(No Model.) 3 Sheets—Sheet 1.

F. MÉNY.

MECHANICAL MOVEMENT.

No. 481,409. Patented Aug. 23, 1892.

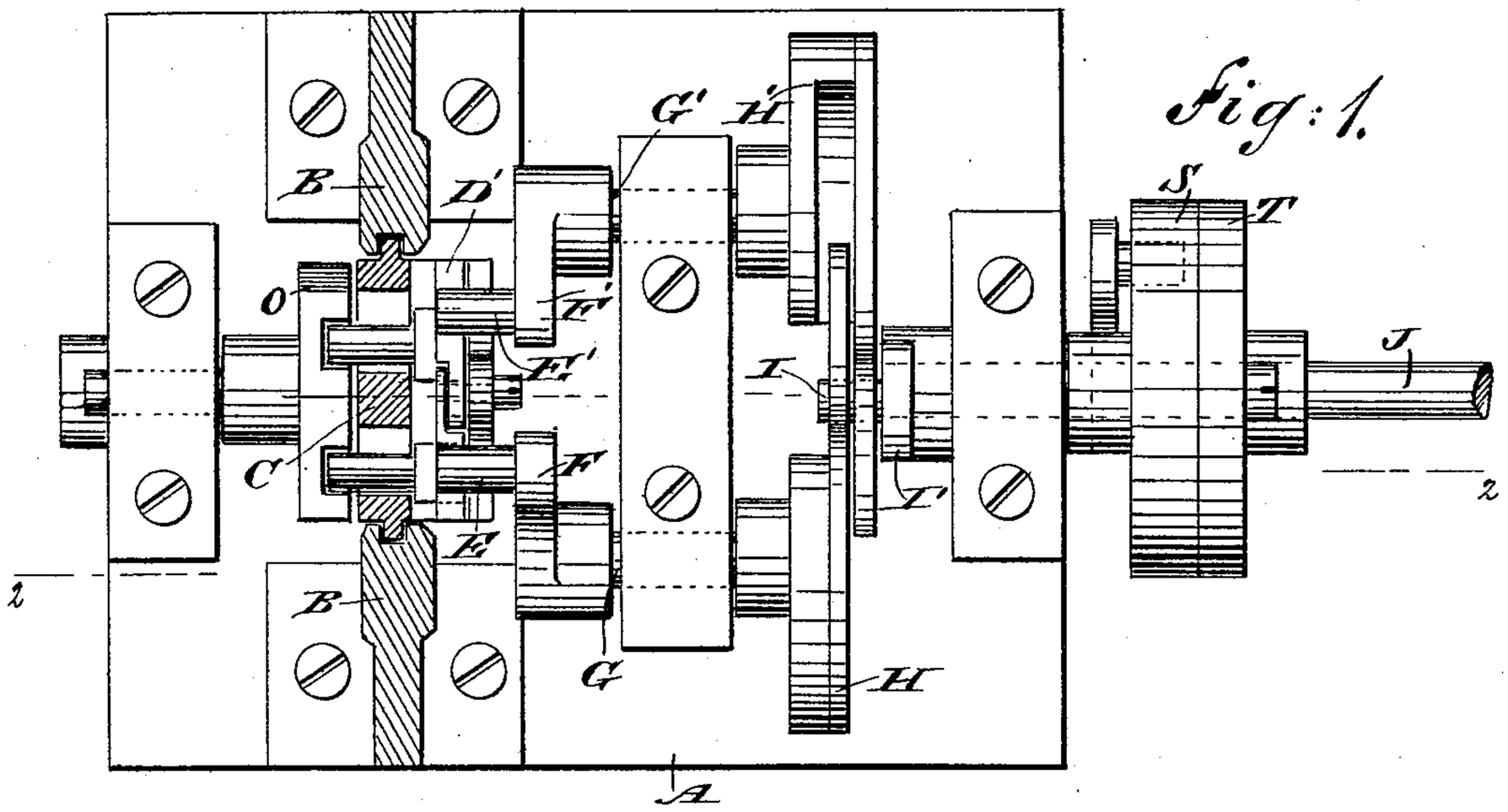

Fig: 1.

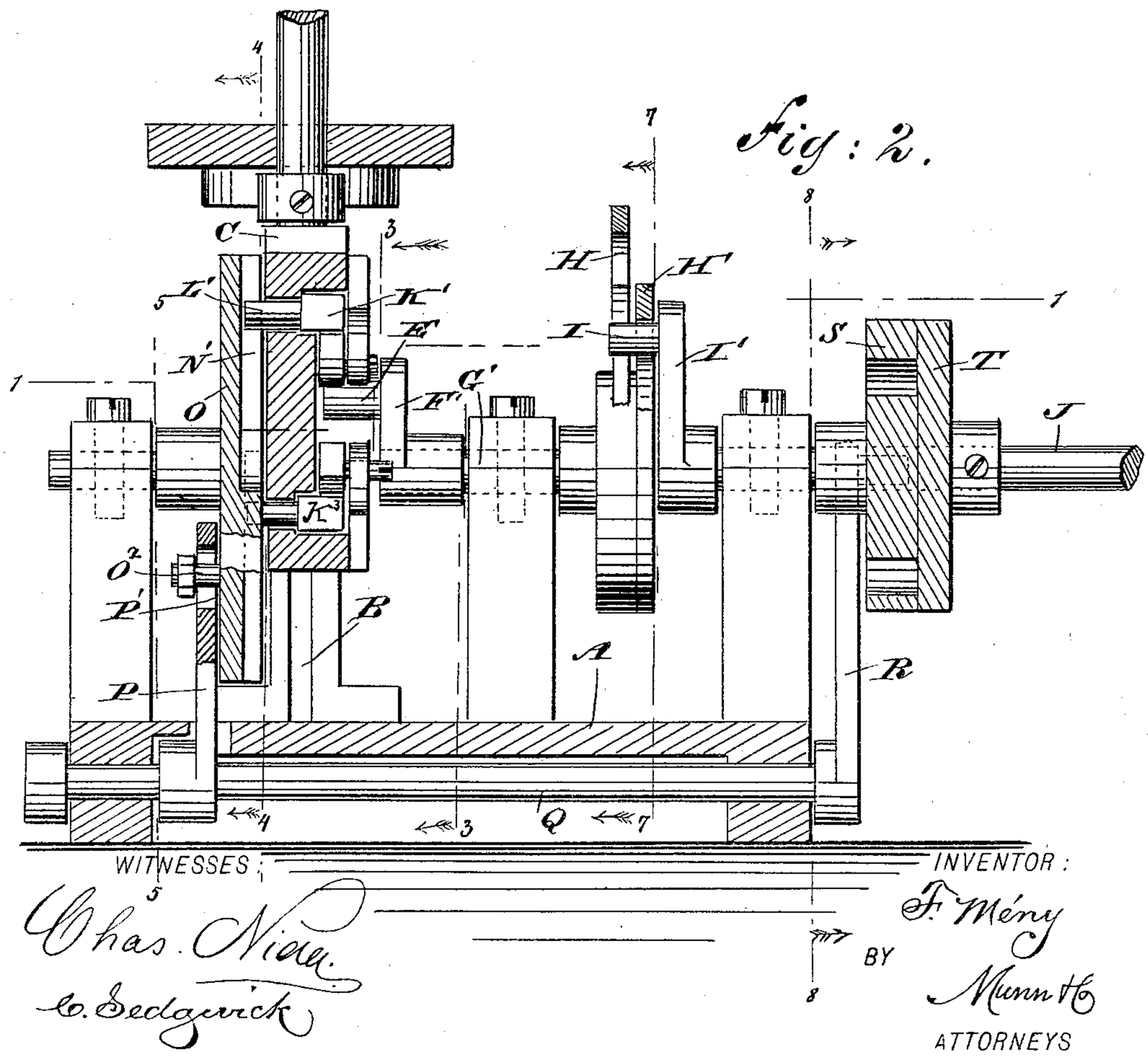

Fig: 2.

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Fig. 4.

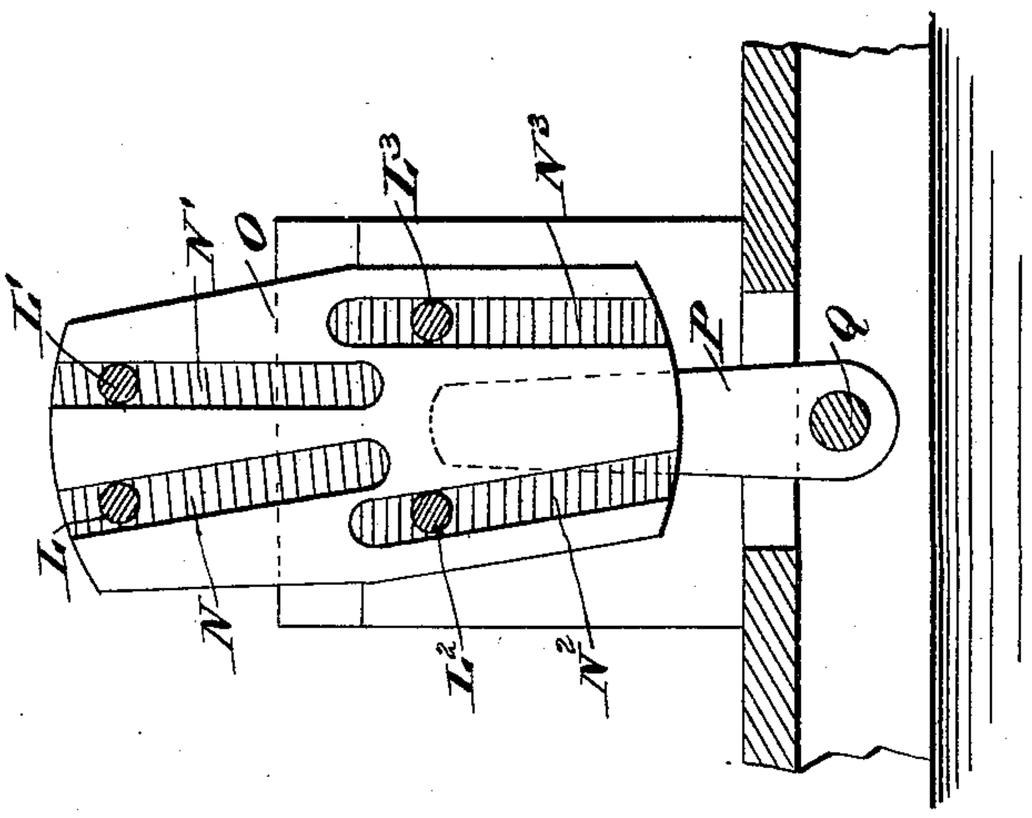

Fig. 3.

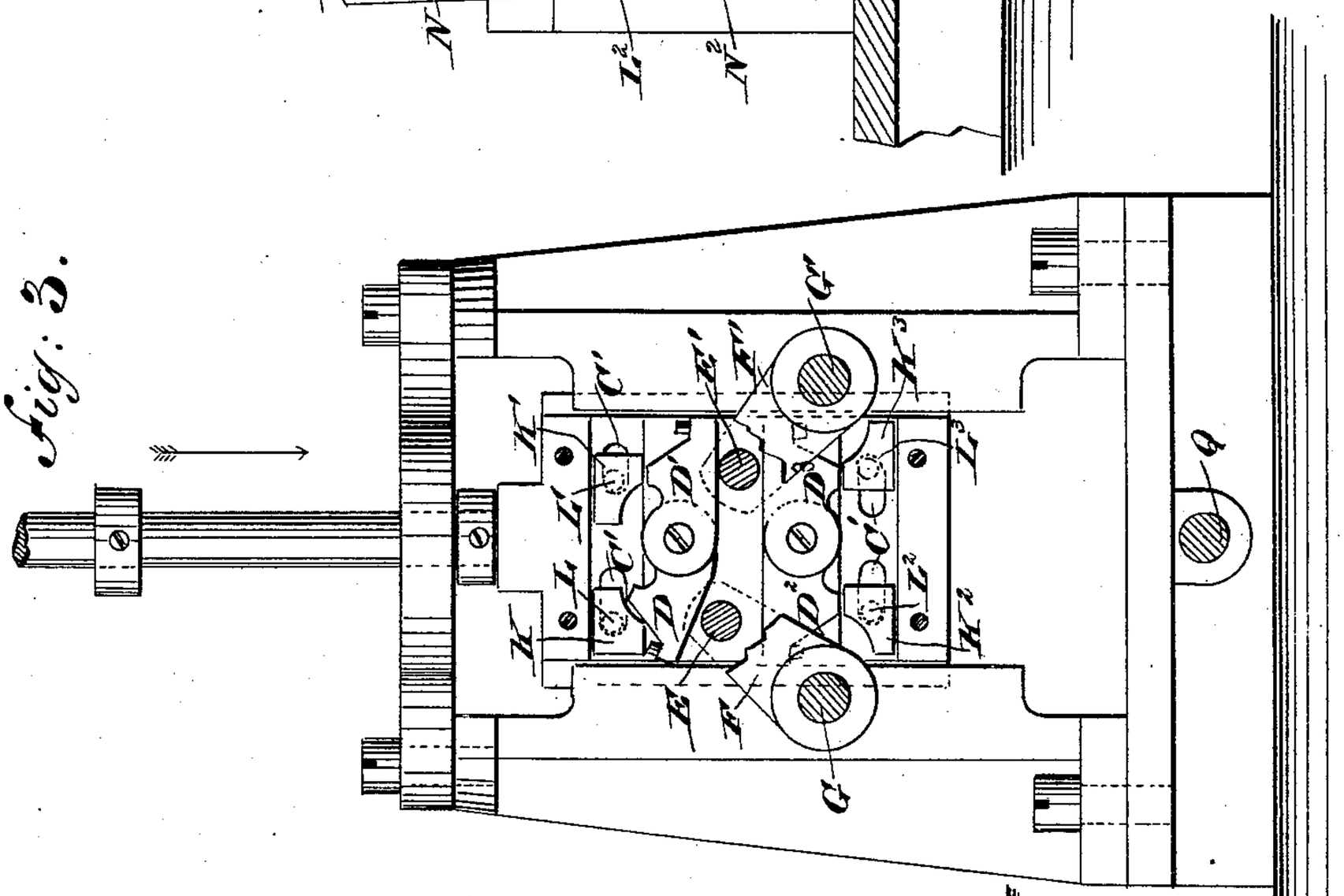

Fig. 5.

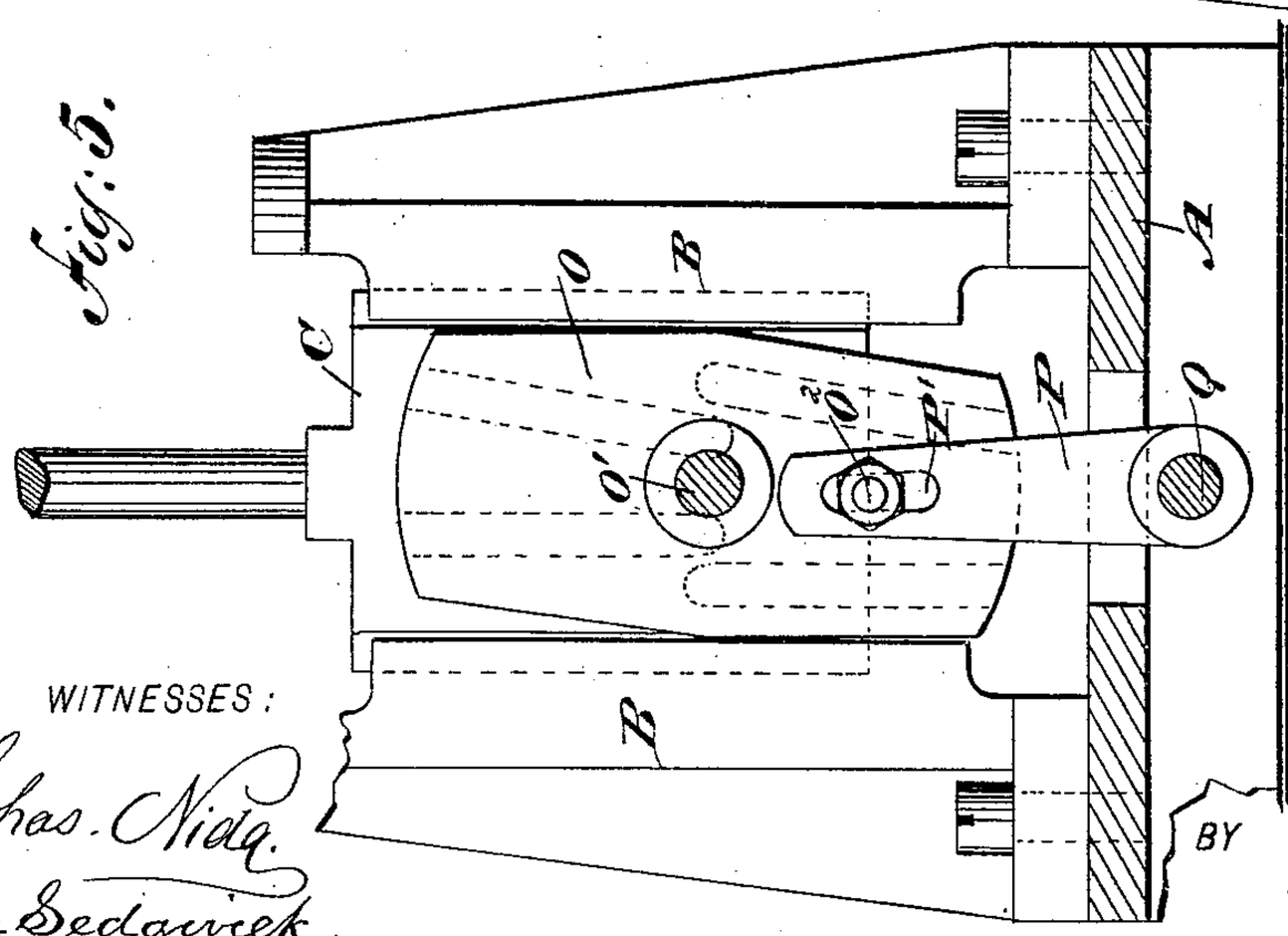

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Fig: 6.

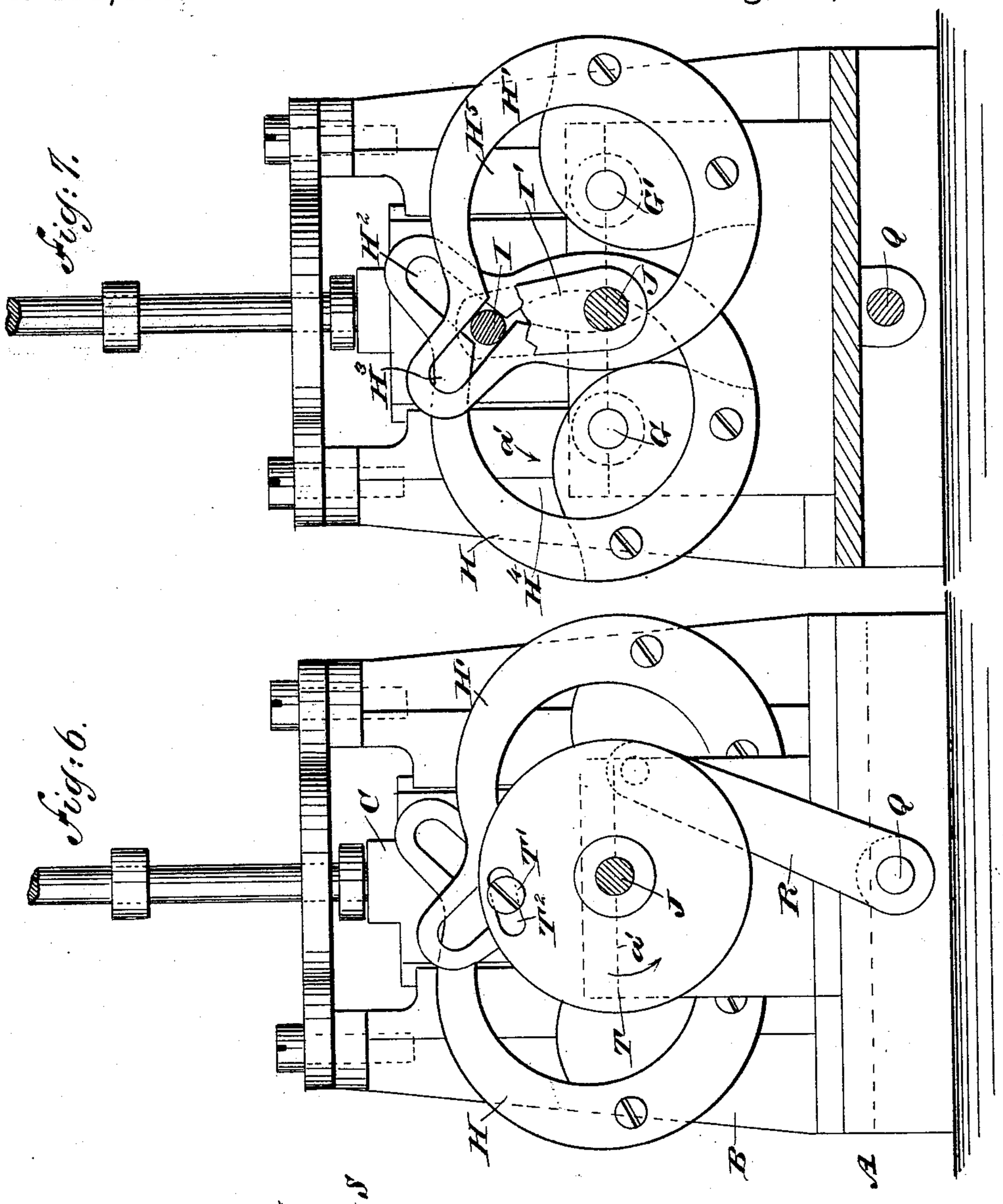
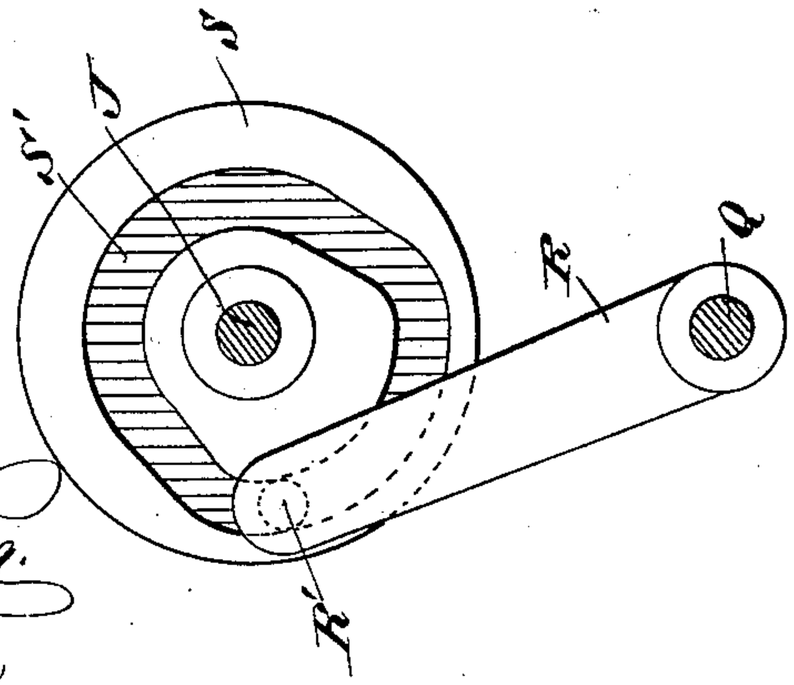


Fig: 8.



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UNITED STATES PATENT OFFICE.

FELIX MÉNY, OF ELIZABETH, NEW JERSEY.

MECHANICAL MOVEMENT.

SPECIFICATION forming part of Letters Patent No. 481,409, dated August 23, 1892.

Application filed December 30, 1891. Serial No. 416,520. (No model.)

To all whom it may concern:

Be it known that I, FELIX MÉNY, of Elizabeth, in the county of Union and State of New Jersey, have invented a new and Improved Mechanical Movement, of which the following is a full, clear, and exact description.

The invention relates to devices for converting reciprocating motion into rotary motion.

The object of the invention is to provide a new and improved mechanical movement arranged to transmit the power uniformly and without undue loss, dead-center positions being completely avoided.

The invention consists of two rock-shafts controlled from a reciprocating cross-head and provided with slotted arms or drivers, of which one delivers the crank-pin to the other to carry it around one-half revolution.

The invention further consists of a reciprocating cross-head provided with pivoted wings engaging the crank-arms of the rock-shafts and adapted to be locked in place.

The invention also consists of certain parts and details and combinations of the same, as will be fully described hereinafter, and then pointed out in the claims.

Reference is to be had to the accompanying drawings, forming a part of this specification, in which similar letters of reference indicate corresponding parts in all the figures.

Figure 1 is a sectional plan view of the improvement on the line 1 1 of Fig. 2. Fig. 2 is a sectional side elevation of the same on the line 2 2 of Fig. 1. Fig. 3 is a transverse section of the same on the line 3 3 of Fig. 2. Fig. 4 is a similar view of the same on the line 4 4 of Fig. 2. Fig. 5 is a like view of the same on the line 5 5 of Fig. 2. Fig. 6 is an end elevation of the same. Fig. 7 is a transverse section of the same on the line 7 7 of Fig. 2, and Fig. 8 is a similar view of part of the same on the line 8 8 of Fig. 2.

The improved mechanical movement is mounted on a suitably-constructed base A, supporting the guideways B, in which is mounted to slide vertically the cross-head C, connected in the usual manner with the machine the reciprocating motion of which is to be converted into rotary motion. On the front face of the cross-head C are pivoted the sets of wings D D′ and D^2 D^3, each set having a common pivot and the two sets having between themselves grooves for the passage of the wrist-pins E and E′, secured on the crank-arms F and F′, respectively fastened on the shafts G and G′, respectively mounted to rock in suitable bearings arranged on the base A.

The wrist-pin E is arranged between the two wings D and D^2, and the other wrist-pin E′ is arranged and operates between the two wings D′ and D^3. The forward ends of the rock-shafts G and G′ carry arms or drivers H and H′, respectively provided with slots H^2 and H^3, respectively engaging the wrist-pin I, held on the main crank-arm I′, attached to the shaft J, the rotary motion of which is to be transmitted to other machines.

The wings D, D′, D^2, and D^3 are mounted to swing, so as to release the wrist-pins E and E′ at the proper time, as hereinafter more fully described, and the said wings are also adapted to be locked in place by blocks K, K′, K^2, and K^3, respectively mounted to slide transversely on the front face of the cross-head C, the blocks K and K′ being arranged above the wings D D′ and the other blocks K^2 K^3 being arranged below the wings D^2 and D^3, respectively.

The blocks K, K′, K^2, and K^3 are provided with pins L, L′, L^2, and L^3, respectively extending rearward through transverse slots C′, formed in the cross-head C, the rear ends of the said pins engaging cam-grooves N, N′, N^2, and N^3, respectively arranged in one face of a cam-plate O, secured on a short shaft O′, mounted to turn in suitable bearings arranged on the base A. From the rear face of the cam-plate O extends a wrist-pin O^2, engaging a slot P′ in a crank-arm P, fastened on a shaft Q, extending longitudinally and mounted in suitable bearings on the under side of the base A.

On the front end of the shaft Q is secured an arm R, provided with a pin R′, traveling in a cam-groove S′ of a cam S, held loosely on the driven shaft J and attached to a disk T, rigidly secured on the said driven shaft J. The disk T is provided with a segmental slot T^2, through which passes a screw T′, screwing in the cam S, so as to fasten the latter on the disk T, and thus to the shaft J, the said cam, however, being adjusted to properly set the cam relative to the pin R′ of the arm R.

The slots H^2 and H^3 of the driving-arms H

and H′, respectively, are arranged radially relative to the shafts G and G′ and are arranged in line with the crank-arms F and F′, respectively held on the said shafts. The driving-arm H has a swinging motion from right to left downward and back again, while the other arm H′ has a swinging motion from left to right downward and back again, similar to the movement of the crank-arms F and F′.

The cam-plate O for controlling the movement of the locking-blocks K, K′, K², and K³ is arranged in such a manner that the blocks are shifted transversely to close on the wrist-pins E and E′, respectively, at the proper time, the cam-grooves N, N′, N², and N³ being arranged correspondingly—that is, the grooves N and N′ diverging from the pivot of the plate O upward and outward, while the other two grooves N² and N³ converge from the middle downward, as is plainly shown in Fig. 4. When the cross-head C is at the beginning of its downward stroke, the driving-arms H and H′ stand with their grooves H² and H³, respectively, in a right-angular position over the wrist-pin I, and at this time the wings D′ and D³ are closed by the blocks K′ and K³, respectively, while the other wing D is unlocked by its respective block K, as shown in Fig. 3. The downward movement of the head C now exerts a pressure on the said wrist-pin E′ to move the crank-arm F′, and consequently the driving-arm H′, in a downward direction, so that the driving-arm H′ drives the wrist-pin I forward in the direction of the arrow *a′*. (See Fig. 7.) As the wrist-pin I is still in engagement with the radial slot H² of the driver H, the latter is caused to swing upward a short distance, causing a like upward movement of the crank-arm F and its wrist-pin E, the upward movement of the latter being free on account of the wing D being unlocked by the block K. The upward movement of the wing D permits the crank-arm F and the driving-arm H to swing into an angular position of about fifty-two degrees, and then the wrist-pin E again comes in contact with the wing D and by the downward movement of the cross-head is caused to swing downward, causing a similar movement of the driving-arm H, as previously explained. The wrist-pin I travels in the enlarged opening H⁴ of the driving-arm H during the time the said wrist-pin is carried around one-half revolution by the arm H′, and on the return stroke of the wrist-pin it travels through the enlarged opening H⁵ of the arm H′ at the time the wrist-pin is carried upward in the slot H² of the driving-arm H. It will be seen that by this downward movement of the cross-head C the two arms H and H′ swing downward in opposite directions, so that their radial slots H² and H³ about meet when the crank-pin I assumes a lowermost position, it being, however, understood that the arm H leads somewhat, as during the downward movement the position of the locking-blocks is shifted—that is, the locking-block K moves inward to close the wing D, while the block K³ shifts outward and unlocks the wing D³ for the crank-arm F′ to permit the wrist-pin E′ to assume a position somewhat lower than the wrist-pin E can possibly attain. The transmission of the wrist-pin I from the slot H³ of the arm H′ to the slot H² of the arm H thus takes place before the cross-head and the wrist-pin I assume a lowermost position. Thus on the return stroke of the cross-head the wrist-pin I is fully under the control in the slot H² of the driving-arm H, and the driving-arm H′ is free to swing farther downward to assume an angular position of about fifty-two degrees, thus forming no obstruction to the wrist-pin and permitting the same to readily leave the slot H³ to travel in the opening H⁵ during the upstroke of the cross-head and the wrist-pin E. It will be seen that by this construction dead-center positions are completely avoided, so that the power is uniformly transmitted and without undue loss, except the usual loss by friction in the several parts. It is further understood that when the driving-arm H′ moves the crank-arm I on the downstroke of the cross-head C and has passed about one-half the downstroke then the wing D commences to close on the wrist-pin E, while the other wing D² is unlocked by the block K², so as to permit the wrist-pin E to gain on the other wrist-pin E′, held solidly in the groove between the two locked wings D′ and D³. In a like manner on the upward movement of the cross-head C the wing D′ is unlocked by the block K′ at about the time one-half of the upstroke is made, so that the wrist-pin E′ can gain on the wrist-pin E to bring the arm H′ into proper position at the time the cross-head C is at the end of its upstroke and the downstroke begins, as previously described. It is understood that this opening and closing of the wings D, D′, D², and D³ in the order named is accomplished by the shifting of the cam-plate O, controlled from the driven shaft J by means of the cam S, the arm R, the shaft Q, and the crank-arm P, pivotally connected with the said plate O.

Having thus described my invention, I claim as new and desire to secure by Letters Patent—

1. A mechanical movement provided with a reciprocating cross-head, two rock-shafts controlled from the said reciprocating cross-head, and slotted arms held on the said shafts, of which one delivers the main crank-pin to the other to carry it around one-half revolution, substantially as shown and described.

2. A mechanical movement comprising a reciprocating cross-head having pivoted wings, crank-arms engaged by the said pivoted wings, and rock-shafts carrying the said crank-arms and receiving a rocking motion on the up-and-down movement of the said cross-head, substantially as shown and described.

3. In a mechanical movement, the combination, with a reciprocating cross-head provided with wings having slots, of rock-shafts

provided with crank-arms, the pins of which pass between the said wings, and slotted arms held on the said rock-shafts and arranged to deliver the main crank-pin from one to the other, so that each carries the crank-pin during one-half revolution, substantially as shown and described.

4. In a mechanical movement, the combination, with a reciprocating cross-head provided with wings having slots, of rock-shafts provided with crank-arms, the pins of which pass between the said wings, slotted arms held on the said rock-shafts and arranged to deliver the main crank-pin from one to the other, so that each carries the crank-pin during one-half revolution, and means, substantially as described, for locking and unlocking the said wings on the cross-head, as set forth.

5. In a mechanical movement, the combination, with a reciprocating cross-head provided with wings having slots, of rock-shafts provided with crank-arms, the pins of which pass between the said wings, slotted arms held on the said rock-shafts and arranged to deliver the main crank-pin from one to the other, so that each carries the crank-pin during one-half revolution, blocks mounted to slide on the said cross-head and adapted to engage the said pivoted wings, and a cam-plate controlled from the main driving-shaft, mounted to swing, and formed with slots engaged by pins on the said blocks, substantially as shown and described.

6. A mechanical movement provided with slotted driving-arms, and a main crank-arm having a wrist-pin adapted to be alternately engaged by the said slotted driving-arms, substantially as shown and described.

7. A mechanical movement comprising two swinging drive-arms, each formed with a radial slot, and a main crank-arm provided with a wrist-pin engaging the said radial slots of the drive-arms, the latter being arranged to lead one another in their up-and-down movement, substantially as shown and described.

FELIX MÉNY.

Witnesses:
J. C. CONNOLLY,
JOSEPH MENY.