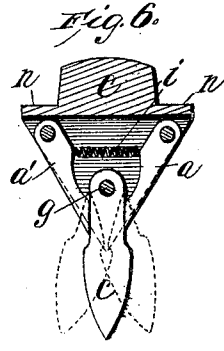
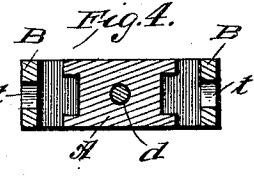
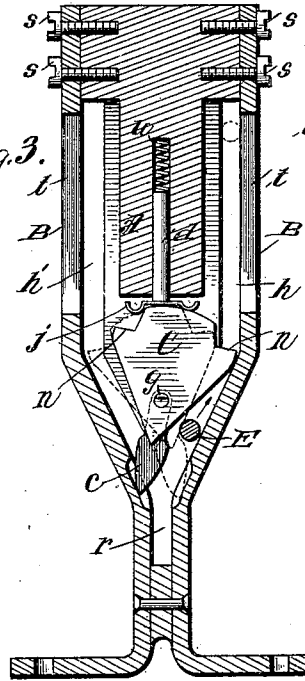
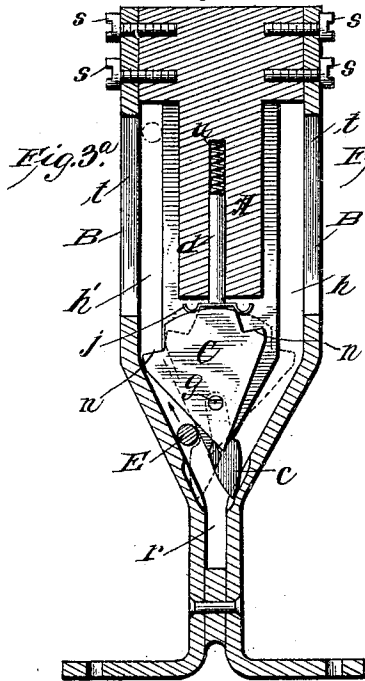
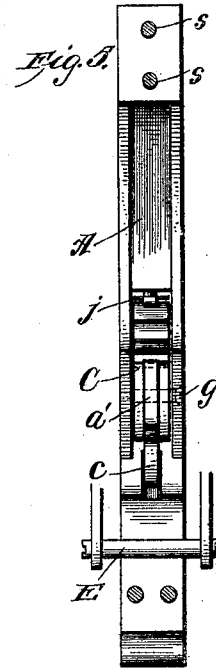
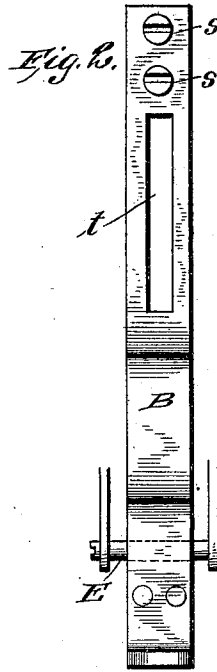
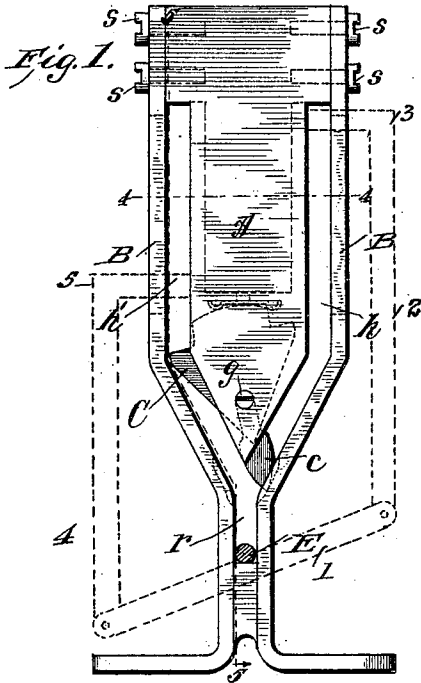


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MECHANICAL MOVEMENT.
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922,316.

Patented May 18, 1909.



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UNITED STATES PATENT OFFICE.

PHILIP THOMAS McNALLY, OF MANDAN, NORTH DAKOTA.

MECHANICAL MOVEMENT.

No. 922,316.

Specification of Letters Patent.

Patented May 18, 1909.

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To all whom it may concern:

Be it known that I, PHILIP T. McNALLY, a citizen of the United States, residing at Mandan, in the county of Morton and State of North Dakota, have invented a new and useful Improvement in Mechanical Movements, of which the following is a specification.

My invention is in the nature of a novel mechanical movement, for converting simple reciprocating motion into a modified reciprocating motion alternately in two different planes, for various uses in the arts, and it consists in the novel construction and arrangement of the stationary frame provided with guides for the reciprocating member, in combination with a shifting switch acting automatically to direct the movement, as will be hereinafter more fully described with reference to the drawing, in which—

Figure 1 is a front view, and Fig. 2 an edge view of the mechanical movement. Fig. 3 is a central longitudinal section, showing the position of parts for directing the reciprocating body into one plane of action. Fig. 3^a is a similar section, showing the position of parts for directing the reciprocating body into another plane of action. Fig. 4 is a cross section on line 4—4 of Fig. 1. Fig. 5 is a longitudinal section on line 5—5 of Fig. 1 and Fig. 6 is a sectional detail of the automatic shifting switch.

In the drawing, A B B represent a stationary main frame with its guides, C is the shifting switch, and E is the reciprocating member whose plane of reciprocation is directed alternately into the two paths of the guide slots *h* and *h'*.

The main frame is composed of a central piece A made wedge-shaped at one end and supported exclusively at the other end by screws *s s* which connect it detachably between the two legs B B of the outer frame portion. The central piece A is recessed on each side so as to form, between its sides and the outer frame, slots *h h'* which at their lower ends converge and merge into the single guide slot *r* which preferably bisects the angle of convergence of the slots *h* and *h'* equally, and, as shown, the slots *h* and *h'* are parallel and the plane of the slot *r* is parallel to the slots *h* and *h'* and if extended the plane of slot *r* would be equidistant from the slots *h* and *h'*.

The shifting switch C consists of a triangular metal block inserted in a slot in the wedge shaped end of the piece A and pivotally connected thereto by a pin *g*. Within a recess in one apex of the switch block C is pivoted upon its pin *g* a symmetrically formed switch tongue *c* which is maintained normally in a line bisecting the apex of the switch by two yielding fingers *a a'*, one on each side of the tongue and bearing against it in opposite directions. The upper ends of these yielding fingers are pivoted in the recess of the switch block and the two fingers are drawn together by the tension of an interposed spiral spring *i* which through the fingers *a a'* exerts an equal pressure upon opposite sides of the spring tongue *c* which holds it straight and true, but allows it to yield in either direction.

The switch block C is capable of tilting on its center *g*, so as to cause its two upper corners to alternately extend across the guide slots *h* and *h'* and partially blockade the same. When the upper corner of the switch block lies across the guide slot *h*, as seen in Fig. 3 then the yielding switch tongue *c* will be thrown across the other guide slot *h'* just at the point where the two slots *h h'* converge into the slot *r*. In like manner when the switch block is tilted in the other direction, as in Fig. 3^a, so that its other upper corner lies across slot *h'*, slot *h* will be opened above and will be closed below by the tongue *c*.

The two positions to which the switch block C may be thrown are maintained by a brake or yielding detent, consisting of an elastic cross-head *j* mounted on the end of a yielding stem *d*, sliding longitudinally in a central hole in the piece A and forced downwardly by a spiral spring *u* arranged behind the stem. The upper corners of the switch block are formed with notches *n n* and when the switch block is turned, it forces the spring cross-head *j* and its stem *d* back until the rounded portion of one end of the cross-head drops into a notch *n* and thus fixes and holds the switch block in the position to which it may be thrown, until forcibly made to change its position again. When sufficient force is applied to the switch block in the opposite direction its notch *n*, pressing back the rounded end

of the cross-head, causes the stem *d* to yield backward and let the notch pass and as the switch goes to the limit of its shifting movement its other notch *n* receives the other end of the cross-head *j* and is thereby held to this position, until forcibly turned back again.

I will now describe the manner in which my invention is made effective for converting a simple reciprocating motion into an alternating reciprocating motion, first in one and then in the other of two different planes.

Assuming that the pin *E* is the reciprocating traveler whose path is to be changed first into one plane and then into another, when the pin *E* rises and the switch is in the position shown in Fig. 3, it finds the tongue *c* lying across the entrance to the slot *h'*. The pin *E* therefore in rising passes into the slot *h* across which the right hand upper corner of the switch block is at this time lying. Said pin therefore strikes this corner of the switch block and tilts it and its yielding tongue into the dotted position in Fig. 3 and full line position of Fig. 3^a. When the pin *E* descends it strikes the spring tongue *c* and, as this yields to the left, the pin passes by the same and down into the slot *r*. Now on the next ascent of the pin *E* it finds the switch in the position of Fig. 3^a and as the pin rises its entrance to slot *h* is blocked by the spring tongue *c* and said pin is therefore compelled to pass up the other slot *h'*. As it rises therein it finds the left hand corner of the switch block lying across the slot *h'*, and, striking the same, shifts the switch on its center to the full line position of Fig. 3 again. It will thus be seen that the simple reciprocation of pin *E*, as actuated by any prime mover or part of a machine, causes it with my devices to alternately enter first one, and then the other of the two paths *h* and *h'*. As shown these paths are parallel, but it is obvious that they need not be so, but may be extended in any divergent direction from the slot *r*.

In the edges of the device are formed slots *t*. These are designed to give passage to any two lever ends, pins, or other parts to which it may be desired to transmit motion alternately. The ends of two such devices in such case simply protrude through the slots *t* into the path of the reciprocating member *E*, which alternately acts first upon the device on one side and then upon the device on the other side. To render this more clear, I have shown in Fig. 1, in dotted lines, a lever 1 fulcrumed in the middle and having at its ends pull rods 2 and 4 with in-turned ends 3 and 5, which extend through the slots *t* into the path of the reciprocating member *E*, the ends 3 and 5 being alternately lifted by said member *E*. My device may be advantageously applied to the oper-

ation of electric switches and in various other arts where an alternate action is desired.

I claim:

1. A means for converting simple reciprocating motion into separate alternate reciprocations in different planes, comprising a stationary frame with stationary guides forming two paths merging into a single path at one end, a pivoted switch arranged at the point of merger, and a reciprocating member arranged to alternately turn the switch in opposite directions.

2. A means for converting simple reciprocating motion into separate alternate reciprocations in different planes, comprising a stationary frame with guides forming two paths merging into one another at one end, a pivoted switch arranged at the point of merger and having a tongue yielding in both directions, and a reciprocating member arranged to alternately turn the switch in opposite directions.

3. A means for converting simple reciprocating motion into separate alternate reciprocations in different planes, comprising a stationary frame with guides forming two paths merging into one another at one end, a pivoted switch arranged at the point of merger and having a tongue yielding in both directions, means for holding the switch in its adjusted positions, and a reciprocating member arranged to alternately turn the switch in opposite directions.

4. A means for converting simple reciprocating motion into separate alternate reciprocations in different planes, comprising a frame with guides forming two paths merging into one another at one end, a pivoted switch arranged at the point of merger and having a pivoted tongue arranged to be thrown alternately across the inlet ends of the paths, spring pressed fingers arranged on opposite sides of the tongue, and a reciprocating member arranged to alternately turn the switch in opposite directions.

5. A means for converting simple reciprocating motion into separate alternate reciprocations in different planes, comprising a stationary frame with guides forming two paths merging into one another at one end, a pivoted switch arranged at the point of merger and having notches at two of its corners, a centrally placed and yielding stem with cross head bearing upon the switch and adapted to lock alternately into its notches and a reciprocating member arranged to alternately turn the switch in opposite directions.

6. A means for converting simple reciprocating motion into separate alternate reciprocations in different planes, comprising a frame with guides forming two paths merging into one another at one end, a pivoted switch arranged at the point of merger and

having notches at two of its corners, a centrally placed and yielding stem with cross head bearing upon the switch and adapted to lock alternately into its notches, a resilient tongue for the switch adapted to alternately close the entrances of the two paths, and a reciprocating member arranged to alternately turn the switch in opposite directions.

7. A means for converting simple reciprocating motion into separate reciprocations in different planes, comprising a stationary frame with stationary guides forming two paths merging into a single path at one end, and having slots in the outer guide members at right angles to said guides to permit the protrusion into each of the two paths of any objects to be alternately acted upon, a pivoted switch with flexible tongue, arranged at the point of merger, and a reciprocating member to alternately turn the switch in opposite directions.

8. A means for converting simple reciprocating motion into separate alternate reciprocations in different planes, comprising a stationary frame with stationary guides forming two paths merging into a single path at one end, a pivoted switch arranged at the point of merger and having a tongue yielding in both directions, and a reciprocating member arranged to alternately turn the switch in opposite directions.

9. A means for converting simple reciprocating motion into alternate reciprocations in different planes, comprising a stationary frame with stationary guides forming two paths merging into a single path at one end, a pivoted switch arranged at the point of merger and having a tongue yielding in both directions, means for holding the switch in its adjusted positions, and a reciprocating member arranged to alternately turn the switch in opposite directions.

10. A means for converting simple reciprocating motion into separate alternate reciprocations in different planes, comprising a stationary frame with stationary guides forming two paths merging into a single path at one end, a pivoted switch arranged at the point of merger and having a pivoted tongue arranged to be thrown alternately across the inlet ends of the two paths, spring pressed

fingers arranged on opposite sides of the tongue, and a reciprocating member arranged to alternately turn the switch in opposite directions.

11. A means for converting simple reciprocating motion into separate alternate reciprocations in different planes, comprising a stationary frame with stationary guides forming two paths merging into a single path at one end, a pivoted switch arranged at the point of merger and having notches at two of its corners, a centrally placed and yielding stem with cross-head bearing upon the switch and adapted to lock alternately into its notches, and a reciprocating member arranged to alternately turn the switch in opposite directions.

12. A means for converting simple reciprocating motion into alternate reciprocations in different planes, comprising a stationary frame with stationary guides forming two paths merging into a single path at one end, a pivoted switch arranged at the point of merger and having notches at two of its corners, a centrally placed and yielding stem with cross-head bearing upon the switch and adapted to lock alternately into its notches, a resilient tongue for the switch adapted to alternately close the entrances to the two paths, and a reciprocating member arranged to alternately turn the switch in opposite directions.

13. A means for converting simple reciprocating motion into separate reciprocations in different planes, comprising a stationary frame provided with stationary slotted guides forming two paths merging into a single path at one end, a movable member adapted to reciprocate alternately in each of said paths, arms arranged to project through the slots of said guide members and adapted to be engaged by said movable member, and a pivoted switch arranged at the point of merger of said paths and engaged by said movable member for effecting the alternate movement.

PHILIP THOMAS McNALLY.

Witnesses:

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C. L. TIMMERMAN.