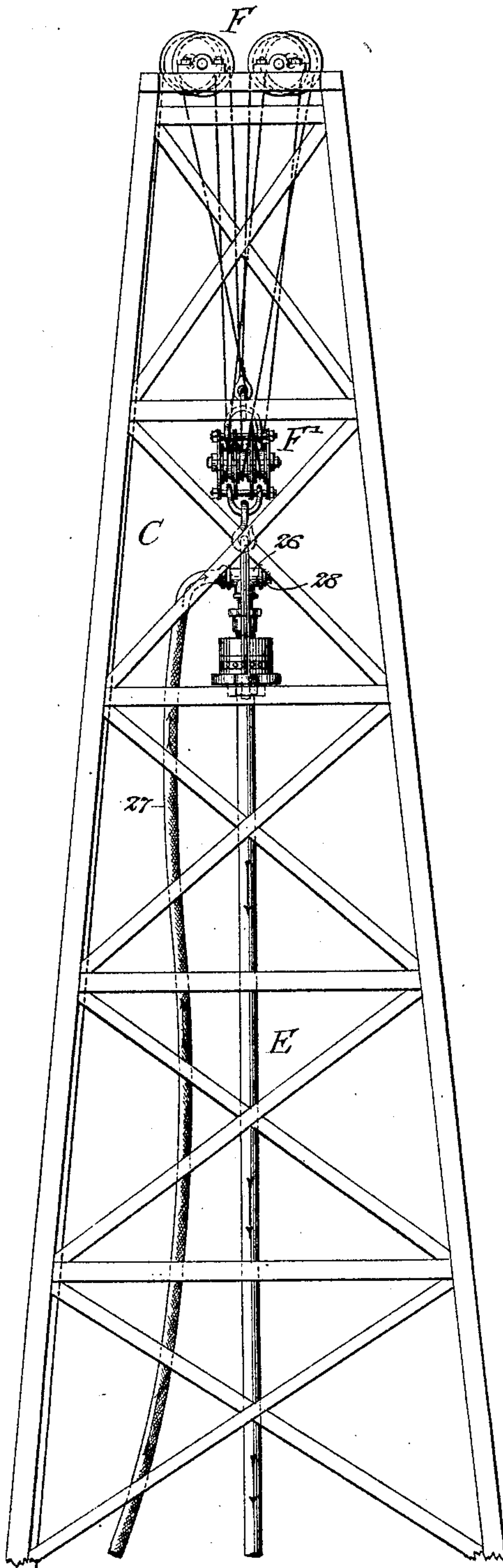
No. 799,597.

PATENTED SEPT. 12, 190

L. B. EMBRY.  
HYDRAULIC SWIVEL.  
APPLICATION FILED SEPT. 15, 1902.

3 SHEETS—SHEET 1.

*Fig. 1*



*Witnesses:-*  
*Amos M. F. Whitehead*  
*J. B. Weir*

*Inventor:-*  
*Leonard B. Embry*  
*by*  
*Chas. G. Page*  
*att'y.*

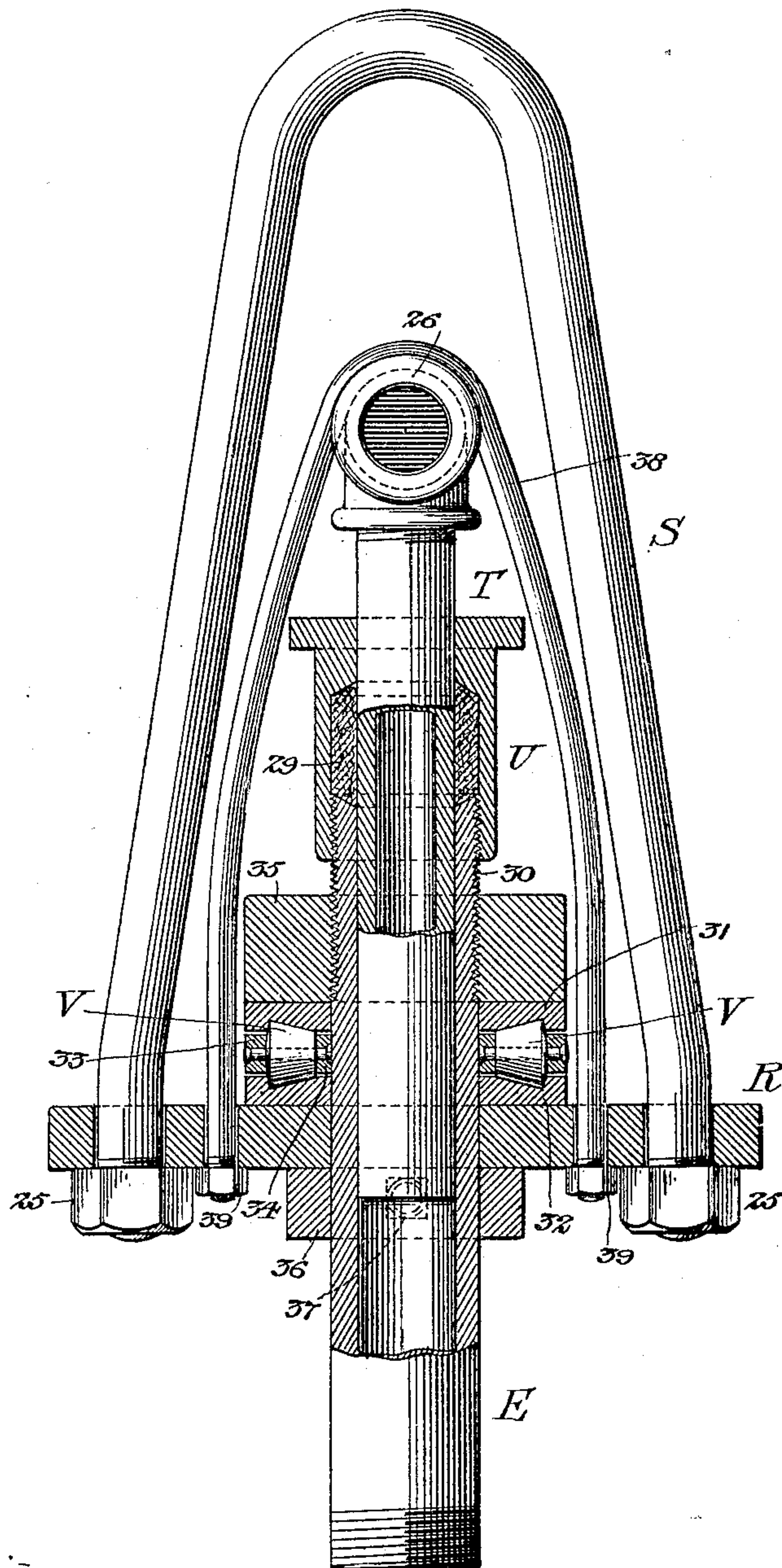
No. 799,597.

PATENTED SEPT. 12, 1905.

L. B. EMBRY.  
HYDRAULIC SWIVEL.  
APPLICATION FILED SEPT. 15, 1902.

3 SHEETS—SHEET 2.

Fig. 2.



Witnesses:-

*Wm. H. Whitehead*  
*J. B. Weir*

Inventor:

*Leonard B. Embry*  
*by Chas. G. Page*  
*Atty.*

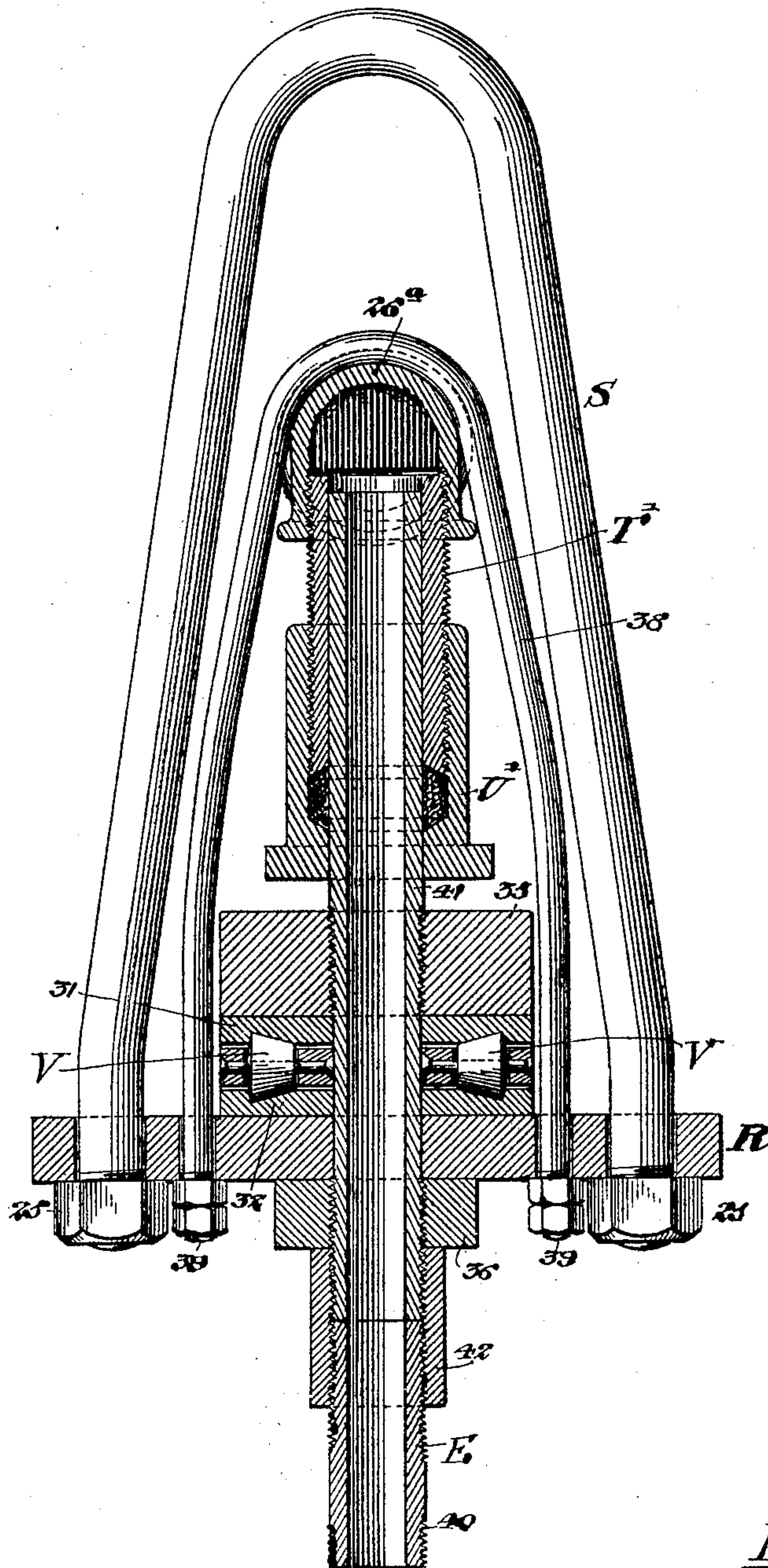
No. 799,597.

PATENTED SEPT. 12, 1905.

L. B. EMBRY.  
HYDRAULIC SWIVEL.  
APPLICATION FILED SEPT. 15, 1902.

3 SHEETS—SHEET 3.

Fig. 3.



Witnesses:-

*Wm. H. F. Whitbread.*

*J. B. Weir*

Inventor.

*Leonard B. Embry.*

*by Chas. G. Page*  
*Atty.*



# UNITED STATES PATENT OFFICE.

LEONARD B. EMBRY, OF MIDLOTHIAN, TEXAS, ASSIGNOR TO ARTHUR CAMERON, OF CHICAGO, ILLINOIS.

## HYDRAULIC SWIVEL.

No. 799,597.

Specification of Letters Patent.

Patented Sept. 12, 1905.

Application filed September 15, 1902. Serial No. 123,456.

*To all whom it may concern:*

Be it known that I, LEONARD B. EMBRY, a citizen of the United States, residing at Midlothian, in the county of Ellis and State of Texas, have invented a certain new and useful Improvement in Hydraulic Swivels, of which the following is a specification.

Objects of my invention are to provide a simple, compact, and efficient water-swivel for well-drilling machines, to reduce friction between the water-swivel and the drill-rod, and to provide certain novel and improved details of construction and arrangement.

In the accompanying drawings, Figure 1 is a side elevation of the upper portion of a well-machine including the upper portion of the derrick and the water-swivel. Fig. 2 shows the water-swivel, partly in elevation and partly in vertical central section, on a larger scale than in Fig. 1. Fig. 3 is a view similar to Fig. 2, showing, however, a slight modification in the construction of a portion of the water-swivel, as hereinafter explained.

E indicates the hollow drill-rod, which is understood to be revolved axially during its usual reciprocating or jumping action, and in order to permit a supply of water to be forced down through the hollow drill-rod I provide a water-swivel which, as shown in Fig. 2, is constructed as follows: The hollow drill-rod passes through a bearing frame or plate R, which is suspended from any ordinary or suitable tackle-block F', Fig. 1, by a suspending device, such as a yoke S, having its ends inserted through the marginal portion of the frame or plate R and provided with nuts 25 on their terminal portions below the said frame or plate. A tube or pipe section T, having an inlet-coupling, such as a hollow T-head 26, (see also Fig. 1,) has its lower end portion fitted as a sleeve within the upper end portion of the hollow drill-rod, so as to form a swivel-joint, and for the purpose of introducing a supply of water the hollow T-head 26 is connected at one end with a flexible hose-pipe 27, the opposite end of the horizontal portion of the T-head being closed, as at 28, by a suitable cap or plug. In order to prevent leakage, the tube-section T and the hollow drill-rod extend within a stuffing-box U, containing a suitable packing 29, the said stuffing-box being internally threaded and screwed upon an external portion 30 of the drill-rod. Antifriction cone-shaped rolls V

are arranged between bearings formed by ring-plates 31 and 32 and journaled in a pair of annular bearings or rings 33 and 34, which lie between the bearings 31 and 32. These annular bearings or ring-plates 31 and 32 are grooved in conformity with and to form tracks for the antifriction-rolls V, said plates or bearings 31 and 32 being arranged around the well-tube, with the power plate or bearing 32 supported upon the frame or plate R. A nut 35 is screwed upon a threaded portion 30 of the drill-rod and adjusted against the upper ring-plate or annular bearing 31, and a nut 36 is applied to the drill-rod and fitted against the under side of the frame or plate R. The drill-rod can be externally threaded for the nut 36, or the latter can be secured to the drill-rod by a set-screw, as indicated by dotted lines. The tube-section T is tied to the frame or plate R by a yoke 38, arranged to cross and engage the upper horizontal portion of the T-head 26 and having its lower end portions inserted through the frame or plate R and provided with nuts 39, which are tightened against said plate or frame. During operation the hollow drill-rod and the stuffing-box will turn independently of the tube-section T, and during such operation the nut 35 and the upper ring-plate or bearing 31 will turn with the drill-rod, it being seen that the weight of the drill-rod is sustained by the antifriction-rolls V, which latter are in turn supported by the frame or plate R, carrying a lower bearing 32 for the antifriction-rolls.

In Fig. 3 the construction of water-swivel shown is generally similar to that shown in Fig. 2. In said two figures the same parts are correspondingly indicated by reference numerals and letters. The modifications in Fig. 3 are as follows: The nut 36 is threaded and screwed upon a threaded portion of the tube or hollow drill-rod E, which is shown as comprising a lower section 40 and an upper section 41, held together by a coupling 42, arranged below the nut 36. The inlet-coupling or hollow T-head 26<sup>a</sup>, corresponding in function with the inlet-coupling or hollow T-head 26 of Fig. 2, is provided with or screwed upon a tube-section T', which corresponds with the tube-section T of Fig. 2, but which in place of being fitted within the tube or hollow rod E is fitted upon the latter as an outer sleeve and externally threaded, so as to screw into a stuffing-box V', corresponding in function



with the stuffing-box V of Fig. 2. The construction illustrated by Figs. 2 and 3 involve, however, the following features common to both, to wit: The tube E, which may be a tube or a tubular drill-rod, is arranged to extend through and revolve independently of a bearing frame or plate R, which is attached to suspending means, such as a yoke S or other analogous device. The tube E also has a swivel connection with the inlet-coupling which is tied to the frame or plate R, and the antifriction-rolls, which take the weight of the tube E, are arranged between the frame or plate R and a stop or shoulder 35 on the tube. In Fig. 2 the stuffing-box V turns with the tube E, to which it is secured, as by a threaded joint, and hence turns upon the short tube, section T of the inlet-coupling, while in Fig. 3 the tube E turns independently of the stuffing-box, the latter being secured to the inlet-coupling by the short tube-section or sleeve T, which receives the upper end portion of the tube E. In each case, however, the stuffing-box is exposed and readily accessible, and the inlet-coupling with which the hose is connected is tied to the bearing-plate in a simple and effective way, permitting its detachment without disturbing the antifriction-rolls and their bearings. The plate or nut 35, which forms a stop or shoulder on the tube E, is adjustable thereon, and the stuffing-box can be easily adjusted for the purpose of tightening up the packing.

What I claim as my invention is—

1. In a water-swivel for well-drilling machines, a bearing frame or plate and a suspending device extending upwardly therefrom; a tube extending through an opening in the bearing frame or plate; an inlet-coupling having a swivel connection with the upper end portion of said tube and tied to the bearing frame or plate; a bearing on the said tube at a point between the inlet-coupling and the bearing frame or plate; and antifriction-rolls arranged between said bearing on the tube and the bearing frame or plate and sustaining the weight of the tube.

2. In a water-swivel for well-drilling machines, a bearing frame or plate with which the well-tube or hollow drill-rod has a swivel connection; an inlet-coupling tied to said bearing frame or plate and having a hollow stem or tube-section fitted to the upper end portion of the well-tube or hollow drill-rod, and a

stuffing-box for the joint between said sleeve or tube-section on the inlet-coupling and the well-tube or hollow drill-rod, said well-tube or hollow drill-rod being arranged to turn independently of the sleeve or tube-section on the inlet-coupling.

3. In a water-swivel for well-drilling machines, the combination with a well-tube or hollow drill-rod, of a bearing frame or plate R through which the well-tube or hollow drill-rod extends, said tube or rod being rotatable independent of said bearing frame or plate; a suspending-yoke S attached to the bearing frame or plate; an inlet-coupling having a swivel connection with the well-tube or hollow drill-rod, and tied to the bearing frame or plate by a yoke 38; a nut 35 on the well-tube or hollow drill-rod; bearing-rings 31 and 32 between the nut 35 and the bearing frame or plate; and antifriction-rolls arranged between said bearing-rings.

4. In a water-swivel for well-drilling machines, a bearing frame or plate R; a well-tube or hollow drill-rod extending through and rotatable independently of the bearing frame or plate; an inlet-coupling having a swivel connection with the well-tube or hollow drill-rod and held against rotation independently of the bearing frame or plate; a sleeve or tube-section extending downwardly from the inlet-coupling and fitted to the upper end portion of the well-tube or hollow drill-rod which is revoluble independent of said sleeve or tube-section; and a stuffing-box arranged to prevent leak at the swivel-joint formed by said sleeve or tube-section and the upper end portion of the well-tube or hollow drill-rod.

5. In a water-swivel for well-drilling machines, a plate having an opening for the drill-rod; a suspending-yoke having the lower ends of its arms attached to the plate at opposite sides of the opening in the latter; a drill-rod extending through and arranged to turn within the opening in said plate and externally threaded at a point above the latter; bearings and antifriction-rolls arranged between said nut and plate; and an inlet-coupling having a swivel connection with the upper portion of the drill-rod and tied to the plate in which the drill-rod is arranged to revolve.

LEONARD B. EMBRY.

Witnesses:

CHARLES G. PAGE,  
OTTILIE C. MEERING.