

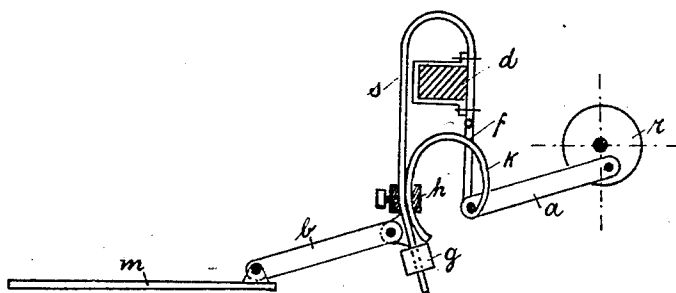
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H. SCHIEFERSTEIN

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MOWING MACHINE

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Inventor.
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UNITED STATES PATENT OFFICE.

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MOWING MACHINE.

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To all whom it may concern:

Be it known that I, HEINRICH SCHIEFERSTEIN, a citizen of the German Republic, residing at Berlin-Charlottenburg, Kaiser-
 5 Friedrichstrasse 1, Germany, have invented certain new and useful Improvements in Mowing Machines, of which the following is a specification.

This invention has reference to improve-
 10 ments in mowing machines, and it particularly refers to means for reducing the strain, due to the oscillatory motion, on the operating parts of the machine in a novel manner, and it is also intended to generally improve
 15 and to simplify the construction and operation of machinery of the kind referred to. In the operating means heretofore known and used in connection with mowing machines the crank pin is compelled to impart
 20 kinetic energy to the knife or knives at the beginning of each stroke, while it must absorb any excess of kinetic energy before the termination of the stroke, such excess being destroyed in the form of friction. In such
 25 construction the consumption of energy of the machine is greatly increased, and the crank pin is frequently heated beyond the admissible limit. In view of these difficulties this invention operates on the principle
 30 of imparting oscillating movement to the knife or knives of the mowing machine by a mechanical oscillatory system, thereby supplying only that energy by the crank which is actually consumed in the operation of the
 35 machine.

The invention will be more fully described with reference to the accompanying drawing showing by way of example and in a diagrammatic manner the main operating portions of a mowing machine partly in elevation and partly in section. Upon the relatively stationary bar or thill *a* of the machine shown in cross section in the drawing a strong spring *s* is adjustably mounted.
 45 Near the bottom end of said spring the knife *m* is articulated by the intermediary of a link *b* on a corresponding knife bar. Upon pulling this spring *s* laterally and then releasing it the spring causes the knife to be
 50 reciprocated several times with a definite period of reciprocation, whereupon the system returns to its position of rest. The definite number of oscillations performed by this system, constituted by knife *m*, link *b*
 55 and spring *s* per second is called the oscilla-

tion frequency of the oscillatable system constituted by the mass of the knife, its link, if a link be used, and the spring. The oscillation frequency of the system is selected so as to cause it to approximately agree with
 60 the normal number of operating revolutions. By the displacement of the spring *s* at its point of attachment or by displacing or altering the weight *g* mounted on the spring, which, if desired, may be entirely
 65 dispensed with, the oscillation frequency may be varied, whenever required.

To the storage or accumulating spring *s* is fastened the auxiliary or coupling spring
 70 *k* the operative length of which may likewise be varied by displacement within the fastening member *h*. The coupling spring *k* is connected by means of the pitman rod *a* to the crank wheel *r*, and it is guided by the
 75 link *f*. Upon now rotating the crank wheel the coupling spring *k* produces tensional forces of varying directions at its point of attachment in consequence of which the oscillatory system *a*, *b*, *m* commences to be
 80 oscillated, and this the more in proportion as the number of revolutions of the crank per unit of time approximates the oscillation frequency of the oscillating system. The inertia of the reciprocating oscillating
 85 knife is converted in the terminal positions into potential energy in the energy storing spring *s*, and is always restored after the reversal of the direction of movement. The crank pin merely supplies and makes up for the consumed efficient output. It has been
 90 shown by experiments that the tractional force required is considerably less than that necessitated with machines of that type as heretofore constructed, and that the crank pin remains perfectly cool. The oscillating
 95 system is preferably entirely or approximately in tune with the rotating crank wheel.

It is evident that one or the other of the resilient or elastic members may be shaped
 100 so as to constitute a spiral spring, or it may be constructed similar to a railroad buffer spring. It is also to be understood that my invention is susceptible of various other
 105 modifications and constructional alterations as the changing conditions of its application and the convenience of the operator may demand, and without departing from the spirit of my invention as pointed out in the claims.

I claim:—

1. In a mowing machine, the combination with oscillating parts; of a resilient energy storing member operatively connected therewith and constituting an oscillatory system of definite oscillatory frequency, and means to drive said system substantially in synchronism with such frequency, and a resilient member connecting the oscillatory system and the driving means.

2. In a mowing machine, the combination with oscillating parts including a cutter blade, a rotating crank and a resilient connecting member; of resilient storing means for driving said oscillating parts and driven by said crank, said crank operating said resilient connecting member and the resilient connecting member operating said oscillating parts in synchronism with the frequency period of said resilient storing means and oscillating parts.

3. In a mowing machine, the combination with oscillating parts including a cutter blade; of an energy storing spring operatively connected to said parts, means for oscillating said spring and parts substantially in synchronism with the oscillating period of said spring and connected parts, and a resilient connection between the spring and operating means.

4. In a mowing machine, the combination with oscillating parts, a resilient member operatively connected therewith and constituting an oscillatory system of definite oscillatory frequency; of means to drive said system substantially in synchronism with such frequency, a resilient member connecting the oscillatory system and the driven means, and means to adjust the elasticity of said resilient member.

5. In a mowing machine, a relatively stationary member, a spring secured to said member, a reciprocable mower knife connected with said spring, a crank, and a resilient driving connection between the crank and spring.

6. In a mowing machine, a relatively stationary member, a spring secured thereto, a cutter connected to the spring, a resilient member connected to the spring, and reciprocating mechanism connected to the resilient member.

7. In a mowing machine, a relatively stationary member, a spring secured thereto, a reciprocating cutter connected with said spring, a reciprocating driving mechanism

and an auxiliary spring connected to the first spring and the reciprocating mechanism.

8. In a mowing machine, a relatively stationary member, a spring adjustably fastened thereon, a reciprocable cutter blade connected to said spring, a driving mechanism to set up vibrations in said spring, and an auxiliary spring connected to the driving mechanism and adjustably connected to the first spring.

9. In a mowing machine, a relatively stationary member, a spring secured thereto, a cutter connected to the spring, a resilient member connected to the spring and reciprocating mechanism connected to the resilient member, and means to adjust the vibrations of the spring substantially in synchronism with the movements of said mechanism.

10. In a mowing machine, a relatively stationary member, a spring adjustably connected at one end to said member, a reciprocating cutter connected to the other end of said spring, a driving mechanism for imparting reciprocating motion, and an auxiliary spring connected to the driving mechanism and adjustably connected to the first spring.

11. In a mowing machine, a relatively stationary member, a spring connected at one end to said member, a reciprocating cutter connected to the other end of said spring, a mechanism for imparting reciprocating motion, comprising a crank and a pitman rod, said rod operatively connected at one end to said crank, a link suspending the other end of said rod and an auxiliary spring connected at one end to said first spring and at its other end to said rod.

12. In a mowing machine, a relatively stationary member, a spring adjustably connected at one end to said member, a reciprocating cutter connected to the other end of said spring, means to adjust the frequency of vibration of said spring, a mechanism for imparting reciprocating motion, comprising a crank and a pitman rod, said rod operatively connected at one end to said crank, a link suspending the other end of said rod, and an auxiliary spring adjustably connected at one end to said first spring and at its other end to said rod.

In testimony whereof, I affix my signature.

HEINRICH SCHIEFERSTEIN.