

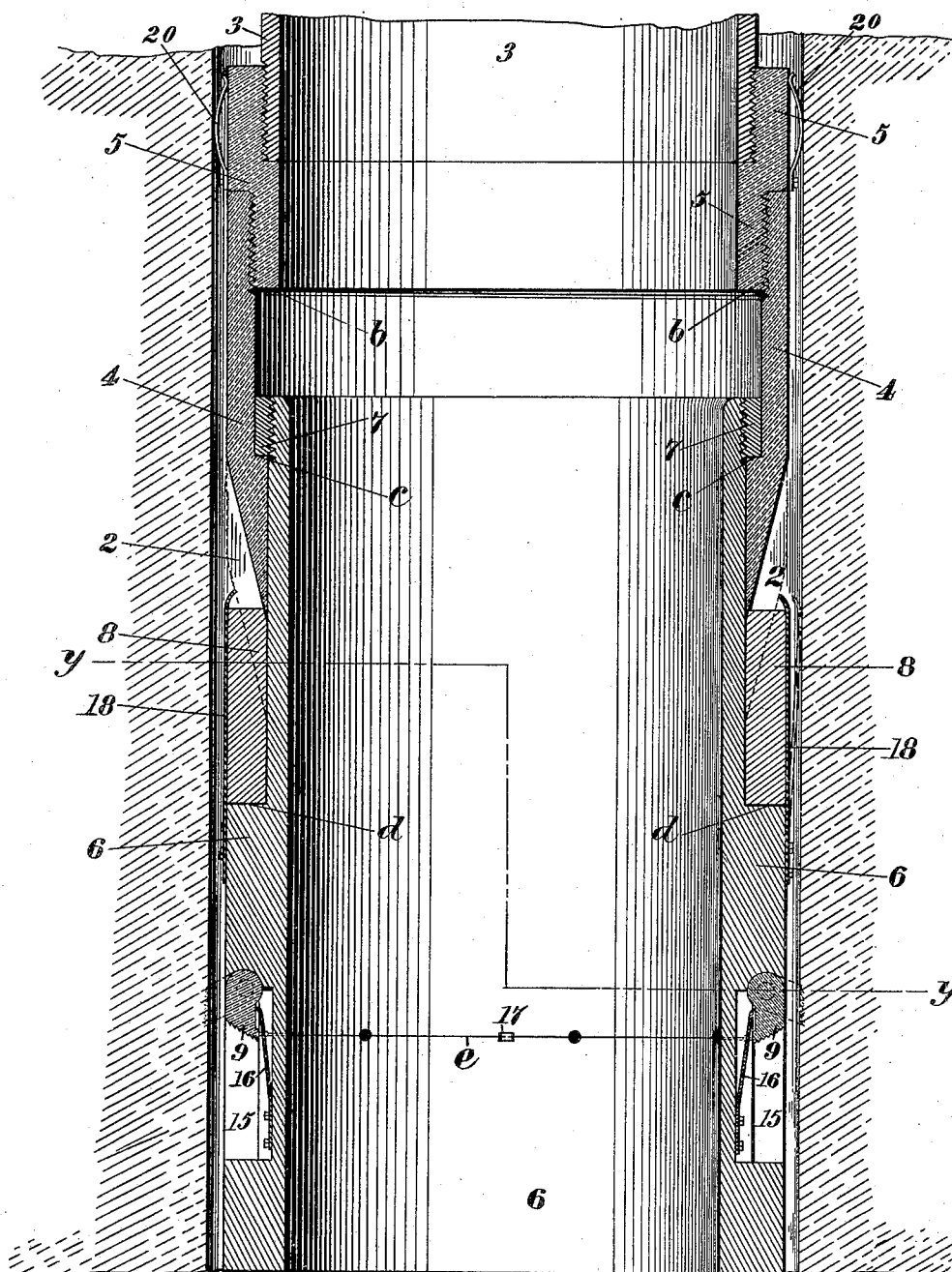
(No Model.)

2 Sheets—Sheet 1.

R. W. MILLER & J. McCONNELL.
OIL WELL CASING.

No. 344,849.

Patented July 6, 1886.



Witnesses.

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M. A. Conwin

Fig. 1.

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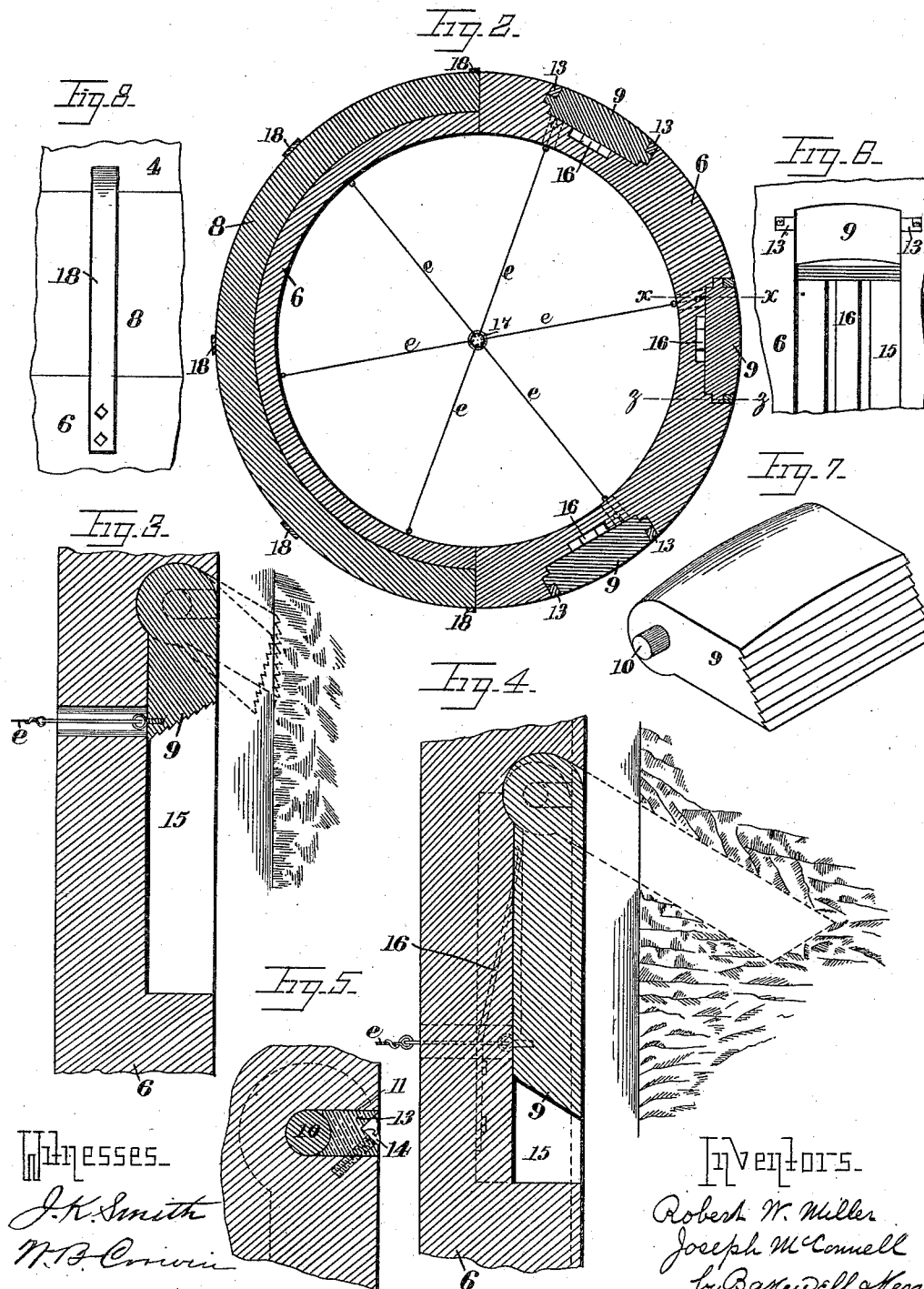
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UNITED STATES PATENT OFFICE.

ROBERT W. MILLER, OF ALLEGHENY CITY, AND JOSEPH McCONNELL, OF
PITTSBURG, PENNSYLVANIA.

OIL-WELL CASING.

SPECIFICATION forming part of Letters Patent No. 344,849, dated July 6, 1886.

Application filed April 26, 1886. Serial No. 200,121. (No model.)

To all whom it may concern:

Be it known that we, ROBERT W. MILLER, of Allegheny City, and JOSEPH McCONNELL, of Pittsburg, in the county of Allegheny and State of Pennsylvania, have invented a new and useful Improvement in Oil-Well Casings; and we do hereby declare the following to be a full, clear, and exact description thereof, reference being had to the accompanying drawings, forming a part of this specification, in which—

Figure 1 is a vertical axial section of an oil-well, showing that part of the casing to which our invention is applied. Fig. 2 is an irregular horizontal cross-section on the line *yy* of Fig. 1. Fig. 3 is an enlarged longitudinal section of a part of the casing on the line *xx* of Fig. 2. Fig. 4 is a similar view illustrating a modification. Fig. 5 is a vertical section on the line *zz* of Fig. 2. Fig. 6 is a front plan view of the part shown in Fig. 5. Fig. 7 is a perspective view of a part. Fig. 8 is a front plan view of one of the springs marked 18 in Figs. 1 and 2.

Like symbols of reference indicate like parts in each.

In drilling oil-wells, in order to keep the water from the upper strata of earth from flowing down to the oil-producing strata, and thereby filling up the hole and driving back the oil, it has been customary to insert a casing or tube into the hole extending from the top down below the water-strata. A packing of rubber or other suitable material is fitted around the casing at a point which, when the casing is set in place, is below the lowest water-veins. The compression of this packing between the casing and the sides of the hole seals the space between them and prevents the descent of the water.

It is the object of our invention to improve the construction of such packing, and to provide means for supporting the casing in the well at any desired point.

In the drawings, 2 represents the oil-well, and 3 is a section of the casing. The casing consists of pipe-sections or tubes, which, being screw-threaded, are coupled together and let into the well in the usual way.

6 is the lowest section of the casing. It is

joined to the next adjoining section by a sliding joint which forms part of our invention, and which we will now describe.

To the end of the section 3 is attached a tube, 4, by means of an intermediate connecting-nipple, 5, the lower end of which constitutes a stop or shoulder, *b*. The upper portion of the section 6 is reduced in diameter; and the tube 4 fits around it, as shown in Fig. 1. The end of the tube 4 is beveled, so that a cross-section of its side shall be wedge-shaped. The tube 4 and the casing-section 6 are united by means of a collar, 7, which is screwed to the upper end of the section 6, there being a shoulder, *c*, on the tube 4 below this collar. The tube 4 may thus be slid up and down on the section 6; but the engagement of the collar 7 with the shoulder *c* will prevent their disjunction, and will support the casing-section 6 when the casing is let into the well. Below the tube 4, on the reduced part of the casing-section 6, is fitted a rubber gasket or ring, 8, whose base rests on a shoulder, *d*, of the casing.

A series of catches, 9, are arranged around the periphery of the casing-section 6, near its bottom, which are designed to engage the sides of the well-hole, and thus to support the casing. A perspective view of one of the catches is shown in Fig. 7. The casing-tube is suitably recessed, as at 15, to accommodate these catches, whose pintles 10 fit into open slots 11 in the sides of the recess, and are there held by blocks 13, set into the slots over the pintles and secured by set-screws 14. (See Sheet 2 of drawings.) The back edge of the catch is curved so that the catches may be turned back in their recesses to lie flush with the outside of the casing, as in Figs. 1, 2, and 5, or may be projected therefrom, as shown by dotted lines in Figs. 3 and 4. Springs 16 bear upon the catches and tend to project them. When the casing is let into the well, the catches 9 are held back in their recesses 15 by cords or light wires *e*, which are attached to the catches, and thence extend through the casing radially to its center, where they are tied to a ring, 17.

In Figs. 3 and 4 we show different forms of the catch 9, whose peculiar uses we will explain hereinafter.

The operation of the devices which we have explained is as follows: Fig. 1 represents the casing as it is when being lowered into the well from above, the casing-section 6 then depending from the sliding tube 4, by reason of the collar 7 seating on the shoulder *c*. When the casing has been lowered to the desired point, a weight is dropped into the well from above, which, striking upon the wires *e*, will disconnect them, and, releasing the spring-catches 9, will cause them to be projected from the outside of the casing in a downwardly-inclined direction. Then the weight of the casing will cause the end of the catches, which may be suitably roughened, to bite on the sides of the well and to uphold the casing. When the sides of the well at this point are rock, the catches are preferably short and blunt, as in Figs. 3 and 7. These catches are not designed to penetrate the rock, but only to bite upon it, and to uphold the casing by frictional contact. The form of catch shown in Fig. 4 is for use when the well-hole at the end of the casing is through clay or sand. This catch, being long and sharp, penetrates the clay, and so takes a firm hold thereon. By removing the blocks 13 the catches may be removed and others of the desired shape and size substituted.

It will be noticed that while the catches 9 are preferably provided with pintles 10, they are so set in their recesses 15 that the butt or rear ends of the catches shall bear against the upper wall of the recesses, which thus form sockets and take the strain caused by the weight of the casing from the pintles and put it on the casing itself. The device is thus rendered very strong and effective. The situation of the catches in the recesses 15, which are made in the shell of the casing-tube, enables them, when retracted, to lie flush with the outside of the casing, and to afford no obstacle to the descent of the latter into the well.

When the casing has been fastened in the well by means of the catches which we have described, the weight of the upper sections of the casing bearing on the tube 4 will cause it to slide downward over the casing-section 6. In its descent the wedge-shaped end of this tube will enter between the rubber gasket 8 and the outer periphery of the casing-section, as shown by dotted lines in Fig. 1, and, forcing the gasket outward, will compress it against the sides of the well, so as to pack the latter very securely. The casing will drop until the packing is compressed sufficiently to stop the descent of the sliding tube 4, or, at farthest, until the end *b* of the nipple 5 engages the upper end of the collar 7. The gasket 8 not only serves the purpose of packing the well, but has the additional function of assisting the catches 9 in upholding the casing.

The devices which we have shown permit the casing to be raised whenever it is desired. By lifting the upper sections of the casing the tubing 4 will move upward on the

casing-section 6, freeing its wedge end from the packing-ring until the shoulder *c* engages the bottom of the ring 7, when the section 6 will also be lifted and the catches 9 automatically disengaged from the sides of the well, as will be readily understood. After the casing has been raised to the desired point and released the catches 9 will again engage the sides of the hole, and the tubing 4 will descend, forcing out the gasket 8 and packing the casing, just as we have already described. In order to insure the restoration of the gasket 8 to its normal position when the casing is raised, and to prevent it jamming between the casing and the well, we employ a series of leaf-springs, 18, which are attached to the casing and extend upward outside of the gasket. The action of these springs is indicated by the dotted and full lines in Fig. 1.

The curved springs 20, which are shown on the outside of the casing in Fig. 1, are designed to bear against the sides of the hole and to center the casing therein, so that all the catches 9 may engage equally with the sides of the well-hole.

We claim—

1. The combination, with a deep-well casing-tube, of a catch pivotally mounted within a recess made in the tube itself, and arranged to lie within said recess, so as to be substantially flush with the outside of the casing, and to be capable of projection therefrom, substantially as and for the purposes described.

2. The combination, with a deep-well casing-tube, of a catch pivotally mounted within a socket or recess, and having its rear or butt end bearing against the wall of the recess or socket, substantially as and for the purposes described.

3. The combination, with a well-casing, of catches pivoted on the outside of the casing, and springs for projecting the catches, substantially as and for the purposes described.

4. The combination, with a well-casing, of catches pivoted within recesses in the casing-tube, springs for projecting the catches, and frangible connecting devices retaining said catches within their recesses, and arranged to permit their projection when the connecting devices are broken, substantially as and for the purposes described.

5. The combination, with a well-casing, of a packing-ring arranged to be compressed between the casing and the sides of the well, and springs 18, bearing against the outside of the packing-ring, substantially as and for the purposes described.

In testimony whereof we have hereunto set our hands this 20th day of April, A. D. 1886.

ROBERT W. MILLER.
JOSEPH McCONNELL.

Witnesses:

THOMAS W. BAKEWELL,
W. B. CORWIN.