No. 653,176. Patented July 3, 1900.

A. B. GRIDER.

DEVICE FOR OVERCOMING DEAD CENTERS.

(Application filed Oct. 16, 1899.)

(No Model.)

Fig. 1.

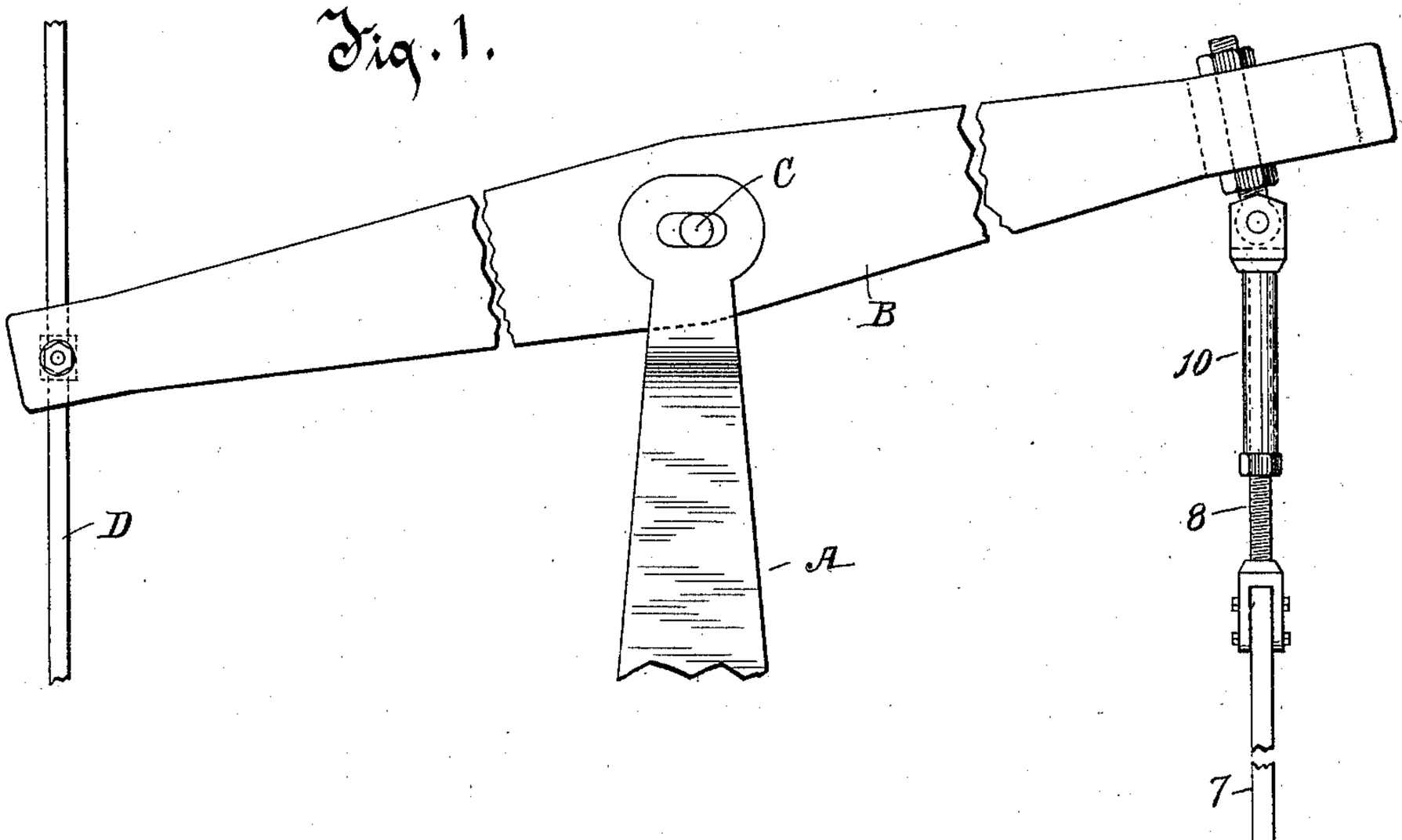


Fig. 3.

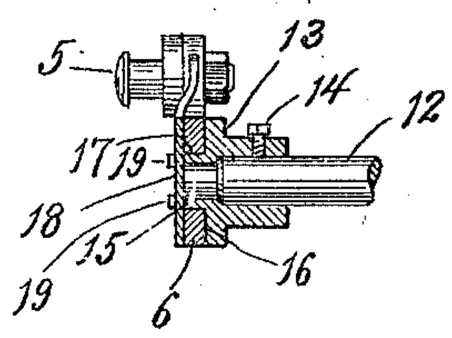
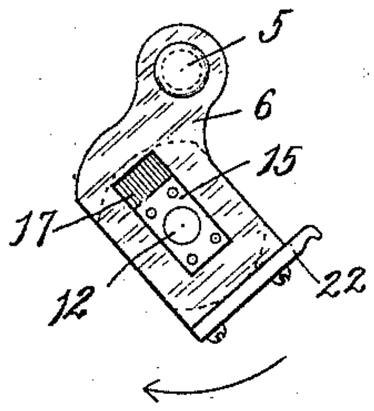


Fig. 2.



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UNITED STATES PATENT OFFICE.

ANDREWS B. GRIDER, OF MILWAUKEE, WISCONSIN.

DEVICE FOR OVERCOMING DEAD-CENTERS.

SPECIFICATION forming part of Letters Patent No. 653,176, dated July 3, 1900.

Application filed October 16, 1899. Serial No. 733,730. (No model.)

To all whom it may concern:

Be it known that I, ANDREWS B. GRIDER, of Milwaukee, in the county of Milwaukee and State of Wisconsin, have invented a new and useful Improvement in Devices for Overcoming Dead-Centers, of which the following is a description, reference being had to the accompanying drawings, which are a part of this specification.

My improved device for overcoming dead-centers is adapted for use in any place in machinery where a change from reciprocating to rotary motion occurs; but as I have applied it practically to use in converting the reciprocating movement of a pump-rod attached to a windmill into a rotary movement required for driving a feed-mill or analogous mechanism I have in the drawings herewith shown my improved device in connection with so much of the mechanism adapted for use with a windmill as is necessary to illustrate the operation of my improved device.

The invention consists of the device, its parts, and combinations of parts, as herein described and claimed, or the equivalents thereof.

In the drawings, Figure 1 is a view of my improved device attached to a rod connected with a walking-beam actuated by the pump-rod of a windmill. Fig. 2 is a detail of the slidable crank-arm on its shaft-head, the view being substantially the same as that shown in Fig. 3, but with the plate-cap and holding-spring shown in Fig. 1 omitted. Fig. 3 is a section of the improved device on line 3 3 of Fig. 1.

In the drawings, A is a fixed standard or part of a frame.

B is a walking-beam provided with a fulcrum-pin C, that projects at both sides of the beam and enters a horizontally-elongated slot therefor in the standard A. This construction provides for a limited lateral movement of the beam at its fulcrum, whereby its actuated end may move in a vertical plane instead of in an arc, as it would do if the fulcrum were without lateral movement.

D is a fragment of a pump-rod connected to a windmill, the pump-rod being so mounted and connected to the windmill as to have vertical reciprocal movement. At or near the other extremity of the walking-beam B it is connected by a rod to the wrist-pin 5 of the slidable crank-arm 6. The connecting-rod is advisably constructed with a medial member 7, that may be of wood, provided with terminal screws 8 9, one having a right-hand screw and the other a left-hand screw, these screws turning, respectively, into the head 10, which is hinged to the beam B, and into the head 11, which receives the wrist-pin 5 rotatively therein. By this construction the connecting-rod is readily lengthened or shortened, as desired, by rotating the medial member 7 and its screws 8 and 9.

The driven shaft 12, a fragment of which only is shown, is provided with a head-block 13, fitted thereon and secured adjustably thereto, conveniently by the set-screw 14. The head-block 13 is provided with a terminal laterally-elongated bearing part 15. The bearing part 15 is narrower in width than the body portion of the head-block, thus forming a bearing-shoulder 16 at each side of the bearing part 15. This bearing-shoulder 16 extends, preferably, entirely around the bearing part and is in a plane at a right angle to the shaft 12. The slidable crank-arm 6 is provided with an elongated slot 17, that receives therein the bearing part 15 of the head-block 13, and as the slot is longer than the lateral length of the part 15 the crank-arm is permitted to slide limitedly on the part 15. The arm 6 bears movably on the shoulder 16. The slot 17 in the arm 6 is disposed at an angle, preferably of about forty degrees, to the right line through the centers of shaft 12 and the wrist-pin 5. A plate-cap 18, placed over the arm 6 when it is in position on the block 13, is secured detachably to the block 13 by screws 19 19 through the plate turning into the bearing part 15. A spring 20, secured at one end to the cap 18 by means of a finger 21 on the cap, is secured at the other end to the arm 6, conveniently by means of a bar 22, affixed to the arm. This spring is adapted to hold the arm 6 normally in that position with reference to the block 15 and shaft 12 that is shown in Figs. 1 and 2, in which the wrist-pin 5 is at the greatest possible distance from the shaft 12. The tension of the spring is such as to hold the parts in the position stated under the ordinary strain of work and only to permit of a yielding or sliding movement

of the arm 6 under extraordinary strain or when the push or pull of the connecting-rod on the wrist 5 (when the wrist-pin is in line with the shaft 12 and the line of movement of the connecting-rod, or, in other words, when the wrist-pin is at its dead-center) causes the arm 6 to slide obliquely on the part 15, thus carrying the wrist-pin 5 away from its dead-center and to such an angle from the shaft and the line of motion of the connecting-rod as to cause the crank-arm and the shaft to be rotated by the push or pull of the connecting-rod.

What I claim as my invention is—

1. The combination with a rotatable shaft, of a crank-arm mounted on the shaft yieldingly and so as under excess of normal strain to yield thereunder moving laterally limitedly past the shaft at an oblique angle to the line of its wrist and the shaft, and means for retrieving the crank-arm when excess of strain thereon has ceased.

2. The combination with a shaft provided with a head having parallel bearing-surfaces transversely of and extending past the axis of the shaft, of a crank-arm slidable transversely on said head, said crank-arm being provided with a slot at an oblique angle to the line of its shaft-axis and its wrist which slot receives therein, and permits the arm to slide transversely on, the bearing part of the shaft-head adjacent to and past the axis of the shaft, and means for holding the crank-arm yieldingly in that position on the shaft-head in which the wrist is at its greatest distance from the shaft.

3. The combination with a shaft provided with a head having transverse bearing-surfaces, of a crank-arm slidable transversely on said head, said crank-arm being provided with a slot at an oblique angle to the line of its shaft-axis and its wrist which slot receives therein and permits the arm to slide transversely on the bearing part of the shaft-head, a cap secured to the shaft-head and holding the slidable crank-arm on the head, and a spring attached to the crank-arm and to the cap and adapted to distend the crank-arm normally yieldingly to its greatest distance from the shaft.

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

ANDREWS B. GRIDER.

Witnesses:

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