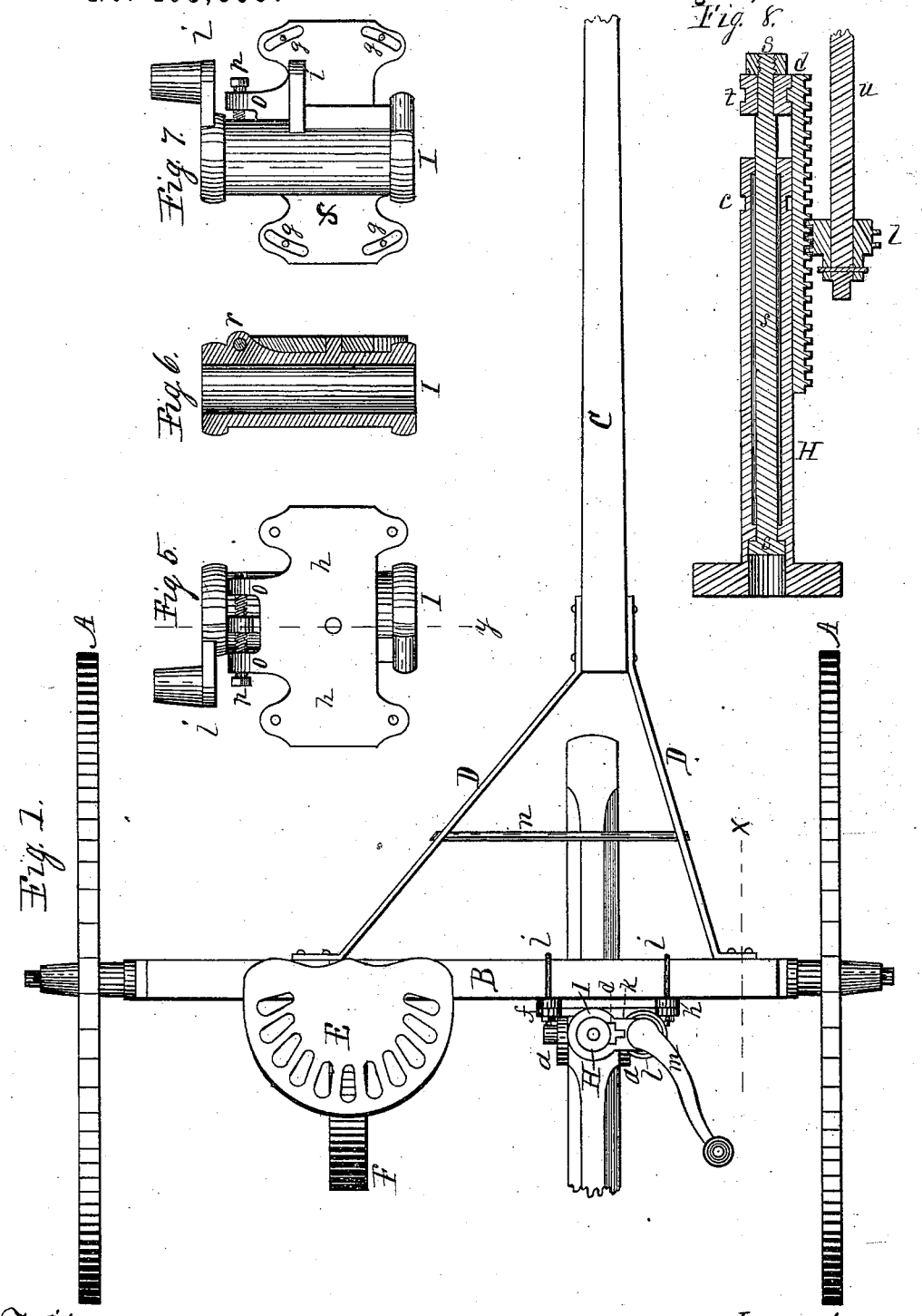
2 Sheets—Sheet 1.

G. H. SMITH.

SULKY-PLOWS.

No. 193,899. Patented Aug. 7, 1877.



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2 Sheets—Sheet 2.

G. H. SMITH.

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Fig. 2.

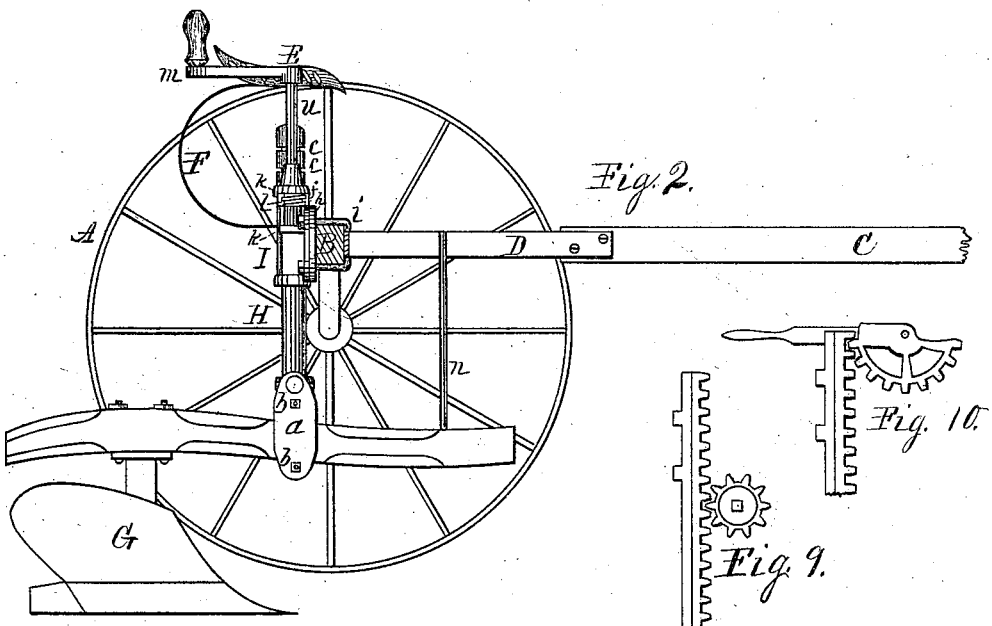


Fig. 10.

Fig. 9.

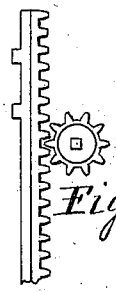
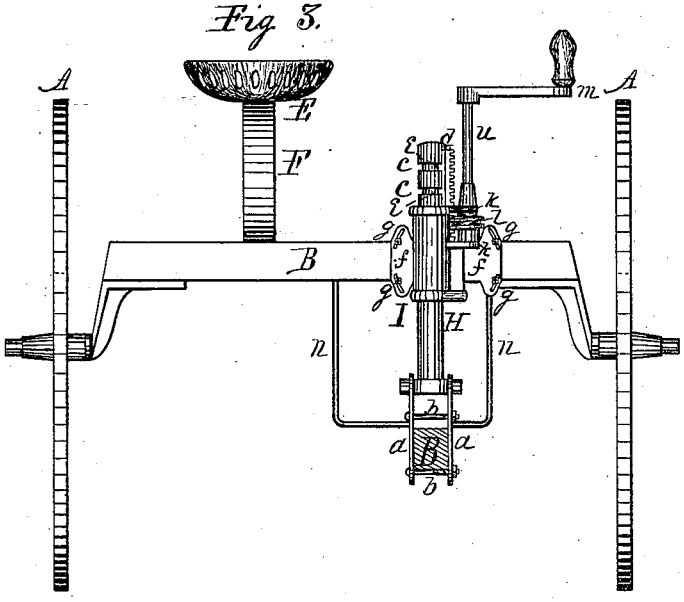


Fig 3.



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UNITED STATES PATENT OFFICE.

GEORGE H. SMITH, OF ROCKFORD, ILLINOIS.

IMPROVEMENT IN SULKY-PLOWS.

Specification forming part of Letters Patent No. **193,859**, dated August 7, 1877; application filed June 7, 1877.

To all whom it may concern:

Be it known that I, GEORGE H. SMITH, of the city of Rockford, in the county of Winnebago and State of Illinois, have invented a new and useful Improvement in Sulky-Plows, which improvement is fully set forth in the following specification and accompanying drawings, in which—

Figure 1 is a plan view of my improved sulky. Fig. 2 is a side elevation on dotted line *x x*, Fig. 1. Fig. 3 is a rear elevation; and Figs. 5, 6, 7, 8, 9, and 10 are modified forms of the devices which connect the plow to the sulky, and of the raising and lowering devices.

The object of my invention is more especially to improve the sulky-plow in those parts employed to connect the plow to the sulky, and in the raising and lowering devices; also, in the devices employed to adjust the plow laterally, and to level it properly.

To this end I have devised and constructed the machine represented in the drawings, in which—

A represents the carrying-wheels, fitted to revolve on axle-arms secured to the axle-tree B. C is a pole or tongue, connected to the axle-tree by means of oblique bars D, secured to the tongue and axle-tree. E represents the driver's seat, supported on the curved spring F, secured to the axle-tree. These parts constitute the sulky, which is substantially the same as some sulkies now in use. G represents a plow substantially the same as plows now in use.

Clamping-plates *a* are secured to the plow-beam by means of clamping-bolts *b*, which pass through them, below and above the beam, and are made adjustable lengthwise on the beam, for the purpose of balancing the plow. The upper ends of these clamping-plates are connected to the lower ends of the shaft H by hinge-joint on trunnions projecting laterally from a collar on the lower end of the shaft, in such a manner as to permit of a free up-and-down rocking movement of the plow when the shaft H is held in a vertical position.

The shaft H is provided with annular grooves *c*, and is fitted to oscillate and slide lengthwise freely in the socket I. This socket is grooved lengthwise on its inner surface to receive a toothed rack, *d*, which is fitted to the side of the shaft H, and is provided with flanges *e*, which enter the annular grooves in such a manner that the shaft H will be free to oscillate or turn in the tube independent of the rack, to permit the plow to swing laterally.

The tubular socket I is fitted with a transverse bed-plate, *f*, having its outer corners provided with curved slots, as at *g*. *h* is a bed-plate, of substantially the same outline form as plate *f*, and is fitted with holes in its corners to coincide centrally with the slots *g* in plate *f*. These bed-plates are placed on each other, pivoted in such a manner as to oscillate on their common center, and are placed against the rear face of the axle-tree, to which they are secured in place by means of staple screw-bolts *i*, which span the axle-tree, and pass through the holes in the bed-plate *h*, and through the curved slots *g* in the bed-plate *f*, and by means of the screw-nuts on their threaded ends the bed-plates are clasped against the axle-tree to hold the tubular socket in position thereon. By means of these devices the socket I is made adjustable lengthwise on the axle-tree, for the purpose of adapting the sulky to the use of plows cutting furrows differing in width, and the socket can be inclined from a vertical position to either side, for the purpose of leveling the plow, all of which is accomplished by means of the staple screw-bolts and the slotted and pivoted bed-plates.

The socket I is provided with projecting ears *k*, which furnish bearings for the journals of the crank-shaft *u*, on which is mounted a screw-gear, *l*, the spiral thread of which engages the teeth in the rack *d*.

The shaft *u* is fitted with a hand-crank, *m*, in convenient position to the driver's seat, through which rotary motion is imparted to the screw-gear mounted on the shaft, and, by means of its connection with the rack *d* and shaft H, will cause them and the plow attached to the shaft H to move up or down as the crank is turned to the right or left.

n is a depending stirrup, fixed in the sulky-frame in position to overlap the forward end of the plow-beam.

By means of the hand-crank and its connection with the plow the operator can control its

running depth, which may be lessened or increased while in motion by turning the hand-crank to the right or left.

In raising the plow for the purpose of turning at the ends, or for transportation, the depending stirrup *n* serves as a fulcrum, against which the forward end of the beam rests, and the further turning of the hand-crank will cause the plow to rise more rapidly and hold it suspended.

Fig. 5 is an elevation of the socket I and the bed-plate, showing the front side, which is placed against the rear face of the axle-tree. Fig. 6 is a section on dotted line *y y* of Fig. 5, and Fig. 7 is a rear face elevation. In these figures I have shown upward-projecting ears *o* on bed-plate *h*, which are provided with holes to freely admit an adjusting-bolt, *p*, held in place by a pin passing through its end outside of the ear.

The center part of bolt *p* is screw-threaded, and is fitted to enter a screw-threaded hole in the central ear *r*, which projects from the front side of the socket I.

By means of an adjusting-screw, substantially as described, the socket I may be inclined to either side to level the plow.

Fig. 8 is a vertical central section, showing a modified form of the raising and lowering devices, in which the shaft H is of tubular form to receive the bolt *s*, fitted at its upper end, a proper distance above the shaft, with an annular grooved washer, *t*, held in place on the bolt by a screw-nut, in such a manner as to permit of a limited vertical movement of the shaft on the bolt independent of the other parts. In this form the toothed rack is connected to the washer *t* by means of a flange entering the annular groove. The object of this form is to permit the sulky in plowing to pass over obstructions or abrupt undulations without materially affecting the running depth of the plow. The flange on the tooth-rack may be changed from the groove in the washer to the groove in the upper end of the shaft H, which will cause the shaft and toothed rack to move in unison.

In Figs. 9 and 10 I have represented two forms of the rack-and-pinion movement, which may be employed to raise and lower the plow instead of the screw-gear hereinbefore described, which will be understood from the drawings without further description.

I claim as my invention—

1. The herein-described screw-gear *u l*, toothed rack *d*, socket I, and shaft H, having annular grooves *c* and swiveled trunnion-plates at its lower end, in combination with a plow-beam, for the purpose of raising and lowering the plow thereto attached, to regulate its working depth and hold it suspended for transportation, as hereinbefore set forth.

2. In combination with a plow-beam having a plow thereto attached, the clamping-plates *a*, shaft H, toothed rack *d*, and socket I, to admit of a vertical rocking movement and a lateral oscillatory or swinging movement of the plow, as and for the purpose hereinbefore set forth.

3. The socket I, with slotted bed-plate *f*, fitted with shaft H, capable of an oscillatory and a vertical movement in the socket, with plow thereto attached, pivoted to the bed-plate *h*, in combination with the axle-tree, to incline the socket from a vertical position to either side to level the plow, as hereinbefore set forth.

GEORGE H. SMITH.

Witnesses:
C. C. JONES,
WM. A. KNOWLTON.