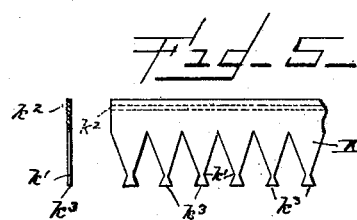
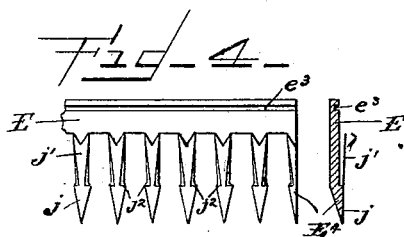
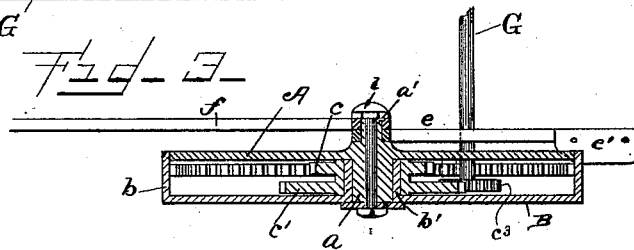
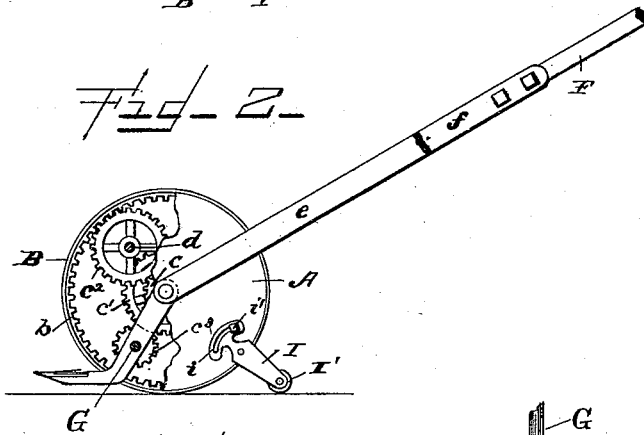
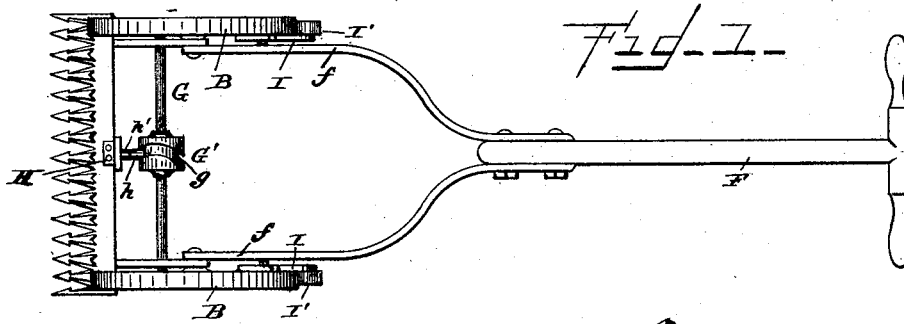


(No Model.)

J. E. CROOK & J. J. DAVIS.
LAWN MOWER.

No. 491,039.

Patented Jan. 31, 1893.



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UNITED STATES PATENT OFFICE.

JAMES E. CROOK AND JOHN J. DAVIS, OF LINCOLN, NEBRASKA.

LAWN-MOWER.

SPECIFICATION forming part of Letters Patent No. 491,039, dated January 31, 1893.

Application filed May 5, 1892. Serial No. 431,942. (No model.)

To all whom it may concern:

Be it known that we, JAMES E. CROOK and JOHN J. DAVIS, both citizens of the United States, and residents of Lincoln, in the county of Lancaster and State of Nebraska, have invented a new and useful Improvement in Lawn-Mowers, of which the following is a full, clear, and exact description, reference being had to the accompanying drawings, making part of this specification.

Our invention relates to the construction of the frame plate or plates of the mower, the arrangement of the gearing for actuating the cutters and of the roller arms in connection therewith and to the construction of the cutting apparatus, and will be understood from the following description and claims, reference being had to the accompanying drawings, in which:—

Figure 1 is a plan view of a mower embracing our improvements. Fig. 2 represents a longitudinal section through the machine, showing the frame and inner face plate to one of the wheels broken away in part, to show the arrangement of the gearing. Fig. 3 represents a horizontal section, enlarged, through one of the drive wheels and the covering frame plate connected therewith, and Fig. 4 represents a plan view of a part of the finger bar and a section through said bar and one finger and Fig. 5 similar views of the knife bar and a knife section.

A indicates a frame plate, which constitutes also a face plate for covering the inner, open face of the gear and carrying wheel, one for each wheel, B, B. These plates are made in disk form, of a diameter to fit and fill in the peripheral flange of the gear wheel B, which is also made in disk form and provided with an inwardly projecting flange *b*, within which the frame plate A fits, as stated, the two disks and the wheel and flange forming a casing for inclosing and protecting the gearing actuating the cutters. The plate A is provided with a tubular hub or outwardly projecting sleeve stud shaft *a* on which the wheel B is journaled and the inwardly projecting hollow hub *b'*, of the latter, serves also as a stud shaft, on which a double transmitting gear wheel or pinion *c, c'*, is journaled to rotate freely between the wheel and frame

plate disks, as shown in Fig. 3. The flange *b* is internally toothed and at a point midway between said toothed rim and the pinion *c*, the plate A is provided with a stud shaft, indicated in the dotted lines, Fig. 3, at *d*, on which a pinion *c'*, is journaled, which pinion engages and is driven by said toothed rim and, in turn, engages the part *c* of the double pinion *c, c'*, driving the latter. The part *c'* of this double pinion engages a pinion *c'* on the cam shaft, actuating the cutters, as will further appear, said pinion *c'* being connected with the shaft G by any suitable form of backing ratchet, to permit their independent movement when required. The plates A are further provided each with a short hollow stud *a'* on their inner, adjacent faces, and on these the upper rear ends of the cutter-frame arms *e, e*, are journaled and also the forward ends of the arms *f, f*, of the propelling or thrust frame, hereinafter more fully described. The arms *e, e*, extend downward and forward and terminate in forwardly projecting fingers or shoes *e'* to which the finger bar indicated at E, Fig. 4, is firmly bolted, said bar and the arms *e, e*, constituting the cutter frame, proper, which is free to rise and fall in following the undulating surface of the ground, vibrating with the sleeves *a'* as axial centers, coinciding with those of the wheels B, B.

The cam shaft G on the ends of which the actuating pinions *c'* are mounted, is journaled in perforations in, or bearings on the arms *e, e*, and, vibrating with said arms and the plates A, as the cutting apparatus rises and falls, the pinions actuating said shaft are always held in proper working relation to the actuating gearing described. The shaft G carries a drum or cylinder G' located at or near the center of its length and provided with a wave-cam groove *g*, with which a friction roller *h* on the rear end of a pin or stud *h'*, rigid on an angular plate H, bolted to the knife bar, engages, for reciprocating the latter.

The plates A have arms I pivoted to them, provided on their rearwardly projecting lower ends with wheels or casters I' which rest and roll lightly on the surface of the ground and serve to steady the movement of the plates A.

The upper ends of these arms are expanded in width and have curved slots i formed in them through which set screws i' pass into the plates A, permitting the adjustment of the angles of the roller arms as may be required.

The guard fingers indicated at J are rigid on the bar E and are what we term "spear pointed" and are provided with caps or guards j' which expand in width rearwardly and are left open or unsupported at their rear ends to permit the free escape of matter carried in between them and the fingers to which they are attached at their forward narrow ends only, in such manner as to leave shoulders on the fingers at the sides of said ends at j^2 . The bar E is provided near its rear edge with a groove e^3 extending the whole length of the bar and in which a rib k^2 on the lower face of the knife bar K rests and moves, the lateral movements of the latter being guided and steadied thereby.

The knives proper are of the usual form except that instead of terminating in a sharp point at their forward ends, they are brought nearly to a point at k' and thence extending forward expand again in width the diverging sides of said extension terminating the same transverse plane, in a forward straight side k^3 , parallel with the line of movement of the knife bar. This gives to each side of the point or forward portion of the knife an angular or hook form, and, the forward straight side k^3 of the knife sections; moving in close proximity with the shoulders j^2 , any grass passing by said shoulders will be caught by the hooks or sharp side angles of the triangular knife extensions and so held and cut instead of being thrust forward and downward and left to escape uncut as is frequently the case with the usual sharp pointed knife sections. This construction renders the guiding groove in the finger bar and the rib on the knife bar important, as the straight forward ends of the knife sections must be made to move with precision in close proximity with the shoulders on the spear head fingers. The knife bar may be held down snugly on the finger bar by any usual form of clip or other retaining device.

The thrust frame arms f, f , above referred to, converge in rear of the drive wheels and are united at their rear ends to a handle bar F of usual or any suitable construction, forming in connection therewith the propelling frame of the machine.

It will be seen from the above description that the plates A constitute not only the body or principal feature of the main and gear

frame of the machine, the gearing being mounted thereon, but they constitute also covers for the gearing, protecting it from dust, dirt, &c., and by their construction and arrangement as described, obviate the necessity for a through axle for the support of the drive wheels and which, in this class of machines in the ordinary construction, frequently becomes wrapped and clogged by cut material, an annoyance which our construction avoids.

The wheels are held upon the stud axles and the cutter and thrust frame arms upon their tubular stud by a headed through bolt l , and a suitable washer and nut thereon, as indicated in the drawings.

Having thus described our invention, what we claim as new and desire to secure by Letters Patent is:—

1. The combination in a mowing machine, of the frame plates A, the drive wheels journaled on tubular studs on said plates, the propeller frame, also journaled on studs on said frame concentric with the wheel studs, the reciprocating knife bar located in front of the drive wheel studs and the cutter frame supported on the drive wheel studs and cam-shaft, substantially as described.

2. The combination in a mowing machine, of the frame plates forming also covers for the gearing, the drive wheels journaled on stud axles on said plates, the reciprocating knife bar and its actuating cam-shaft, the cutter frame supporting said knife bar and supported upon both the drive wheel studs and the cam shaft and the ground wheel or caster arm, pivoted to and adjustable on said plates, substantially as described.

3. The finger bar provided with the spear headed fingers and the knife guiding groove, in combination with the knife bar having the rib engaging and moving in said groove and the knife sections having the triangular extensions on their forward ends, substantially as described.

4. In a mowing machine the spear headed and shouldered guard fingers provided with the open caps, in combination with the knife sections having triangular extensions of their points terminating in straight forward edges parallel with the line of motion of the knife bar, substantially as and for the purpose described.

In testimony whereof we have hereunto set our hands this 9th day of April, A. D. 1892.

JAMES E. CROOK.
JOHN J. DAVIS.

Witnesses:

C. M. MARTIN,
CHAS. A. DOUGLASS.