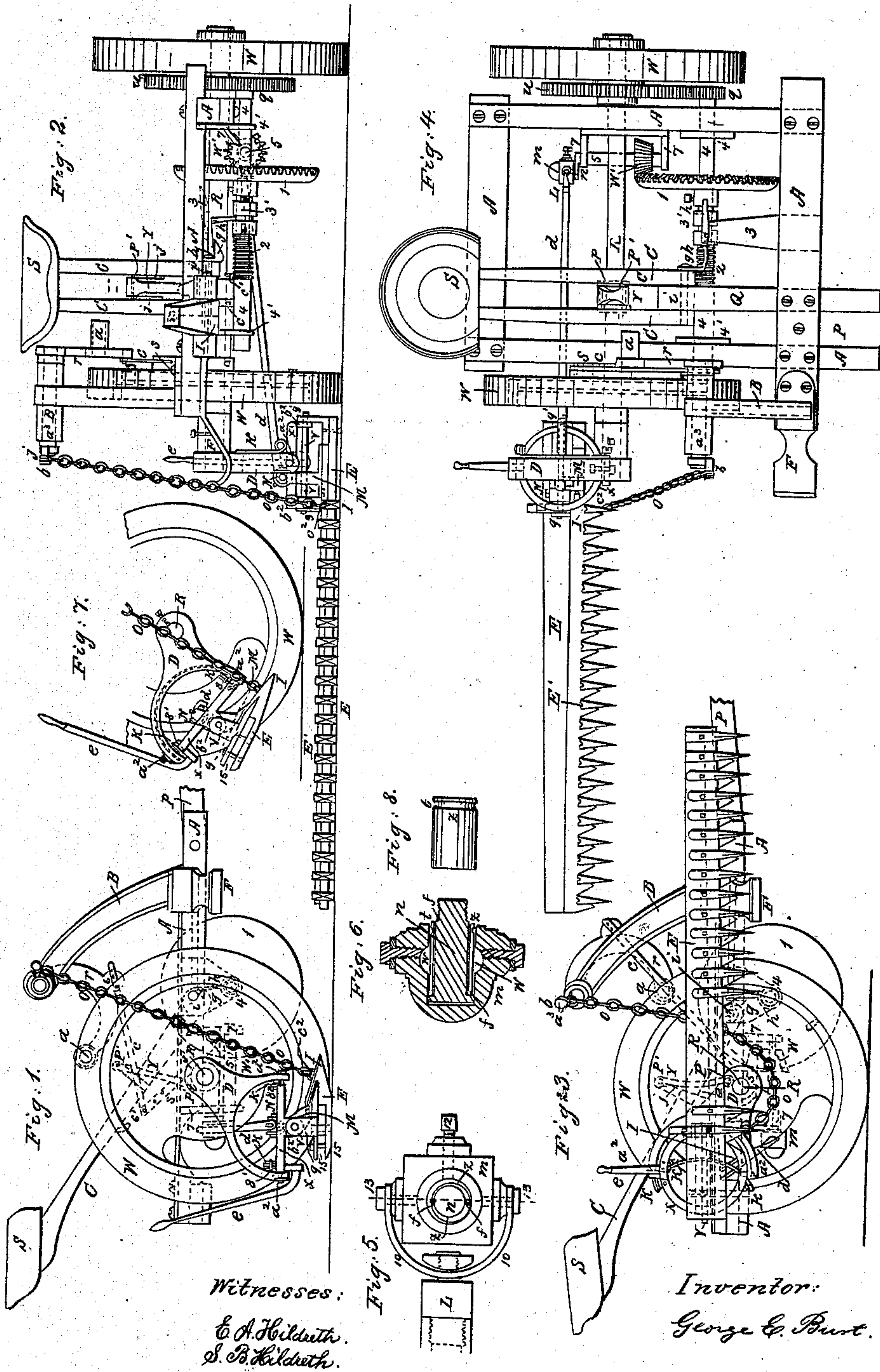


G. E. BURT.
Mowing Machine.

No. 87,539.

Patented March 9, 1869.



UNITED STATES PATENT OFFICE.

GEORGE E. BURT, OF HARVARD, MASSACHUSETTS.

IMPROVEMENT IN MOWING-MACHINES.

Specification forming part of Letters Patent No. 87,539, dated March 9, 1869.

To all whom it may concern:

Be it known that I, GEORGE E. BURT, of Harvard, in the county of Worcester and State of Massachusetts, have invented a new and useful Improvement in Mowing-Machines; and I do hereby declare that the following is a full and exact description thereof, reference being had to the accompanying drawings, and to the letters of reference marked thereon, in which—

Figure 1 is a side view of the machine, with the finger-bar down in working position. Fig. 2 is a front-end view with the finger-bar down. Fig. 3 is a side view with the finger-bar folded up for transportation. Fig. 4 is a bird's-eye view. Fig. 5 shows the crank-wrist box, and a portion of the pitman. Fig. 6 shows a longitudinal section through the center of the crank-wrist box. Fig. 7 is a side view of the finger-bar, hanger, and chain when raised to pass an obstacle. Fig. 8 shows one of the internal half-cylinders of the crank-wrist box.

Like letters represent like parts in all the figures.

It is well known that mowing-machines are often arrested, when in operation, by coming in contact with unseen obstacles, and the operator is often thrown from his seat, and the machine is very much strained and injured by such collision.

The nature of my invention consists in constructing the hanging mechanism of the finger-bar in mowing-machines in such a manner that the finger-bar will yield to fixed obstructions, and pass over them without injury to any part of the machine, or attention of the operator; also, in arranging and constructing the finger-bar and its connections in such a manner that the operator in his seat can elevate the finger-bar, and fold it to pass trees or other high obstacles, to pass through narrow passages in going from field to field, or in traveling on the road; also, in arranging the supports of the operator's seat in such a manner that the operator's weight, when in the seat, shall tend to hold the finger-bar in position in the grass when in operation, but may yield to any firm or fixed obstacle with which the finger-bar may come in contact, and will also tend to lift the finger-bar in passing high abrupt obstacles, without stopping or retarding the onward motion of the mower; also, in constructing and arranging the mechanism for putting the driving apparatus out of gear

(when the finger-bar is elevated at the desirable point for folding it) without any attention of the operator; also, in constructing and arranging a guide attachment for steadying the connecting-joint between the pitman and cutter-bar.

In the accompanying drawings, A is the frame; W W, the supporting-wheels; P, the pole; E, the finger-bar. u is the driving-gear. q is the pinion. l is a bevel-gear. w^1 is a pinion. 5 is the crank-shaft, held in position by the boxes 7 7. k is a spring that tends to lift the outer end of the finger-bar. (Seen in Figs. 2 and 4.) e is a hand-lever, firmly attached to the connecting-ring x . 8 8' are stops in the hanger D. (Seen in Fig. 1.) D is the supporting-hanger, and is suspended on the axle R, to which it is firmly fixed. x is the connecting-ring that connects the hanger D with the finger-bar E by means of the ears 9 9' and b^2 b^2 , and their pivots a^2 a^2 and shaft v . o is a guide and draft chain, connected to the guard-finger I by the pivot c^2 , and to the crank b on the shaft a^3 , which is held in position by the standard B. (Shown in Figs. 1 and 2.) v is a guide that steadies the connecting-joint of the pitman d and cutter-bar E'. It also acts as a pivot to connect the hanger D with the finger-bar E.

M is a sliding standard, which is firmly fixed to the cutter-bar E', and is constructed with a seat for the guide v , at a point above the plane of the cutter-bar, and also with a seat for the pivot N, at a point in the sliding standard nearly in a right line with the crank-wrist and the center of the cutter-bar, when the finger-bar is in position to operate. (Seen in Fig. 2.)

The pitman d is constructed of a hollow tube, and is connected to the bail 10 by the solid section L, Fig. 5, which forms a swivel in the bail 10. The bail 10 turns on pivots 13 13 in the box m .

The box m is constructed with an oil-chamber, w , and an independent internal box, $z z$, Figs. 5, 6, and 8, made in two half-cylinders, of sufficient size to fit the wrist n on the crank-arm, but leaving some play in the box m .

The recesses t in the hollow cylinders $z z$ are wound with any suitable material, which forms a packing, which is arranged to come in contact with the wick f , which is in contact with the wrist n , and the oil in the chamber w .

The box *m* is also provided with a set-screw, 12, which rests on the internal box *zz*, and holds it in position. (Seen in Figs. 5, 6, and 8.)

s is a projecting arm attached to the axle *R*. *c* is an arm that connects the foot-lever *r* with the arm *s*. *a* is a projection on the foot-lever *r*, to rest the foot on to operate the lever. (Seen in Figs. 1, 2, 3, and 4.) *S* is the operator's seat. *C C* are seat-springs, which are pivoted to the arm *Q* by the pivot *i*, Fig. 4. *Y* is a supporting-arm, pivoted to the projecting arms *jj* (which are firmly fixed to the springs *C C*) by the pivot *p'*, and to the arms *e' e'* (firmly fixed to the axle *R*) by the pivot *p*. (Shown in Fig. 2.) *h* is a shipper, which is pivoted to the arm *3*, and has a downward-projecting arm, which operates the clutch *3'*, Figs. 2 and 4. The clutch *3'* is provided with a recess for the shipper *h*, and a slot for a pin, which is fixed to the shaft 4. *g* is an arm projecting from the seat-spring *C*, to operate the shipper *h*, and throw the clutch *3'* out of cog when the cutter-bar is elevated to a proper point to fold. The shaft 4 is held in position by boxes *4' 4'*. *2* is a coil-spring that holds the clutch *3'* in cog with the gear *l*. (Seen in Fig. 2.)

The finger *I* is constructed to extend beyond the cutter-bar, and receive the bolt 15, so that the cap 9 and the finger *I* form a clamp, which is firmly fixed with screw-bolts onto the finger-bar *E*, and clamps the finger-bar firmly in the required position, dispensing entirely with the use of a shoe, as formerly employed. (Shown in Figs. 1 and 7.)

Operation: When the operator is in the seat *S*, and the finger-bar down in position to work, as seen in Figs. 1, 2, and 4, the operator's weight rests on the springs *C C*, which are pivoted to the arm *Q*. The springs *C C* are supported by the arms *jj*, the connecting-arm *Y*, and the supporting-arms *e' e'*, which are firmly fixed to the axle *R*, their pivoted points *p* being a little in the rear of a vertical line passing through the center of the axle or shaft *R*. (Seen in Fig. 1.) It will be seen that in this position the operator's weight tends to turn the axle *R* over back, and hold the finger-bar in position to work. The finger-bar *E* being suspended from the axle *R*, its own weight also tends to hold it in working position, Figs. 1 and 4. The draft-chain *o* also acts in a degree to the same end. These forces all tend to hold the finger-bar sufficiently firm in position to overcome all resistance of such a character as would not injure the fingers or guards, but would yield and allow the finger-bar to pass over firm and fixed obstacles. It will also be seen that the finger-bar *E*, in passing an abrupt obstacle, swings back, and thus turns the axle or shaft *R* forward, and moves the pivot-points *p* on the arms *e' e'* to a point in front of a vertical line through the center of the axle *R*, so that they are acted upon in an opposite direction, and the operator's weight in this position tends to lift the finger-

bar, Figs. 1 and 3. Thus high abrupt obstacles are easily passed without injury to any part of the machine or any attention from the operator.

The guard-chain *o* operates to lift and draw the finger-bar when the mower is in operation. It also holds the fingers parallel with the ground, when the finger-bar is pressed back by an obstacle, until the chain passes the center of the axle *R*. The axle *R* being turned forward by this motion, the arms *s* and *c* and foot-lever *r* being connected with the axle *R* and shaft *a*³, the crank *b* is turned, and takes up the chain *o*, until it passes the center of the axle *R*, thus tending to keep the fingers level. (Seen in Figs. 1 and 7.)

If the obstacle is not too high or very abrupt, the fingers will slide over it, keeping a position parallel with the ground; but if the obstacle is high and abrupt, so that the chain *o* must pass the center of the axle *R*, the crank *b*, turned by this motion, passes its center, and gives out the chain, so as to allow the guards to turn back freely, and in this position the finger-bar will pass a stump or a rock without injury. The chain *o* also acts positively to bring the finger-bar back instantly into position after passing any obstacle.

The finger-bar may also be elevated at will, by the operator in his seat, by pressing with his foot on the projection *a* of the foot-lever *r*, which is connected to the axle *R* by the connecting-arm *c* and the projecting arm *s*, Fig. 3. Thus the force exerted by the foot acts in conjunction with the operator's weight, and the finger-bar is quickly elevated.

By means of the hand-lever *e* and the pivots *a*² *a*² the finger-bar is folded lengthwise of the mower. (Seen in Fig. 3.) Thus a tree or other high obstacle is readily passed without turning out, thus making all straight swaths.

The operator in his seat may also, by the hand-lever *e*, unfold the finger-bar, and releasing the foot-lever from pressure, the finger-bar will, of its own weight, fall instantly into position to operate.

When the finger-bar is elevated at the proper point to fold, the cutter-bar is thrown out of gear by the action of the projection *g* on the seat-spring *C*, so that it may be folded without injury to the propelling parts. The start *g* on the spring *C*, by the movement of the seat *S*, comes in contact with the shipper *h*, which acts on the clutch *3'*, and instantly disengages it from the bevel-gear *l*, and the moving parts are instantly thrown out of gear at the proper time without any attention from the operator. It may also be thrown out of gear at the will of the operator, by pressing with his foot on that arm of the shipper next the bevel-gear *l*. (Seen in Figs. 2 and 4.)

The guide *v*, being constructed of a rod, and being elevated above the cutter-bar, is less liable to be injured or clogged by the grit and dirt than commonly-constructed guides now in use.

The common flat guides form a receptacle

for the grit and dirt to lodge in, and, being in the same plane with the cutters, are much more liable to get into the grit, and require much oil and attention to keep them lubricated.

It will be seen that the above device is constructed with less weight of iron, and at less cost, and making a more desirable guide for the joint, more removed from grit, and requiring less lubricating. (Seen in Fig. 2.)

By attaching the pitman at a point which is nearly in a right line with the crank-pin and the center of the cutter-bar, the upward and downward forces of the crank on the pitman and cutter-bar joint are greatly diminished; consequently the force necessary to propel the cutter-bar is less, and there is less strain and friction on the guide.

The self-oiling box *m*, having a large chamber, *w*, to reserve the oil, the wrist is more sure to be lubricated, and as the oil-chamber entirely surrounds the wrist, and the two half-cylinders that form the internal box being packed at the end *t*, and being provided with wicks *f f*, the oil is held for a longer time in the box, and the oil will pass through the joints of the internal box, and the cotton or other suitable substance will supply the wrist as long as there is oil in the chamber *W*. (Seen in Figs. 5, 6, and 8.)

When the internal box *z z* becomes worn, it may be tightened up by means of the set-screw 12, Fig. 5, and when worn out may readily be replaced at a small expense.

The flexible joints of the box *m* allow the pitman *d* to play freely in any position of the cutter-bar *E'* when in gear. The pitman *d*, being made of a hollow tube, is stronger and stiffer, for the same amount of material, than a solid rod; and as this weight is moved very rapidly, a small difference in the weight is of great importance.

By the above device, it will be seen that a mowing-machine will pass high abrupt obstacles without any attention from the operator, with no injury to the machine; consequently they may be constructed with less weight of material, rendering them lighter.

The operator also in his seat, having complete management of the finger-bar, may elevate, fold, and unfold it at will, with ease, and a tree or any obstacle that is in the swath may be passed, thus keeping the swaths straight.

It will also be seen that when the finger-bar is folded the fingers and cutters point downward, thus rendering them entirely secure from injury to the guards by obstacles, or to the team by accidentally backing onto them, as is liable to occur when the cutter-bar is folded with the fingers and cutters pointing forward; also, by means of the above improvement, the liability of the operator being thrown from the seat, by the machine being suddenly stopped when in motion, by coming in contact with an obstacle, is entirely overcome. Thus many serious accidents are entirely avoided, which often occur to the op-

erators of machines of the usual construction, and as the machine is almost automatic in its operation, it is very easily managed, and does not require experts to develop its utility.

What I claim as my invention, and desire to secure by Letters Patent, is—

1. The finger-bar *E*, when supported by mechanism so constructed and arranged that the finger-bar will yield to and pass over firm and abrupt obstacles without arresting the team or injuring the machine, substantially as described.

2. The seat *S*, when supported by mechanism so arranged that the operator's weight in the seat shall tend to hold the finger-bar in position while operating, substantially as described, and for the purpose set forth.

3. The finger-bar *E*, when connected with the foot-lever *r* and hand-lever *e* in such a manner that the bar may be folded or unfolded by the operator while in the seat, substantially as described, for the purposes set forth.

4. The shipper *h*, when so arranged and connected with the finger-bar that the cutter-bar is thrown out of gear when the finger-bar is elevated, substantially as described.

5. The combination of the finger-beam, the foot-lever *r*, the crank *b*, and the elevating-chain *o*, when said chain is so arranged as to pass over the turning center of the crank *b*, so that the chain shall at first raise the finger-bar, and then, by slackening, allow the points of the fingers to be lowered, substantially as described and set forth.

6. The combination of the finger-beam, the foot-lever *r*, crank *b*, and chain *o*, for the purpose of lifting the finger-bar over slight obstructions, while keeping it nearly parallel to the ground, substantially as shown and described.

7. The combination of the seat *S*, spring *C*, arm *j*, the connection *y*, and the arm *e'* with the axle *R*, pivoted and arranged substantially as described, and for the purpose set forth.

8. The seat-spring *C*, the projecting arm *g*, and the shipper *h*, in combination with the clutch *3'* and spring *2*, arranged substantially as described, and for the purpose set forth.

9. The hanger *D*, the ring *x*, and the finger-bar *E*, in combination with the shaft *R*, connected and arranged substantially as described, and for the purpose set forth.

10. The combination of the projecting arm *s*, the connecting-arm *c*, and the lever *r*, substantially as described, for the purpose set forth.

11. The combination of the pitman *d*, the guide *v*, the standard *M*, and the cutter-bar *E'*, substantially as described.

GEORGE E. BURT.

Witnesses:

E. A. HILDRETH,
S. B. HILDRETH.