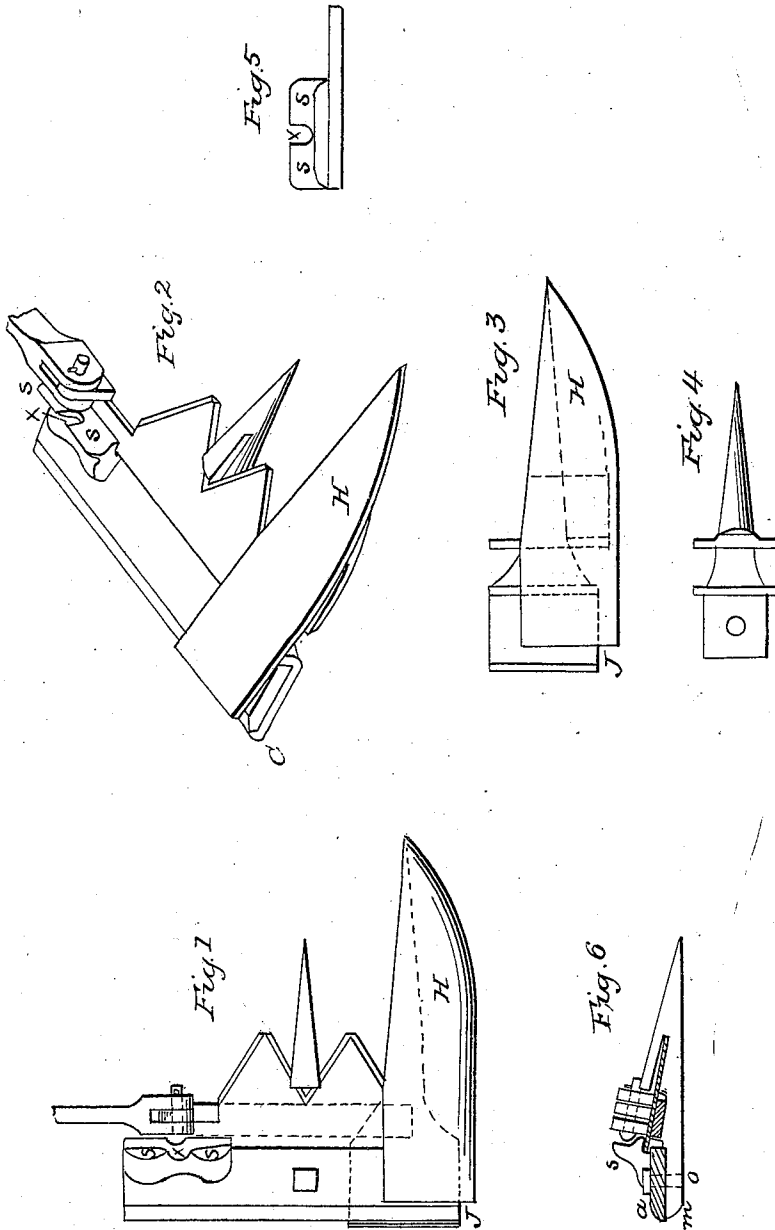


M. G. HUBBARD.  
Harvester Cutter.

No. 23,921.

Patented May 10, 1859.



INVENTOR  
*M. G. Hubbard*

# UNITED STATES PATENT OFFICE.

M. G. HUBBARD, OF PENN YAN, NEW YORK.

## IMPROVEMENT IN HARVESTING-MACHINES.

Specification forming part of Letters Patent No. **23,921**, dated May 10, 1859.

*To all whom it may concern:*

Be it known that I, M. G. HUBBARD, of Penn Yan, Yates county, New York, have invented certain new and useful Improvements in Mowing-Machines; and I do hereby declare and ascertain the same as follows, reference being had to the accompanying drawings, illustrative thereof.

The improvements herein described consist in a new arrangement and construction of some of the parts of the cutting apparatus of my well-known two-wheeled mowing-machine, and are calculated to adapt it to the many different varieties of grasses and surfaces of land, and the various obstacles which different sections of the country present to such a machine, and to add to the safety and convenience of its pitman-connection. Other machines now in use are well adapted to some particular localities, but none of them have the requisite qualities to encounter successfully all of the obstacles which they must meet in an extensive agricultural country. Most of the machines in common use will work tolerably well in thin timothy grass upon an unobstructed surface; but these machines in order to meet the general wants of the farming community must also operate perfectly in heavy fine grass, tall light grass, heavy tangled clover, lodged wild grass, prairie-grass, and all their intermediates, and they must clear themselves of cut grass; and their construction must be upon such principles that they may encounter successfully such obstacles as "wet fog," old manure, soft knobs of wet clay projecting up from the surface, &c.; but especially on Western farms they will meet a serious obstacle, called "gopher hills," which require peculiar features in the cutting apparatus to cut through them without clogging with the wet clay or soft soil of which they are formed. It has been my constant aim throughout a thorough and protracted series of experiments to combine in the cutting apparatus of this machine all of the requisite qualities for encountering these various obstacles, and the new features herein described seem to complete this part of my machine and qualify it for all emergencies.

Figure 1 in the drawings hereto attached is a top view of a portion of my improved cut-

ting apparatus. Fig. 2 is a perspective view thereof. Fig. 3 is a view of the outer dividing finger or shoe detached. Fig. 4 is a view of one of the intermediate fingers detached.

Fig. 5 is a back view of the safety-flange for securing the pitman-connection, a top view of which is seen at the inner end of Fig. 1, where *s* represents a flange projecting up close to and back of the joint which connects the pitman to the cutter-bar. This joint is made in the usual manner, and the pin which passes through to form the connection has an oval head. The flange *s* is so placed that the said pin may be introduced at one end of it, or a notch may be cut out of its center, as seen at *x*, which is probably the best form, because at the center of the stroke there would be no tendency of this pin to work out, because the crank would be either pushing or drawing upon it. With this safety-flange no other security is needed to prevent the pin from working out while the machine is at work, and thus the safest and most convenient attachment is formed of the pitman to the cutter-bar.

Fig. 6 is an end view, showing the top and bottom lines of my new finger and the position of the finger-bar with respect thereto, and the manner of attaching the finger to the finger-bar. The most difficult task which I have found in this part of my machine was to attain such definite outlines for these intermediate fingers as to overcome several of the obstacles previously alluded to, as all the different styles of fingers which I had previously seen would either carry old wet fine grass (which is often left on the ground, usually called "wet fog") on their points, and thereby force the standing grass down in front of them; or else, if sufficiently straight on the top to avoid this difficulty, they would be so abruptly inclined upon their lower edge as to create a fatal tendency to ride up over lodged grass; or their side lines would present such abrupt angles or curves as to prevent the perfectly free entrance of the grass to the cutters; or they would be so narrow at their base (at the heel of the cutters) as to lack the strength required to resist the rapid and powerful stroke of the cutters. A guard-finger should be large and strong at its base and considerably longer than they have been made heretofore, and I have discovered

that its outlines should approximate as nearly as convenient to straight lines meeting on a point nearly in front of and on a line with the points of the cutters. Where an independent yielding finger-bar is used, as on my two-wheeled mower, the lower edges of the fingers should rise with as little abruptness as possible, in order to prevent riding up over lodged grass, and the above ascertained definite outlines of a finger enable me to accomplish the several objects and overcome the several obstacles named. It will also be observed that the abruptness in the rise of the lower edge of the finger may be very much diminished by the inclined position of the finger-bar, as seen at  $a$  in Fig. 6, because with this position of the bar the lower line of the finger may commence at the extreme rear end of the shank at  $m$ , and rise in nearly a straight line to the point at  $n$ ; but in thus elevating the front edge of the finger-bar, I encountered considerable difficulty in attaching the fingers with the bolts and nuts, as I had formerly done, as I had passed the bolts up through the fingers and bar and secured them by nuts on the top of the bar near its front edge, and when I elevated the front edge of the bar it brought the nuts too prominent as obstacles to the cut grass sliding off from the bar. To overcome this difficulty, I cut a thread in the hole in the finger and invert the bolt, passing it down through the bar and screwing it into the finger, which brings the head on top of the bar, and this head can be made so thin as to present no serious obstacle to the cut grass. I screw this bolt in by its head, which is square, and I thus use the finger for the nut, as seen at  $o$  in Fig. 6. I was formerly compelled to use a small bolt for this purpose, because a large nut on the top of the bar was objectionable; but with this new arrangement I can use large strong bolts, as the fingers form ample nuts for bolts of any required size.

The outer shoe or dividing-finger has the same duty to perform as the intermediate fingers in supporting the grass to be cut, and, like the inner shoe, it has still another important duty in so protecting the end cutter at the extremity of the cutter-bar as to permit it to stop and change its motion at every revolution of the crank without dragging in the loose or standing grass. These being the only essential duties which the outer as well as the inner shoe has to perform in the process of cutting, and as the duties of the outer shoe relate wholly to the process of cutting, I have aimed to divest it of every objectionable quality not absolutely necessary for that purpose, and at the same time attain great strength with extreme lightness in order that it may be cheaply cast of malleable iron, like the fingers.

As my recently-patented "inner shoe" in its application and arrangements had other and distinct relative elements, I obtained Letters Patent for it as a distinct device on the 9th of

February, 1858; but this new "outershoe" having an intimate connection with my improved finger and finger-bar herein described, I would prefer to illustrate and describe them in their connected and relative positions as auxiliary elements of my perfected cutting apparatus.

To attain the two objects specified as necessary in the outer shoe—viz., to support the grass for the outer cutter to cut against and divide the grass for the outer cutter to change its motion—I construct the main body of it very similar in its proportions to the intermediate fingers (except somewhat larger) and locate it similarly; but on its top edge I form a wide flat dividing-cap,  $H$ , nearly the width of one of the cutters, and extend this cap by a gradual taper to the extreme front end of the main body of the shoe, so it will divide the grass at a point considerably higher than the ground, and thereby bend it over to one side without crushing it down; but in order to attain a perfect action of the outer cutter in cutting against this shoe it is necessary to locate this dividing-cap  $H$  so that it will only come flush with the inner side of the main body of the shoe and project wholly on the outside. This method of construction enables me to attain the specified objects and also to cast this shoe in one light piece, which, from its peculiar shape, possesses great strength, both laterally and vertically, with extreme lightness, and enables it to pierce and sever many obstacles which the ordinary form of shoe would carry on its point, and break down the grass in front of it. It will be observed that this form of the shoe might leave the rear shoulder,  $I$ , so abrupt as to suddenly force down the edge of the standing grass; but to prevent this result I place the finger-bar so that its front edge inclines up nearly the thickness of the bar, as previously described, and consequently the said shoulder  $I$  is rendered so slight and gradual as to allow the standing grass to slip by it without dragging it down. This position of the bar also diminishes the rear shoulders of the fingers to such a degree as to entirely prevent the accumulation of wet clay or soft soil under the cutters in cutting through the gopher-hills, previously alluded to, and enables me to attain such qualities in my cutting apparatus that it will clear itself of fine-cut grass on its top surface as well as the obstacles named on its under surface, and the definite outlines of the fingers, as described, are such that they will neither carry wet fog upon their points nor incline the cutting apparatus to run up over lodged clover nor carry cut grass before it. I also find that by placing the finger-bar in the inclined position described its vertical stiffness is very much increased, which is an important consideration in my machine, because I often carry it suspended at its inner end and projecting out its whole length. Therefore its vertical stiffness is of great importance. Having thus fully described my improve-

ments in mowing-machines, what I claim therein, and desire to secure by Letters Patent as my invention, is—

1. The conformation of the intermediate fingers of a reaping and mowing machine having a conical form with a straight outline from point to heel, as herein set forth, so as to present a straight gradual taper on the under side, as well as above, the whole being constructed and arranged as herein specified.

2. The safety-flange s, for securing the pitman-connection, when constructed and located substantially as set forth.

M. G. HUBBARD.

Witnesses:

O. WATT,  
L. LEWIS.