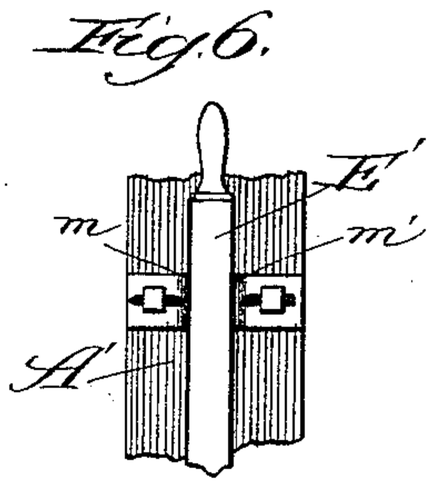
(No Model.)

J. T. HOSTLER.

INTERMITTENT GRIP.

No. 414,114. Patented Oct. 29, 1889.

Fig. 6.



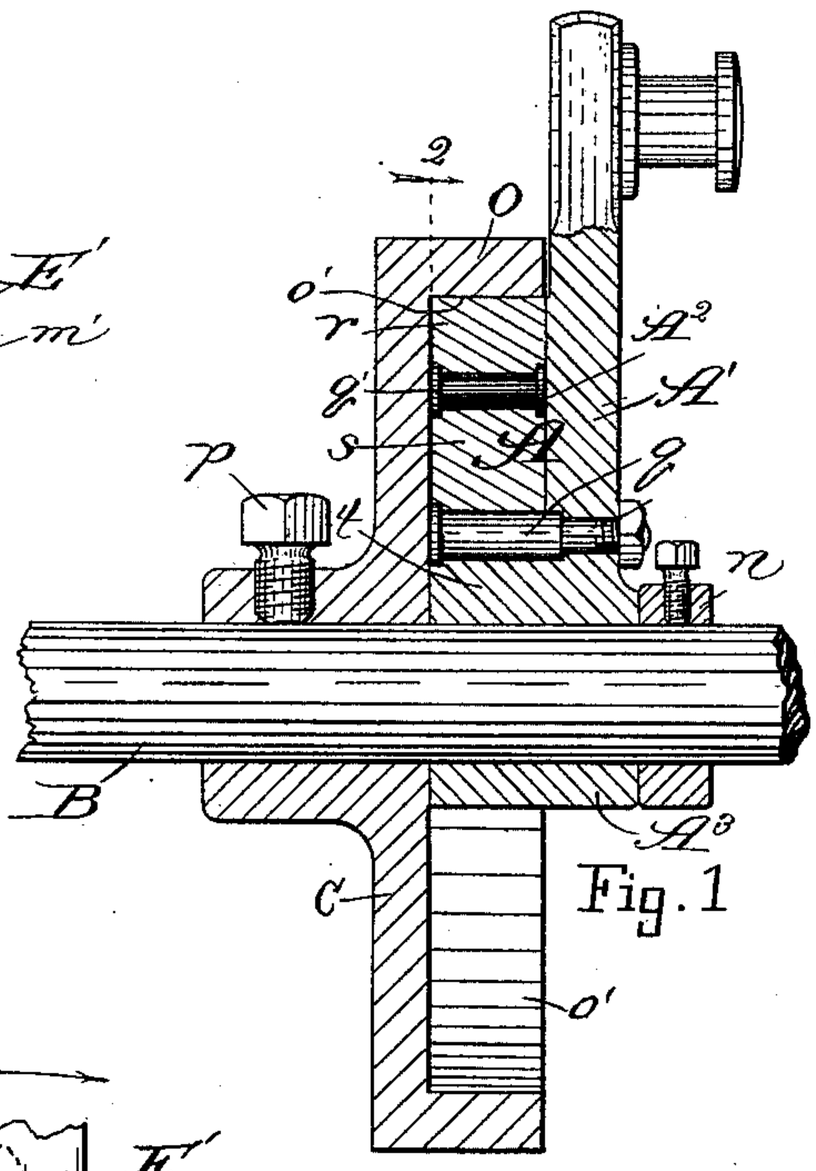
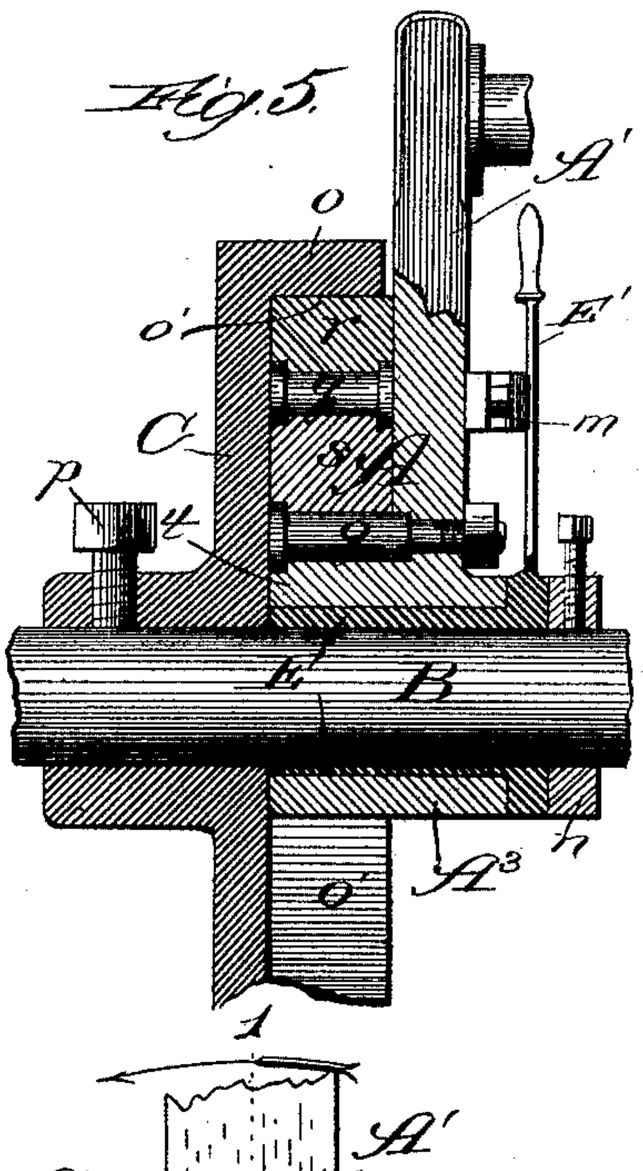


Fig. 1

Fig. 5.



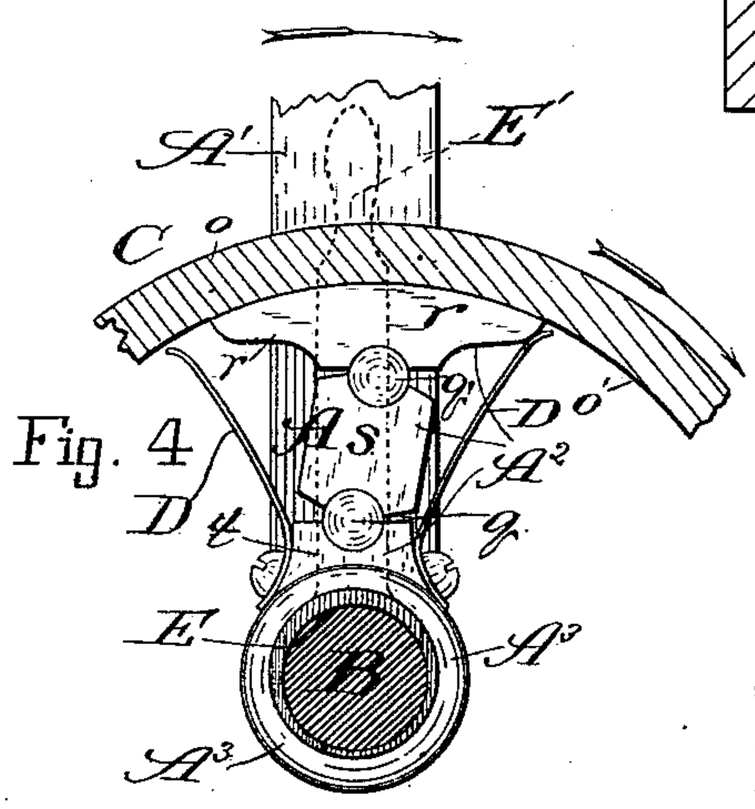


Fig. 4

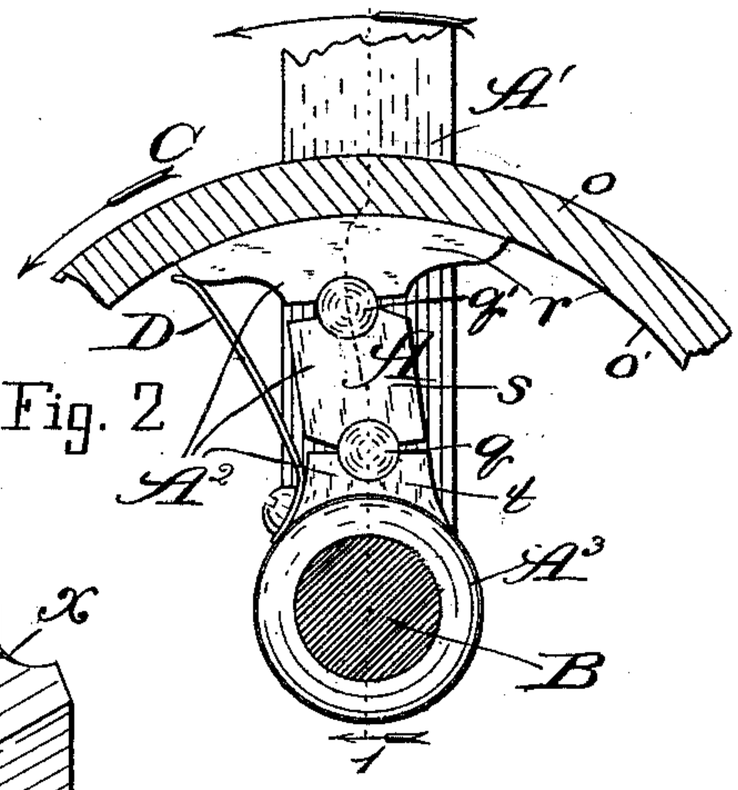


Fig. 2

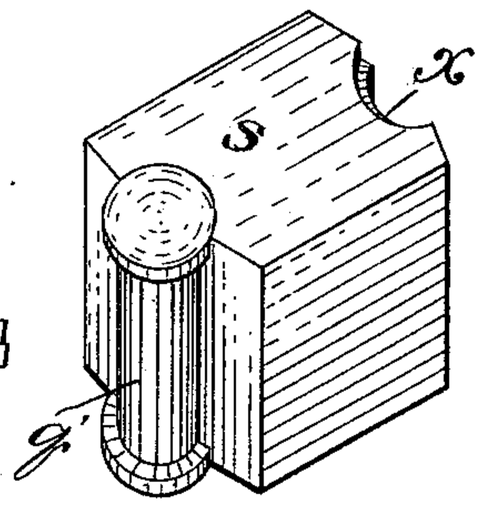


Fig. 3

Witnesses.
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UNITED STATES PATENT OFFICE.

JOHN THOMAS HOSTLER, OF KALAMAZOO, MICHIGAN.

INTERMITTENT GRIP.

SPECIFICATION forming part of Letters Patent No. 414,114, dated October 29, 1889.

Application filed February 25, 1889. Serial No. 301,006. (No model.)

To all whom it may concern:

Be it known that I, JOHN THOMAS HOSTLER, a citizen of the United States, residing at Kalamazoo, in the county of Kalamazoo and State of Michigan, have invented a new and useful Improvement in Intermittent Grips, of which the following is a specification.

The object of my invention is to provide an intermittent-grip device of improved construction for use in converting oscillatory into rotary motion; and to this end my invention consists in the general construction of my improved device; and it further consists in details of construction and combinations of parts hereinafter set forth and claimed.

In the drawings, Figure 1 illustrates my improved device in broken sectional elevation, the section being taken on the line 1 1 of Fig. 2 and viewed in the direction of the arrows. Fig. 2 is a broken partly-sectional view of the same, taken on the line 2 of Fig. 1 and viewed in the direction of the arrow; Fig. 3, an enlarged perspective detail view; Fig. 4, a view similar to that shown in Fig. 2, but illustrating a modified construction; Fig. 5, a view similar to that shown in Fig. 1 and illustrating the modified construction shown in Fig. 4, and Fig. 6 a broken view in elevation showing a detail.

A is a lever having as integral parts an arm A′, a collar or sleeve portion A^3, fitting loosely over a shaft B, a rigid spring-finger D, and a projection *t*, forming the inner section of a jointed arm A^2. The arm A^2 comprises, besides the inner section *t*, an intermediate section or block *s* and an outer section or shoe *r*, the abutting ends of the sections being provided with concave socket-bearings *x*, as shown in Fig. 3, to receive intervening rollers or pins *q q′*, which prevent lateral displacement of the sections *s* and *r* when adjusted in operative position, as hereinafter described.

C is a wheel upon the shaft B, to which it may be rigidly secured by means of a set-screw *p*. The wheel C is provided with an annular flange *o*, having an inner friction-surface *o′*.

The jointed arm A^2 of the lever A abuts against the flanged face of the wheel C, as shown, the whole lever being held in place by a collar *n* upon the shaft, and the outer face of the shoe *r* is curved to conform to the inner surface of the annular flange *o*. The jointed arm A^2 must be adjusted in such a manner as to cause it always to incline slightly more or less out of a direct radial line, and the direction of its inclination is the direction in which it must be moved to rotate the wheel C. Thus, when adjusted as shown in Fig. 2, the jointed arm will engage the flange *o* when it is moved by the oscillation of the arm A′ in the positive direction, or direction of the arrow, and when thus moved it will become rigid, and with continued movement it will rotate the wheel in the same direction as indicated. When by the oscillation of the arm A′ it is moved in the opposite direction, the arm A^2 will relax and disengage the surface *o′*, all as hereinafter more fully described.

The spring-finger D is secured toward one end to the sleeve A^3, and extends toward its opposite end into contact with the shoe *r* on the side of the latter toward which the jointed arm inclines, and it operates to maintain the shoe against displacement, and always in contact with the surface *o′*, to facilitate engagement with the latter of the shoe when the arm A′ is oscillated in a positive direction, as hereinafter described.

In operation power is applied to the arm A′ to oscillate it and its integral and fixed parts—namely, the sleeve A^3, section *t*, and spring-finger D. With each oscillation of the arm A′ in the positive direction the roller *q* is turned toward direct radial line with the roller *q′*, which action tends to straighten the arm A^2 and press the shoe against the surface *o′*. As the jointed arm is incapable (owing, of course, to the contracted limits of the space between the shaft and flange *o*) of extending into direct radial line, oscillation of the arm A′ in the direction opposite to that stated above will cause the arm A^2 to resume its initial relaxed condition, and thereby release the surface *o′*, to engage it again when the progressive or positive impulse is repeated.

If the surface *o′* and adjacent surface of the shoe were roughened sufficiently, the part D could be of rigid instead of springy quality; or when the parts are so situated with relation to each other (for instance, in-

verted with reference to the position shown) that gravity would cause the shoe to engage the surface *o'* with each positive movement of the arm A' the part D could be dispensed with. The preferred construction is that shown, however, wherein the surfaces of the shoe and flange are as smooth as it is possible to make them, while the spring D bears against the shoe with sufficient force to cause instantaneous engagement thereby of the surface *o'* when it is moved in the positive direction without materially affecting, owing to the smoothness of the surfaces, as aforesaid, the movement of the flange against the shoe or shoe against the flange when the arm A^2 is relaxed.

My device performs the function commonly performed by the pawl and ratchet; but, unlike the latter, it is practically noiseless in its operation, and is capable of being operated with less lost motion than is necessarily occasioned in causing the pawl to engage a tooth of the ratchet. The movement may be employed in the same connections as the pawl and ratchet, and, like the latter, may be used to revolve intermittingly bodies offering great resistance or continuously those offering a less resistance.

It is not necessary that the wheel C should be fixed upon the shaft B unless it is desired that the latter itself should revolve, so that a collar upon the shaft may be employed to hold the wheel loosely in position instead of using the set-screw *p*. While I prefer to employ the rollers or pins *q q'* to afford the necessary flexible joints between the sections of the arm A^2, any other connecting means which will operate in substantially the same manner may be substituted, and I do not limit myself to the construction shown. Moreover, the rollers or pins may be either loose or they may be rigid with one or the other of the blocks.

The device thus far described is capable of exerting power only in one direction. Figs. 4 and 5, however, show a modified construction, in which the jointed arm A^2 is capable of being adjusted to incline toward and therefore exert force in either direction. In the construction referred to the sleeve A^3, instead of fitting directly over the shaft B, surrounds an eccentric-sleeve E, which intervenes, as shown, between the sleeve A^3 and the shaft, and is provided with a handle E'. Turning of the eccentric-sleeve E will operate to increase or diminish the distance to which the jointed arm will extend from the shaft, and it is so arranged that when its greatest thickness is caused to intervene between the shaft and the side of the sleeve carrying the projection or section *t* the jointed arm will extend a distance which will cause the shoe *r* to engage at an inclination the flange *o* when operated as before described, while when the narrower part of the eccentric-sleeve intervenes at that point the section *t* is drawn toward the shaft to increase the distance between the former and the flange *o*, whereby the arm A^2 may be straightened out into direct radial line without crowding the shoe against the flange *o*. The handle E' extends from the eccentric-sleeve in a direction which, when the greatest thickness of the latter intervenes, as aforesaid, to project the arm A^2 toward the flange *o*, will cause the handle to extend longitudinally of the arm A', and a projection *m* upon the said arm A' is provided with a notch *m'* for the handle E', which has some elasticity, to spring into and become locked when brought coincident therewith. The modified construction may be adjusted to change the direction in which the power of the lever is exerted by springing the handle E' out of the notch *m'* and swinging it to turn the eccentric-sleeve E and relax the arm A^2, when the latter may be inclined over to the opposite side and the eccentric-sleeve and handle E' returned and locked in their initial positions, thus again distending the jointed arm.

Of course, in the modified construction two spring-fingers D are necessarily employed, as shown, to operate from either side of the arm A^2 in the manner described.

By having the eccentric-sleeve slightly thicker at its thickest part than is necessary to project the jointed arm into operative position and making the projection *m* adjustable right and left, as shown in Fig. 6, the normal position of the handle E' may be changed when desired to maintain a greater intervening thickness of the eccentric-sleeve between the shaft and arm A^2, so that any wear of the friction-surface *o'*, face of the shoe *r*, or other parts may be compensated for.

The figures of the drawings illustrate the arm A^2 in substantially vertical position. Such position, however, is not a necessary one, since it would be operative in any other position.

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

1. In an intermittent grip, the combination of a shaft, a lever fulcrumed on the shaft and having a rigid arm A', provided with a sleeve portion A^3, and a jointed arm A^2, extending out of direct radial line from the shaft, comprising an inner section *t*, integral with the sleeve A^3, a shoe *r*, and an intermediate block *s*, hinged at opposite extremities to the section *t* and shoe, and a wheel C, supported to encircle the jointed arm, whereby the oscillation of the rigid arm causes the shoe to engage the inner periphery of the wheel intermittently and rotate it in one direction, substantially as described.

2. In an intermittent grip, the combination of a shaft, a lever fulcrumed on the shaft and having a rigid arm A', provided with a sleeve portion A^3, and a jointed arm A^2, extending out of direct radial line from the shaft, comprising an inner section *t* integral with the sleeve A^3, a shoe *r*, and an intermediate block

s, hinged at opposite extremities to the section *t* and shoe, and a spring-finger D, rigid with the arm A′ and projecting normally into contact with the shoe on the side of the latter toward which the arm A^2 inclines, and a wheel C, supported to encircle the jointed arm, whereby the oscillation of the rigid arm causes the shoe to engage the inner periphery of the wheel intermittently and rotate it in one direction, substantially as set forth.

3. In an intermittent grip, the combination of a shaft B, a lever A, fulcrumed on the shaft and having a rigid arm A′ and a jointed arm A^2, carrying a shoe *r* and extending out of direct radial line from the shaft, a wheel C, supported to encircle the jointed arm, and shifting mechanism for retracting and advancing the shoe with relation to the inner periphery of the wheel, whereby the arm A^2 may be inclined at will to the opposite side of the radius, substantially as and for the purpose set forth.

4. In an intermittent grip, the combination of a shaft B, a lever A, fulcrumed on the shaft and having a rigid arm A′ and a jointed arm A^2, a wheel C, supported to encircle the jointed arm, and a sleeve E, surrounding the shaft eccentrically and confined between the said shaft and lever, whereby, by turning the eccentric-sleeve upon the shaft independently of the lever A, the jointed arm may be adjusted into and out of frictional contact with the inner surface of the wheel, substantially as and for the purpose set forth.

5. In an intermittent grip, the combination of a shaft B, a lever A, fulcrumed on the shaft and having a rigid arm A′ and a jointed arm A^2, a wheel C, supported to encircle the jointed arm, a sleeve E, surrounding the shaft eccentrically and confined between the said shaft and lever, a handle E′, connected with the eccentric-sleeve and projecting normally longitudinally of the arm A′, and a holder *m* upon the arm A′, to secure the handle in its normal position, whereby, by swinging the handle to turn the eccentric-sleeve upon the shaft independently of the lever A, the jointed arm may be adjusted into and out of frictional contact with the inner surface of the wheel, substantially as and for the purpose set forth.

6. In an intermittent grip, the combination of a shaft B, a lever A, fulcrumed on the shaft and having a rigid arm A′ and a jointed arm A^2, a wheel C, supported to encircle the jointed arm, a sleeve E, surrounding the shaft eccentrically and confined between the said shaft and lever, a handle E′, connected with the eccentric-sleeve and projecting normally longitudinally of the arm A′, and a holder *m* upon the arm A′, to secure the handle in its normal position and laterally adjustable thereon to change the normal position of the handle, whereby, by swinging the handle to turn the eccentric-sleeve upon the shaft independently of the lever A, the jointed arm may be adjusted into and out of frictional contact with the inner surface of the wheel, and by adjusting the holder *m* the said frictional contact may be increased or diminished, substantially as and for the purpose set forth.

JOHN THOMAS HOSTLER.

In presence of—
J. W. DYRENFORTH,
M. J. BOWERS.