

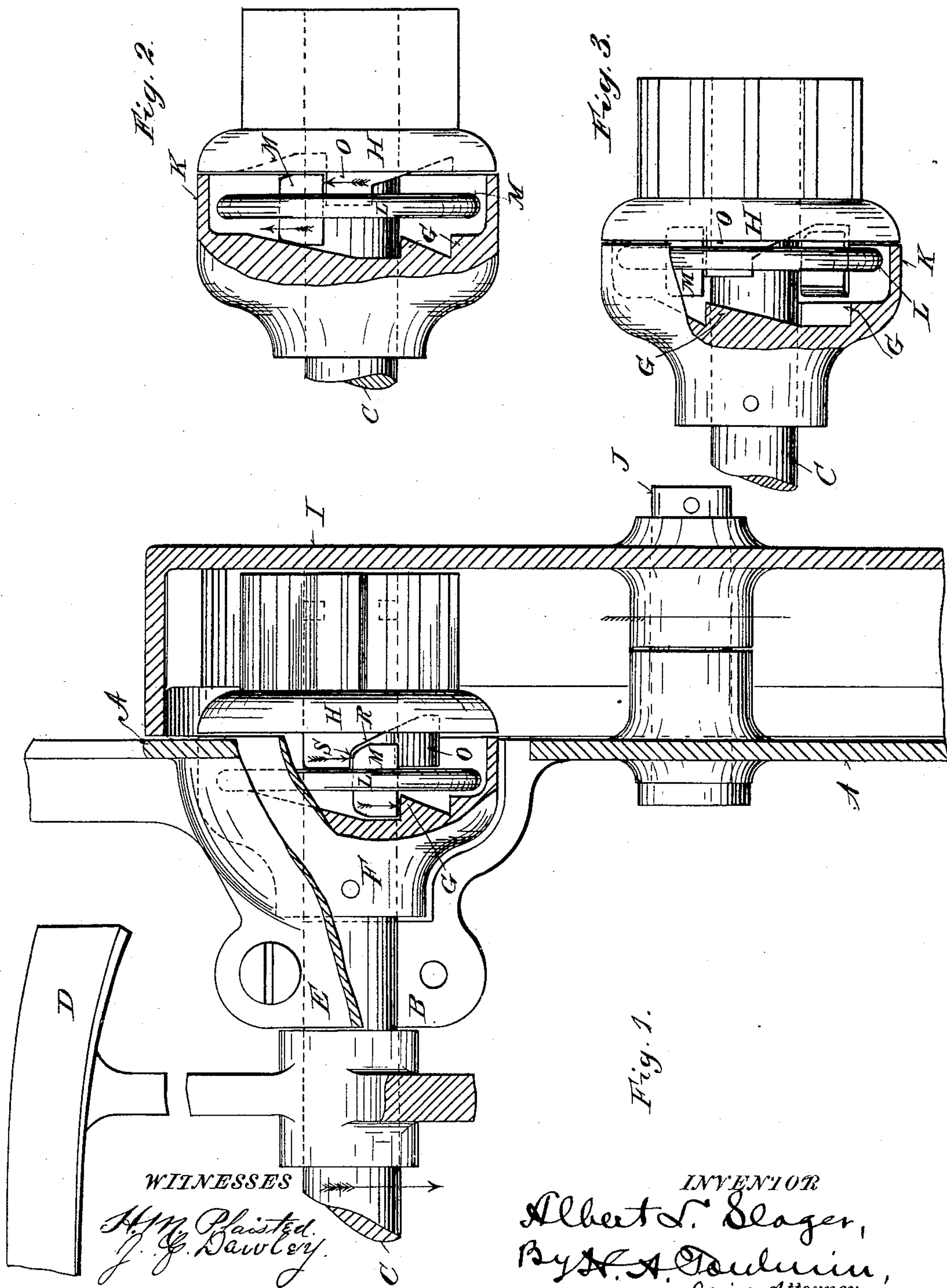
(Model.)

2 Sheets—Sheet 1.

A. L. SLAGER.
CLUTCH.

No. 480,748.

Patented Aug. 16, 1892.



WITNESSES

H. M. Plaisted.
J. G. Dawley.

INVENTOR

Albert L. Slager,
By H. A. Doulman,
his Attorney.

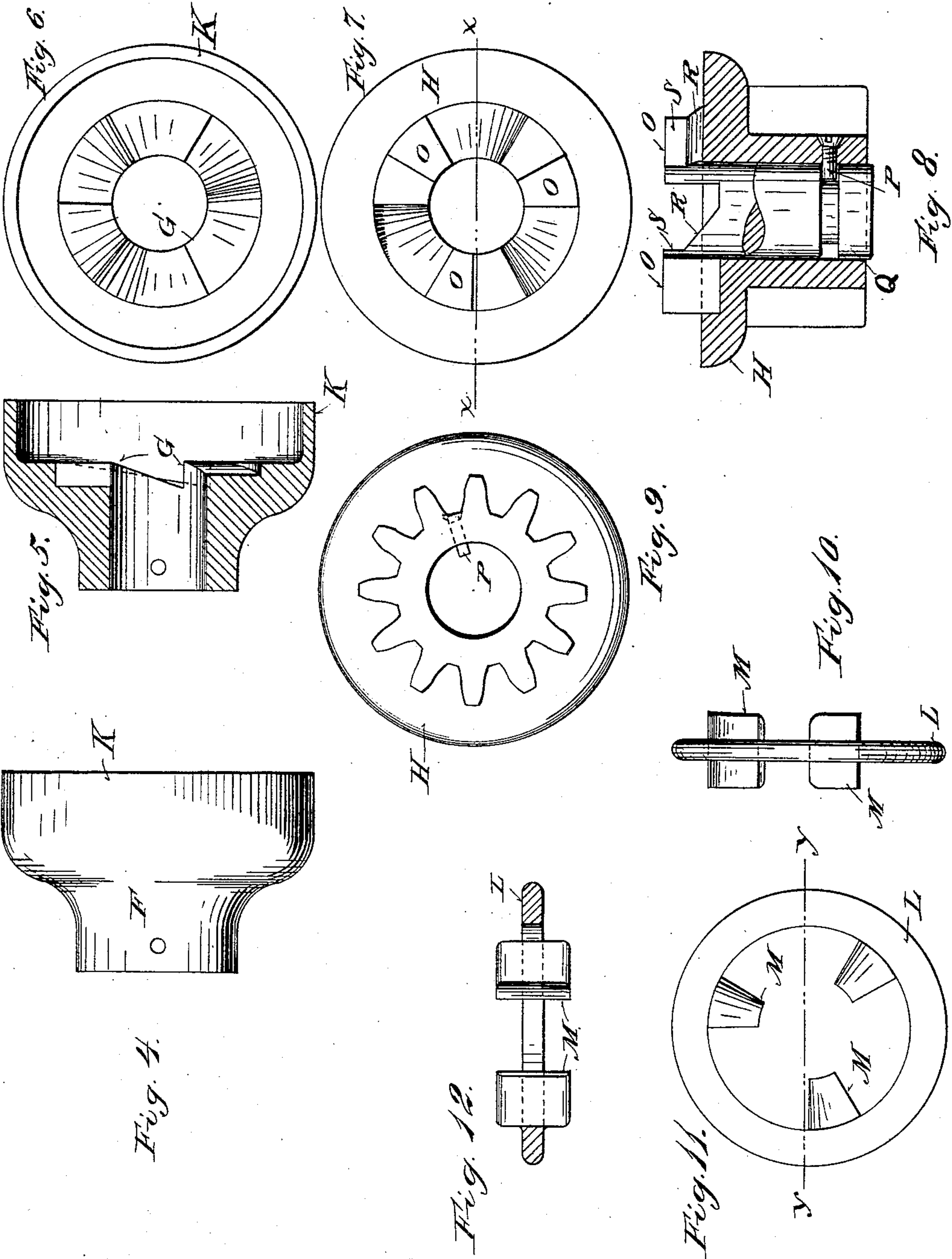
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H. M. Plaisted
J. E. Hawley

INVENTOR

Albert L. Slager
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UNITED STATES PATENT OFFICE.

ALBERT L. SLAGER, OF SPRINGFIELD, OHIO, ASSIGNOR TO THE G. S. FOOS COMPANY, OF SAME PLACE.

CLUTCH.

SPECIFICATION forming part of Letters Patent No. 480,748, dated August 16, 1892.

Application filed June 22, 1891. Serial No. 397,127. (Model.)

To all whom it may concern:

Be it known that I, ALBERT L. SLAGER, a citizen of the United States, residing at Springfield, in the county of Clark and State of Ohio, have invented certain new and useful Improvements in Clutches, of which the following is a specification, reference being had therein to the accompanying drawings.

My invention relates to certain new and useful improvements in clutches, being especially adapted for use on lawn-mowers, the peculiarities of which will be hereinafter pointed out and claimed.

In the accompanying drawings, on which like reference-letters indicate corresponding parts, Figure 1 represents a plan view of a portion of the reel-shaft mounted in its boxes in one end plate, the ground-wheel in section, and my form of clutch forming the operative connection between said ground-wheel and reel-shaft, portions being broken away to show the parts in their operative position; Fig. 2, a view of the clutch detached and parts broken away to show the dog disengaging from the ratchet-head; Fig. 3, a similar view of Fig. 2, showing the dog entirely disengaged from the ratchet-head; Fig. 4, a side view of the ratchet-head; Fig. 5, a sectional view on the axis thereof; Fig. 6, an end view of the ratchet end of the head; Fig. 7, a similar view of the matching end of the pinion; Fig. 8, a sectional view through the axis of the pinion, showing its connection with the reel-shaft; Fig. 9, an end view of the pinion; Fig. 10, an edge view of the interlocking dog; Fig. 11, a side view of the same, and Fig. 12 a cross-section of the dog on the line *y y* of Fig. 11.

The letter A designates the end plate of a lawn-mower, for instance, having a box B, in which is mounted a shaft C, carrying the reel-blades D. A cap E covers the said box and forms a housing for a ratchet-head F, pinned or otherwise secured to the reel-shaft to turn therewith. Ratchet-teeth G are formed on one end of said head, adapted to rotate the shaft forward when operatively connected to a pinion H, meshing with the ground-wheel I, mounted on its axle-pin J in the usual manner. The ratchet-head is preferably provided with an annular axially-ex-

tending flange K, forming a recess, which is closed by the disk portion of the pinion H. Within this recess, and thus protected from dirt and other obstructions, is loosely mounted an interlocking dog consisting of a ring L, to which are cast or otherwise secured projections M, extending outward on both sides of said ring and having a face adapted to engage with the square driving-face of said ratchet-teeth G on one side and rounded or beveled on the other side to engage with the inclined face of said teeth. The other end of the lug M on the opposite side of said ring is adapted to be engaged by one or more lugs or projections O from the face of the pinion H, as shown in Fig. 1. The lug O is provided with an incline on one side, adapted to slidingly engage the lug M, and also with a square face to operate positively on said lug at one end of the incline. The other face of said lug O is square to match with the square face of said lug M. The dog is free to move axially on the shaft C as well as rotatably thereon, and by its interlocking engagement between the pinion H and the ratchet-head F the motion of the ground-wheel is transmitted to the reel-shaft. The pinion H is rotatably mounted on the shaft C and is prevented from displacement by the inclosing ground-wheel. It is preferred, however, to avoid the friction between the end of the pinion and the wheel by means of a screw P in said pinion projecting within an annular notch Q in the shaft C. The pinion is thus free to rotate loosely on said shaft, but is prevented from axial movement.

I will now describe the operation of the clutch. The rotation of the ground-wheel in the direction of the arrow will cause the pinion to rotate in the same direction and the inclined faces of the lugs O will push the lugs M into engagement with the ratchet-teeth of the head F and cause the reel-shaft to rotate in the same direction, as shown in Fig. 1. The operative side of the lug O therefore consists of an inclined portion R and a square portion S, whereby the dog is forced axially on its shaft and then rotated by the said inclined and square portions, respectively. When the pinion is reversed by a reverse or backward motion of the ground-wheel, the lug O will be

engaged with the lug M and rotate the dog. The inclined face of the ratchet-tooth adjacent thereto will force the dog axially outward as the reverse motion continues, as is shown in Fig. 2. No rotation is thus given to the ratchet-head by said reverse motion of the pinion and dog, which latter will be forced outward toward the pinion by the reverse motion, the lug O extending under the ring L and its rear face sliding past the front face of the lug M till the ring and pinion are in close proximity, as shown in Fig. 3. The reverse motion of the pinion and dog may therefore continue indefinitely without contact with the ratchet-head. There is no continuous clicking sound, due to the lugs M ratcheting by the teeth G, as they are normally out of contact therewith during the reverse motion. On the forward movement of the pinion, when the parts are in position shown in Fig. 3 the inclined faces R will first act to throw the dog along the shaft into engagement with the ratchet-teeth G and then exert a pressure thereon through the positive driving-faces S on the forward side of said lug O. One or more of these ratchet-teeth and lugs may be employed, or three of each, which have been found to work satisfactorily and give a quick and positive engagement of the clutch.

Each side of the lawn-mower or other machine may be provided with a clutch, as before described. In this case the ratchet-head and pinion are formed right and left. The interlocking dog may be simply reversed, as both sides are preferably similar, but need not necessarily be so, since they may also be right and left, if so desired. It will be seen from Figs. 10 and 12 that the lugs M extend from either side of the pinion or ring L on which they are mounted. I do not, however, wish to limit myself to the exact form and construction of the notching parts as herein illustrated.

By mounting the ratchet-heads so that their teeth will alternate with each other an almost instantaneous clutch action with the reel will be secured through one or the other end of the reel-shaft.

When the lawn-mower is stopped in its forward movement, the momentum of the reel-blades will cause them to continue to revolve rapidly. The inclined faces of the ratchet-teeth will in this case instantly throw the dog outward to its inoperative position, as in Fig. 3, thus allowing the ratchet-head to revolve silently out of contact with the same. The

clutched position will be assumed immediately on a forward motion of the machine. It will be observed that this clutch is adapted to drive from one end or member thereof to the other, and that the driving member cannot become the driven member through the above-described interlocking device. There is thus no danger of accidental engagement of the members in a reverse direction to cause breakage of the parts thereof.

While I have referred to the device H as a pinion, it is obvious that whether it be a pinion, pulley, or other means of transmitting or receiving motion is not material, so long as it possesses the features of this device H; also, the lugs O, forming the operative faces, may extend more or less from the end of the pinion H, or may be recessed wholly within the same, instead of partially so, as herein illustrated.

Having thus fully described my invention, what I claim as new, and wish to secure by Letters Patent, is—

1. In a clutch, the combination, with a head having ratchet-teeth on one end and having a housing extending out beyond said teeth, of a dog consisting of an annulus provided with teeth symmetrically located on each side thereof, so that both sides are alike and matching said ratchet-teeth of the head, and a closing disk or piece adjacent to said housing and having teeth opposite to said ratchet-teeth and matching with the teeth of said dog, and a support for said pieces, whereby the dog constitutes a symmetrical clutching connection between said head and disk and is adapted to be used with right or left hand inclosing members.

2. In a clutch, the herein-described dog, the same consisting of an annulus of comparatively small thickness to take up as little room axially as possible and provided with teeth or lugs extending out substantially the same from both sides, whereby the dog is symmetrical and adapted to be reversed, the said lugs or teeth being open through the sides of the annulus to allow the operative teeth engaging therewith to extend into or beyond the annulus.

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

ALBERT L. SLAGER.

Witnesses:

OLIVER H. MILLER,
WARREN M. MCNAIR.