(No Model.)

F. M. WATERS.

LAWN MOWER.

No. 383,927. Patented June 5, 1888.

Fig. 1

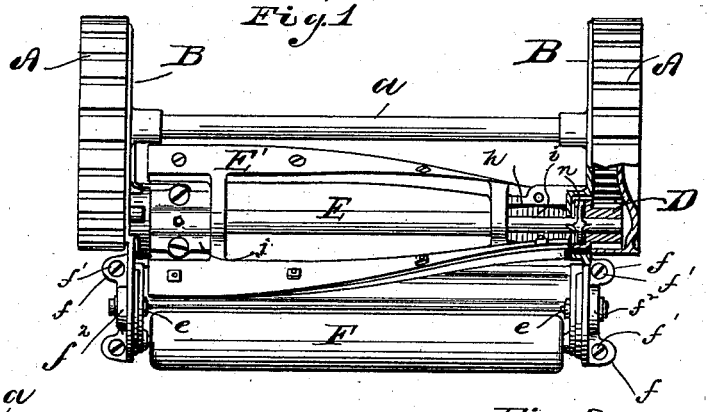


Fig. 2

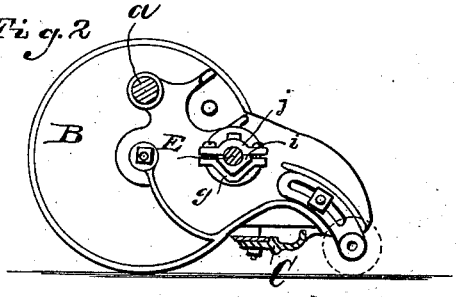


Fig. 3

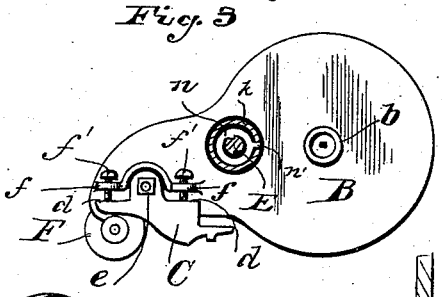


Fig. 4

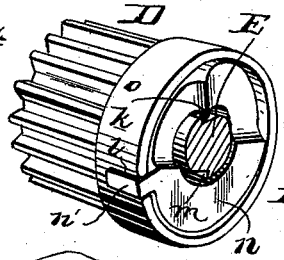


Fig. 5

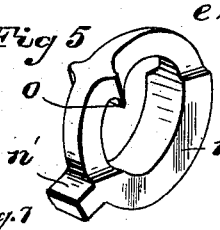


Fig. 6

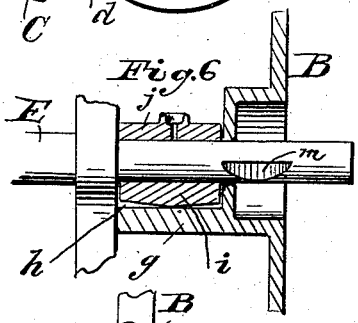


Fig. 7

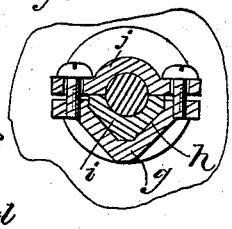


Fig. 8

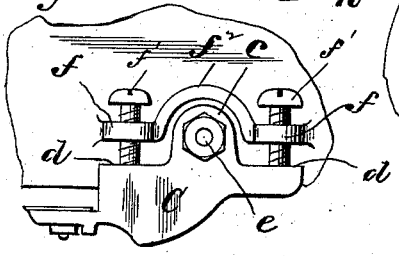
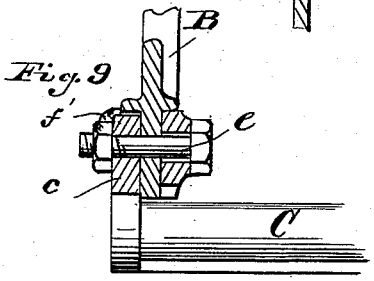


Fig. 9



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Inventor.
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Atty.

UNITED STATES PATENT OFFICE.

FRANK M. WATERS, OF SPRINGFIELD, OHIO.

LAWN-MOWER.

SPECIFICATION forming part of Letters Patent No. 383,927, dated June 5, 1888.

Application filed November 15, 1887. Serial No. 255,277. (No model.)

To all whom it may concern:

Be it known that I, FRANK M. WATERS, 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 Lawn-Mowers, of which the following is a specification.

My invention relates to that class of lawn-mowers in which the cutting is done by a revolving cutting-reel in connection with a non-revolving or stationary cutter-bar, the motive power to produce the cutting being supplied from the carrying-wheels through the medium of a clutch mechanism which is adapted to drive the cutting-reel in a forward direction only, so that the carrying or driving wheels are permitted to revolve independently of the cutting mechanism when the mower is propelled in a backward direction.

The object of my invention is to provide a simple and novel construction of the stationary cutter-bar in relation to the supporting-frame, whereby the said cutter-bar may be quickly and readily adjusted in relation to the revolving cutting-reel and held securely in any desired position of adjustment, the adjustment being accomplished without reversing or changing the machine from its normal position.

The further object of my invention is to provide a novel arrangement of the revolving cutting-reel and its supporting-bearings in relation to the supporting-frame, whereby the said bearings are always maintained in perfect alignment and the cutting-reel shaft prevented from becoming cramped in assembling the machine or by an undue strain thereon.

The further object of my invention is to provide a novel clutch mechanism which shall embody in its construction but few parts adapted to work without the use of springs of any kind and comparatively noiseless in its operation, the engaging parts being so constructed that the force of gravity and the centrifugal force of the revolving parts will each assist in bringing the parts into engagement and maintaining the engaging parts in contact.

My invention consists in the various constructions and combinations of parts hereinafter described, and set forth in the claims.

In the accompanying drawings, which form a part of this specification, Figure 1 is a plan view of a machine embodying my invention. Figs. 2 and 3 are respectively a sectional view and an end elevation showing the inside and outside of the end portions of the supporting-frame and the subjoined mechanism, and illustrating different methods of securing the roller-brackets, the supporting or driving wheel in one case being shown removed. Figs. 4 and 5 are detailed views, in perspective, of the clutch mechanism. Figs. 6 and 7 are detailed views of the cutting-reel bearings, and Figs. 8 and 9 are detailed views of the stationary cutting-bar and the means for adjusting the same.

In the following description like parts are indicated on the said drawings throughout the several views by similar letters of reference.

In the said drawings, A represents the driving or supporting wheels which support the main frame. The main frame consists of the end pieces, B B, connected together at the top by a connecting-rod, *a*, and at the bottom by the stationary cutter C. The wheels A are journaled in the ordinary manner on projecting studs *b* on the end pieces, B, and are provided with the customary internal gear adapted to engage with the pinions D on the respective ends of the shaft E of the cutting-reel E'. The reel-shaft E is supported at either end in bearings on the end pieces, B B, in which it is adapted to turn to cause the reel to revolve above the stationary cutter C. The rear portion of the machine is supported by the usual rear supporting-roller, F.

The stationary cutter, as before stated, extends across the bottom of the machine, and is connected at each end to the respective end pieces, B B. Now, in order to provide a simple and efficient means for adjusting the cutting-edge of the stationary cutter in relation to the revolving cutting-reel, I extend the stationary cutter at each end beyond the end pieces, B B, respectively, and provide each end of said stationary cutter with an upwardly-extending ear, *c*, which is provided on either side thereof with laterally-projecting bearing-faces *d d*, preferably at right angles to said ear. Each of the ears *c* is pierced with an opening adapted to receive a supporting-bolt, *e*, which passes through the said projecting ear, and also through the end piece, B, to which it is adjacent. Each of the end pieces is provided on either side of the supporting-bolts

e with laterally-projecting lugs *f f*, through which are projected adjusting-screws *f' f'*, adapted to come into contact with the bearing-faces *d d* of the ear *c*. It will be seen now that when the supporting-bolt *e* is in place the stationary cutter may be readily adjusted to or from the revolving cutting-wheel by slightly loosening the said bolt and turning the cutter-bar thereon in the direction desired by loosening one of the adjusting-screws and tightening the other, after which the supporting-bolt is again tightened. I preferably connect the lugs *f f* by a curved shield, f^2, adapted to stand above and form a hood or covering for the ear *c* and the bolt *e*, thus protecting the bearings of the stationary cutter.

It will be seen that an efficient and simple means is thus provided by which the stationary cutter is secured in place or adjusted as desired, the parts being all easily accessible without changing the machine from the normal position.

The reel-shaft E, as before stated, is supported at each end in bearings on the end pieces, B B. These bearings are each formed of a projecting support, *g*, on the end piece, having a depression or groove, *h*, therein, preferably V-shaped, as shown. In each of these V-shaped depressions or grooves the bearing-block *i* is placed, the said bearing-block *i* being formed in cross-section, with its inside adapted to conform to the shape of the shaft and its outside to the shape of the depression or groove *h*. The bearing-block *i* is placed loosely in the depression *h*, and is tapered on the outside each way from the middle, so that it is free to adjust itself to the position of the shaft which is placed therein. The bearing is completed by a cap, *j*, which rests on either side against the top of the adjustable bearing-block *i*, and is secured by suitable fastening-screws to the projecting support *g*, the holes in the said caps through which the screws pass being larger than the said screws, to permit the cap to adjust itself to the loose bearing-block *i*. It will be seen that by this construction the bearings are adapted to maintain a perfect alignment with each other and adjust themselves to the reel-shaft, so as to avoid cramping of the parts in assembling or by any undue shock or strain thereon.

The clutch mechanism, which serves to transmit the power from the pinions D D to the reel-shaft, I construct as follows: Each of the pinions D D is provided with a rim, *k*, extending from one end thereof, and having a slot, *l*, in its periphery. Each of the pinions is adapted to turn freely on the shaft E, which is adapted to be engaged by an annular collar or ring, *n*. Located within the rim *k* of each pinion, and surrounding the shaft E, is an annular collar or clutching-ring, *n*, with a projection, *n'*, on its outer periphery, which fits loosely in the slot or recess *l* in the rim *k* of the pinion, and with a ratchet-shaped projection, *o*, on its inside face, adapted to engage with the shaft E when the pinion is rotated in one direction and not to engage it when rotated in the other direction. The points of engagement between the clutching-rings and shaft are preferably formed by means of grooves or notches *m*, provided in the shaft E, as shown in Fig. 6. It is obvious, however, that they may be constructed in any other suitable well-known manner which will permit the shaft to turn freely in one direction and become engaged with the clutching-ring when turned in the opposite direction. The clutching-ring is formed with a preponderance of weight on the side opposite to the projection *o*, so that as the ring is revolved rapidly with the pinion the centrifugal force will cause the heavier portion of the ring to leave the shaft and bring the inside projection on the opposite and lighter side to engage with the engaging-points of the shaft. When the pinion is revolved slowly, the ring will fall by gravity, causing the engagement. It will thus be seen that when turned in one direction a positive engagement of the clutch is insured, either by gravity or centrifugal force.

The machine as thus described is simple and efficient in construction and operation, and capable of ready and easy adjustment.

I have shown the rear supporting roller-brackets adapted to be adjustably secured by the same bolt, *e*, which secures the ends of the stationary cutter. This makes a very simple and desirable construction, by means of which all the parts thereof may be readily adjusted. It is obvious, however, that the roller-brackets and stationary cutter may be secured independently, if desired, by changing slightly the position of the said brackets and providing an additional bolt.

The machine is adapted to be propelled in any well-known manner, preferably by means of a handle attached to the end pieces in the ordinary way.

It is obvious that the various features of the invention herein described may be variously modified in a manner which will readily suggest itself to the mind of an ordinary mechanic. I do not, therefore, limit myself to the exact construction described and shown.

Having thus described my invention, I claim—

1. The combination, with the end pieces, of the stationary cutter having upwardly-extending ears, with bearing-faces on either side thereof, projecting lugs on said end pieces provided with adjusting-screws adapted to bear against said faces, a connecting-bolt passing through said end pieces and ears, and a shield or cap connecting said lugs and forming a hood or covering for ears, substantially as set forth.

2. In a lawn-mower, the end pieces, each having an inwardly-projecting bearing-support with a V-shaped depression therein, the cutting-reel and its shaft, a loose bearing-block seated in said bearing-support, the inside of which is adapted to conform to said shaft and the outside to the V-shaped depression, said bearing-block being tapered from the middle

toward both ends, as set forth, and provided with a cap secured to said bearing-support, substantially as set forth.

3. The combination, with the end pieces, each having an inwardly projecting bearing-support with the V-shaped depression therein, the tapered bearing-block adapted to rest in said V-shaped depression, and a cap over said bearing-block, of a cutting-reel, the shaft of which is journaled in said bearing-block, the stationary cutter under said reel secured at each end to said end piece, and a connecting-rod connecting said end pieces, substantially as specified.

4. The combination, with the reel-shaft, of a driving-pinion having a clutching-ring secured to and adapted to turn therewith, said ring being adapted to encircle the shaft, and having a projection on the inner face thereof adapted to engage the said shaft when turned in one direction and to turn freely thereon when turned in the opposite direction, and formed with a preponderance of weight on the side opposite to the said projection, substantially as specified.

5. In a driving-clutch, the shaft-encircling clutching-ring constructed with a driving-offset on its inner face and an engaging projection on its outer periphery, substantially as and for the purpose set forth.

6. In a driving-clutch, a shaft-encircling clutching-ring with a driving-offset on its inner face and an engaging projection on its outer periphery, and having a preponderance of weight upon the side opposite to the inside offset, substantially as set forth.

7. In a clutch, the combination, with a shaft, of an inclosing-rim provided with a slot or opening therein, and a clutching-ring having an outer projection adapted to engage in said slot and an inner projection to engage said shaft, said clutching-ring being formed with a preponderance of weight on the side opposite the inner projection, substantially as set forth.

In testimony whereof I have hereunto set my hand this 9th day of November, A. D. 1887.

FRANK M. WATERS.

Witnesses:
JOSHUA SCOTT,
PAUL A. STALEY.