No. 778,856. PATENTED JAN. 3, 1905.

P. GOLDMANN.

MECHANICAL MOVEMENT.

APPLICATION FILED FEB. 20, 1904.

3 SHEETS—SHEET 1.

Fig. 1.

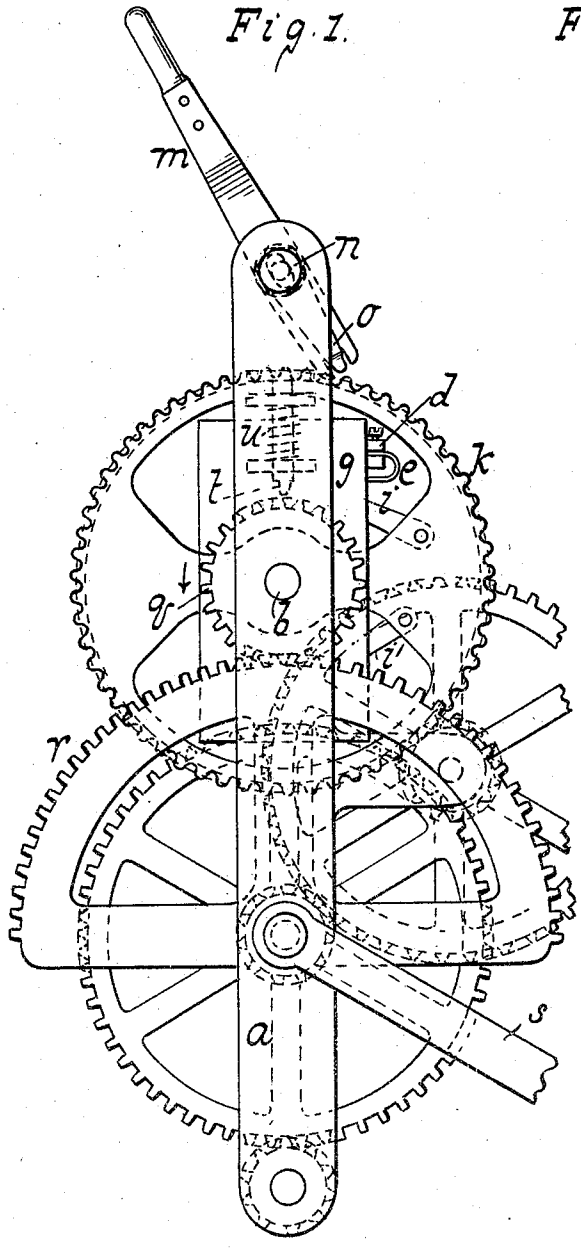
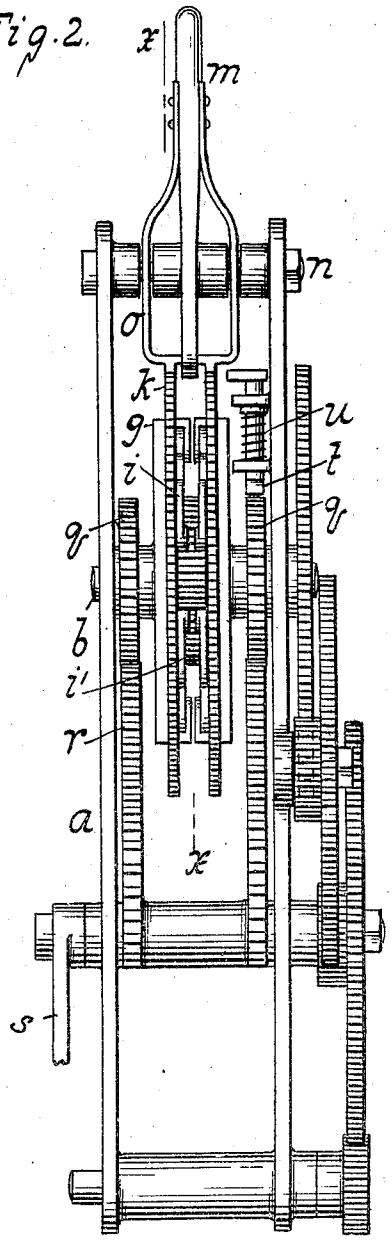



Fig. 2.




WITNESSES:

William Miller

George Hentsberg

INVENTOR

Philipp Goldmann

BY

W. C. Hauff

ATTORNEY

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3 SHEETS—SHEET 2.

Fig. 3.

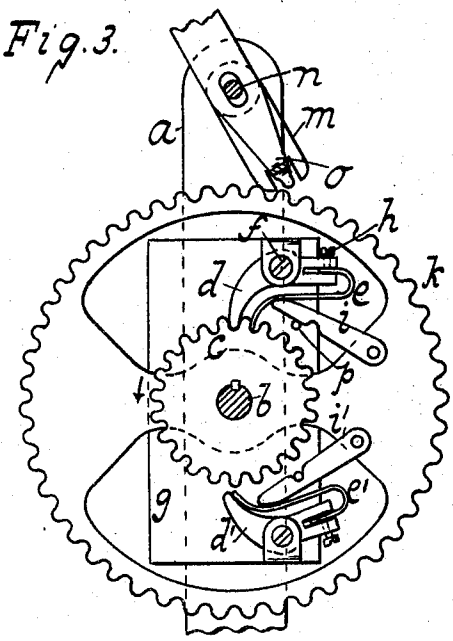



Fig. 4.

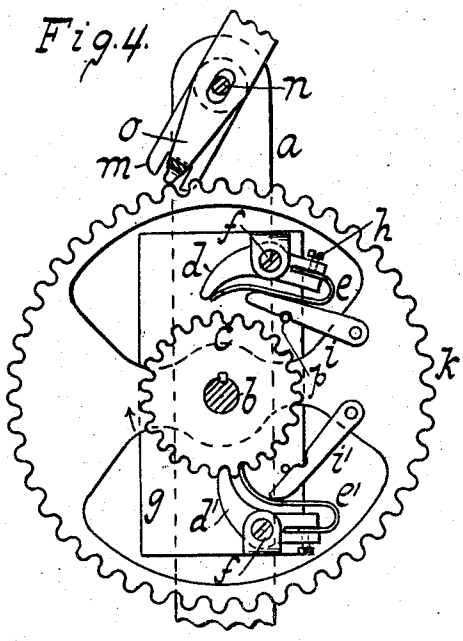



Fig. 5.

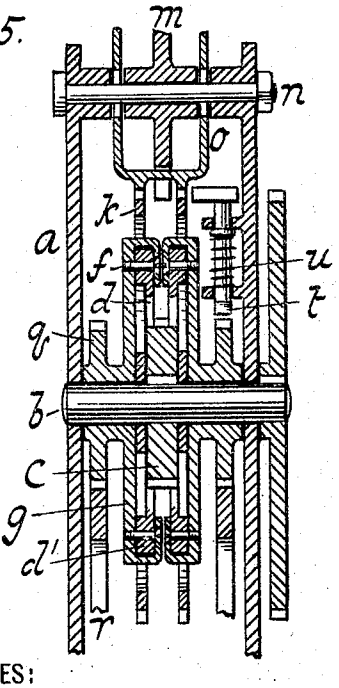
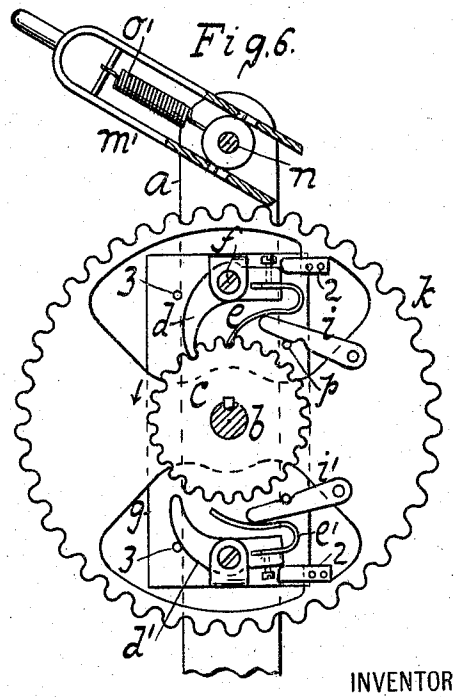



Fig. 6.




WITNESSES:

William Miller

George Heilsberg

INVENTOR

Philipp Goldmann

BY W. C. Hauff

ATTORNEY

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3 SHEETS—SHEET 3.

Fig. 7.

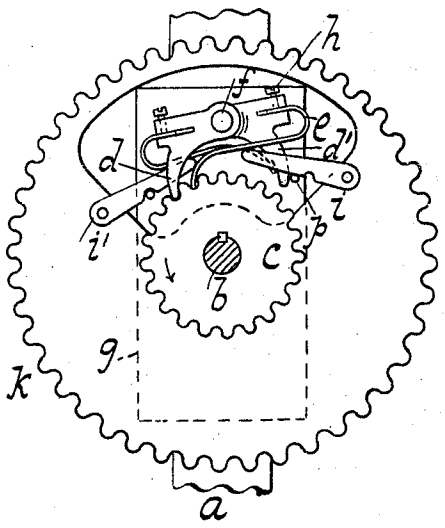



Fig. 9.

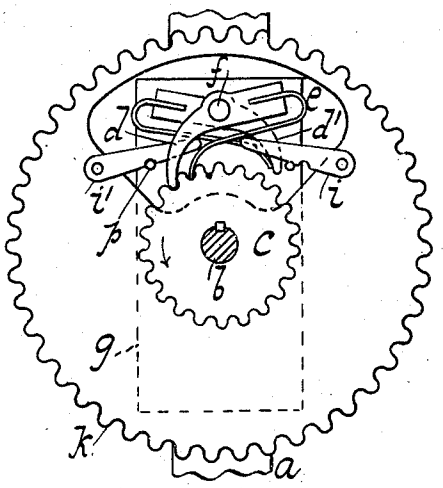



Fig. 8.

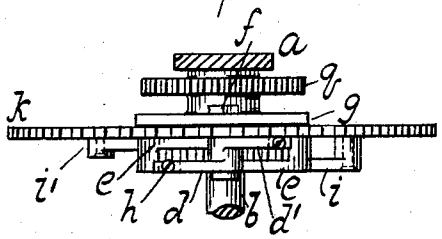



Fig. 10.

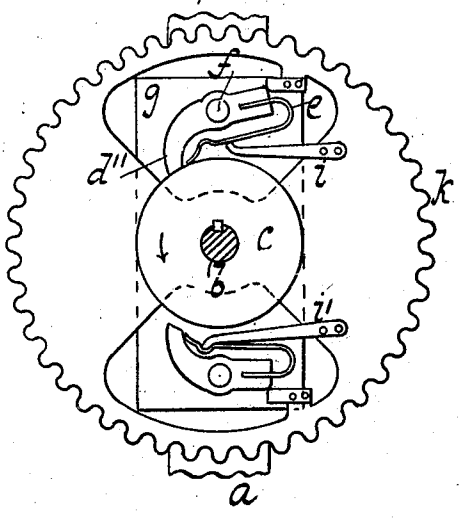



Fig. 11.

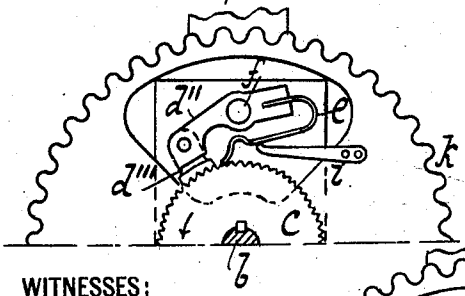
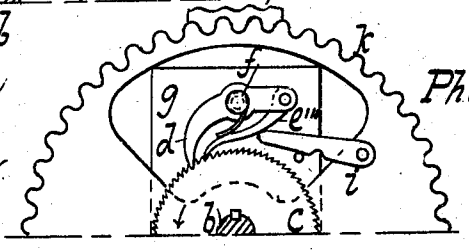



Fig. 12.




WITNESSES:

William Miller

George Kulsberg

INVENTOR

Philipp Goldmann

BY

W. C. Hauff

ATTORNEY

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No. 778,856. Patented January 3, 1905.

# UNITED STATES PATENT OFFICE.

PHILIPP GOLDMANN, OF NEW YORK, N. Y.

## MECHANICAL MOVEMENT.

SPECIFICATION forming part of Letters Patent No. 778,856, dated January 3, 1905.

Application filed February 20, 1904. Serial No. 194,506.

*To all whom it may concern:*

Be it known that I, PHILIPP GOLDMANN, a citizen of the United States, residing at New York city, in the county and State of New York, have invented new and useful Improvements in Mechanical Movements, of which the following is a specification.

This invention relates to a mechanical movement or to means for converting motion. The power transmitted can be utilized as seen fit—for example, to drive sewing-machines, vehicles, cutters, or other devices.

This invention is set forth in the following specification and claims and illustrated in the annexed drawings, in which—

Figure 1 is a side elevation of a mechanical movement embodying this invention. Fig. 2 is an edge view of Fig. 1. Fig. 3 is a section along *x x*, Fig. 2. Fig. 4 is a view like Fig. 3 with parts in a different position. Fig. 5 is a sectional edge view of Fig. 4. Fig. 6 shows a modification. Figs. 7 to 12 show modifications.

In the drawings is shown a frame or bearing part *a*. The shaft *b* can be rotated by a wheel or gear *c*, fixed thereto and driven by a pawl or clutch *d*. This driving tooth or clutch *d* has an arm or rather spring *e*, made to engage the wheel to move the tooth to engagement therewith. The tooth is pivoted at *f* to a carrier *g*. The spring *e* is shown secured to the tail part of the tooth, and a screw *h* can be applied to enable the spring to be adjusted and fixed as required or to compensate for wear. If the carrier swings or oscillates in the direction opposite to that of the arrow, Fig. 3, the tooth and spring in the position of parts shown slip or move idly over the wheel. When moving in the direction of said arrow, the free end of the spring catches or strikes against the wheel or a tooth, and by such catching or friction the pawl is swung to cause its tooth or clutch end to take hold of and turn the wheel. The carrier is shown loose on shaft *b*, so as to move or swing independently thereof. The rotation of wheel *c*, communicated to shaft *b*, can be applied as required.

It is seen that the pawl *d* and spring-arm *e* both directly engage the wheel when moving in the direction of the arrow, Fig. 3. The spring, having its free end pressed against the wheel, causes the pawl to swing about its pivot to clutch or engage the wheel. A release can also be provided. When the pawl and spring are to be put out of action or held clear from the wheel, the finger or release *i* is moved therebetween. The spring and pawl are thus kept from contact with the wheel, Fig. 4. Another pawl and spring are shown at *d'* and *e'*. They may be called a "reverse actuator" or "driver," as they rotate the wheel when in engagement therewith in the opposite direction to that imparted by the first-named pawl.

A release *i'* is shown for the reverse-pawl. The releases *i* and *i'* can be made to act alternately, so that when one pawl is moved clear the other acts, and contrariwise. Means are thus provided for reversing, so that, for example, a vehicle or a driving or balance wheel or other appliance can be driven forward or back, as required.

In the drawings are shown two pair of pawls—that is, two pawls and two reverse-pawls; but the above description explains the respective actions.

The fingers or releases *i i'* are mounted or pivoted on a disk *k*, having teeth adapted to be engaged by lever or handle *m* on fulcrum *n*. When the lever is swung one way or another, the disk *k* is shifted to move the fingers *i i'*, so that one pawl and spring is moved or held clear, while the other is allowed to engage the wheel *c*.

In Figs. 3 and 4 the reverse positions are shown, so as to illustrate driving in opposite directions.

The setting or reversing handle *m* is shown with a bow-spring or a yielding part *o*, which if striking onto a tooth of setter *k* instead of between such teeth will yield to avoid breakage.

The lever *m'* of Fig. 6 is held yieldingly toward the setting-disk *k* by spring *o'*, so as also to yield if striking onto the tooth.

To prevent accidental shift of the fingers *i* or *i'*, a lock, such as a pin *p*, entering a re-

cess in the fingers, can be provided. The pin *p* being fixed to the carrier *g* and a finger when coming into action moving its catch or recess part to such pin, the fingers or its disk *k* will be held from accidentally shifting.

The carrier or arm *g* is oscillated by suitable means. A transmission-gear is shown at *q*, cast or secured to the carrier and oscillating with the same about the shaft *b*. A gear-segment is shown at *r*, actuated by handle or pedal or other means, (indicated at *s;*) but manifestly other means for oscillating the pawls can be employed.

The reversing-lever *m* in addition to shifting disk *k* can also actuate a lock *t*, Fig. 2. This lock, as shown, consists of a plunger normally held clear by spring *u*, but moved to temporarily engage a gear *q* as the lever *m* swings from one position to another. In Figs. 1 and 2 when the lever *m* stands in upright position and presses plunger-tooth *t* to wheel *q* the latter is held or locked against rotation until lever *m* has passed or swung on beyond vertical position. During such shift the gear *q* and carrier *g* are thus held stationary. The fingers *i i'* can be either pivoted to disk *k*, as in Fig. 3, or fixed thereto, as in Figs. 10 and 11.

The pawls *d d'* can be mounted on separate pivots, as in Fig. 3, or on a common pivot, as in Figs. 7 and 8. In Fig. 7 the pawl-teeth are shown formed of one piece of metal or material, while in Fig. 9 two pieces are on a common pivot.

The part *d* instead of being a tooth or pawl can be a clutch, as shown at *d''*, Fig. 10 or Fig. 11. The clutch of Fig. 11 consists of a clutch or tooth part *d'''*, pivoted to part *d''*.

The finger *i* instead of catching on a pin, as in Fig. 3, could be caught in a shoulder or bent part in the spring *e*, Figs. 10 and 11.

As regards the lock *t*, the same can be omitted in certain cases—as, for example, in a vehicle—as the weight of the latter would hold parts stationary during reversing; but such lock can be employed when needed.

The pivot *f* of the pawl, as seen in Fig. 5, is preferably provided with a bearing for each end to prevent skewing or breaking.

The action of the spring *e* is such that by the pressure or thrust of the spring against the wheel *c* on the forward motion of the pawl the latter is moved or pressed to firm engagement with the wheel; but on the return stroke of the pawl it is lifted clear by the spring gliding or slipping over the wheel. The noise of ratcheting back is thus to a great extent, if not altogether, avoided. The spring presses the pawl into engagement by the direct engagement and thrust of the spring against the wheel, so that the spring presses and holds the pawl to firm engagement with the wheel, and the stronger the thrust of the spring against the wheel the more firmly or securely will the pawl be pressed or held in engagement irrespective of the location of the pawl with respect to the circumference of the wheel.

In addition to having a finger *i* to clear the spring the disk *k* may have a block 2, Fig. 6, for engaging the heel of the pawl to aid in holding the latter clear.

The gear teeth or wheel *c* act on the plan of ratchet-teeth in connection with either the pawl *d* or *d'*. The pawls are so arranged as to slip in one direction, but to take hold of the wheel when moving in another direction. Two ratchet-wheels—one for each pawl—have been tried in the course of experimenting; but the wheel *c*, engaged by one or another of the oppositely-acting pawls, is preferred. The construction shown is satisfactory, and its action is quick and reliable and practically free from lost motion.

The gear *c* can be made of any desired size to secure faster or slower movement. A stop 3, Fig. 6, can also be provided to prevent the pawl when clear from swinging or moving too far from the wheel.

The disks *k* can either be mounted loosely about shaft *b* or have pin-and-slot connections with carrier *g* to have sufficient play for setting the releases *i i'* and be out of contact or free from friction with wheel *c*.

In Fig. 12 instead of a spring, as *e* in Fig. 3, is shown an arm *e''*, pivoted to the pawl *d* and pressed by spring *e'''* toward the wheel *c*. This arm acting together with the pawl secures a firm engagement to rotate the wheel *c* and is in position to instantly move the wheel forward.

What I claim as my invention, and desire to secure by Letters Patent, is—

1. A wheel and a driving-tooth, combined with a spring made to directly engage the wheel to move the tooth to engagement.

2. A wheel with a driving-tooth and a spring secured to the tooth and made to directly engage the wheel, said tooth and spring being adapted to slip on the wheel in one direction, and said spring when moving in the other direction being made to engage the wheel to move the tooth into engagement therewith.

3. A wheel combined with a driving-tooth and a spring, said tooth and arm being made to slip over the wheel in one direction and to both directly engage the wheel when moving in the opposite direction so that the spring will release the tooth as well as move it to engagement.

4. A wheel, a driving-tooth therefor, an arm made to directly contact with the wheel to move the tooth to engagement, and a release for holding the spring and tooth out of action.

5. A wheel, a tooth and a spring for a wheel, a release for holding the tooth and spring clear or out of engagement, there being locking or

holding point for preventing accidental shift of the release.

6. A wheel, a tooth and spring therefor, a release for the tooth and spring, a shifter for the release, and a lock or holding-stud, said release having shoulder or engaging parts to coact with the lock.

7. A wheel, a tooth and spring therefor, a release to hold the tooth and spring from the wheel, and a shifter to which the release is connected, said spring being located between the tooth and wheel and said tooth being freely mounted to be lifted clear when the release acts against the spring.

8. A wheel, a tooth and a spring therefor, a release for the spring and tooth, a disk to which the release is connected and a handle for shifting the disk.

9. A wheel, a tooth and spring made to engage the wheel, a carrier on which the tooth and spring are mounted, a release for the tooth and spring, and a lock or pin for the release mounted on the carrier.

10. A wheel, a tooth and spring made to directly engage the wheel, a carrying-arm for the tooth, a transmission-wheel secured to the arm, and means for actuating the transmission-wheel.

11. A wheel and a driving-tooth therefor, combined with an arm, a reversing mechanism, and a lock actuated by said mechanism.

12. A wheel and oppositely-acting teeth therefor, combined with a reverser for moving one tooth out of action while allowing the other to come into action, and a lock for the wheel to hold the latter during the reverse.

13. A driven wheel and oppositely-acting teeth therefor, a carrying-arm for the clutches, a transmission wheel and actuator for the arm, a reversing handle or device for the clutches, and a lock actuated by the reverser and made to hold the wheel during reversing.

14. A driven wheel and oppositely-acting teeth therefor, means for actuating the teeth, a reversing-disk for shifting the clutches alternately into and out of action, a swinging handle for the reversing-disks, and a lock for the wheel actuated by the handle as it is swung.

15. A wheel, a tooth and spring made to directly engage the wheel, a transmission-wheel for actuating the tooth and spring to rotate the first-named wheel, and means for actuating the transmission-wheel.

16. A wheel combined with a driving-tooth and a spring both made to engage the wheel, and the spring tending to hold or press the tooth away from the wheel, the spring when moving forward engaging the wheel to move the tooth to engagement and when returning being made to glide or slip over the wheel to lift the tooth clear.

17. An oscillating carrier, a wheel, oppositely-acting teeth driven by the carrier, springs attached to the teeth so as to directly engage the wheel, a release for the teeth, and a handle for setting the release.

18. An oscillating carrier, a wheel, oppositely-acting teeth and springs both made to directly engage the wheel and driven by the carrier, releases for the teeth, a disk on which the releases are mounted, and a handle for setting the disk irrespective of the position of the teeth.

In testimony whereof I have hereunto set my hand in the presence of two subscribing witnesses.

PHILIPP GOLDMANN.

Witnesses:
CHAS. E. POENSGEN,
GEORGE HULSBERG.