(No Model.) 3 Sheets—Sheet 1.

C. L. COATES.

SNOW PLOW.

No. 552,891. Patented Jan. 14, 1896.

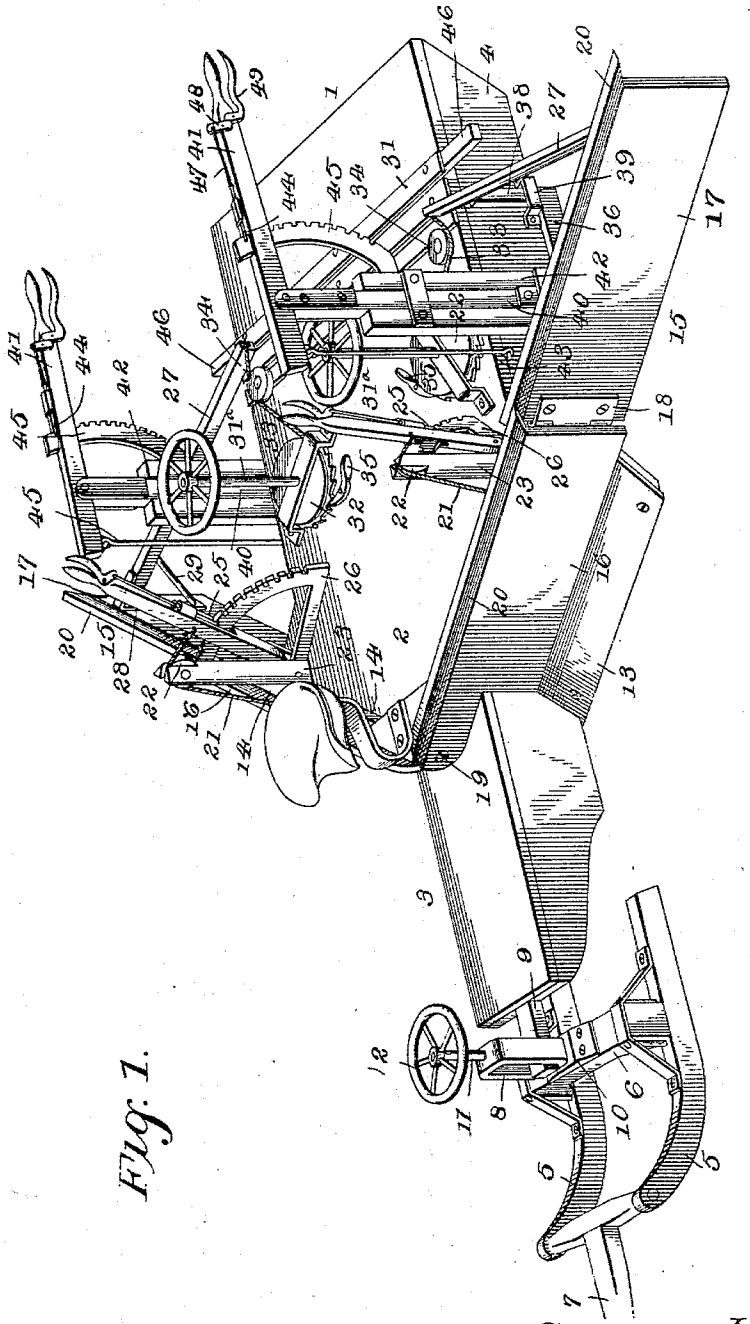

Fig. 1.

Inventor
Clarence L. Coates

Witnesses
Chas. A. Ford.
T. F. Riley

By his Attorneys.
C. A. Snow & Co.

(No Model.) 3 Sheets—Sheet 2.

C. L. COATES.

SNOW PLOW.

No. 552,891. Patented Jan. 14, 1896.

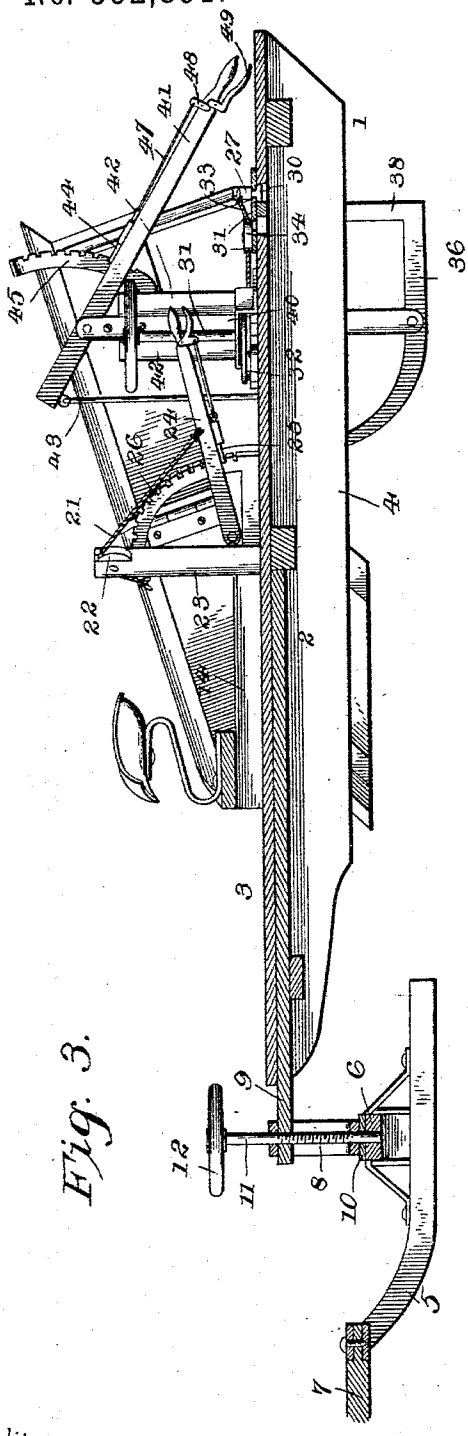

Fig. 3.

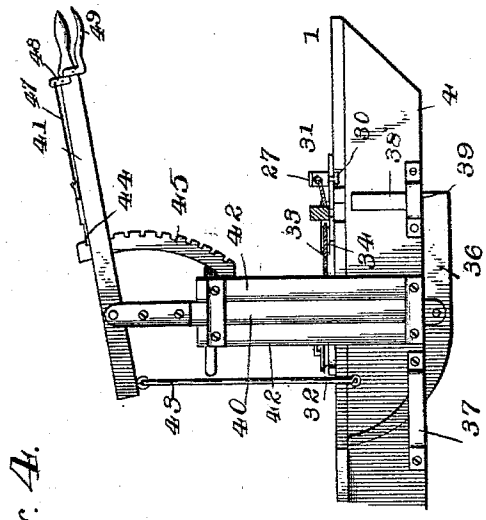

Fig. 4.

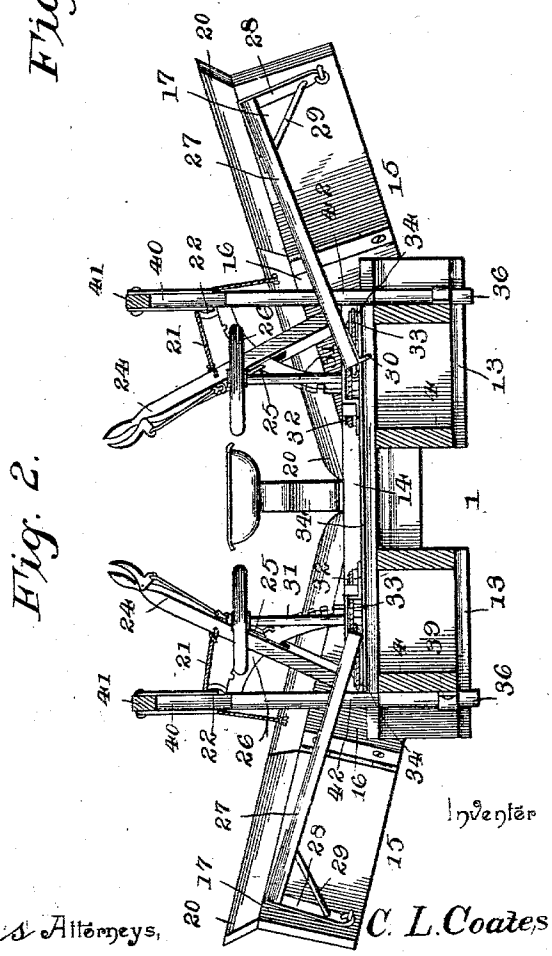

Fig. 2.

Witnesses

Chas. A. Ford.

T. F. Riley

Inventor

By his Attorneys,

C. L. Coates

C. A. Snow & Co.

(No Model.) 3 Sheets—Sheet 3.

C. L. COATES.

SNOW PLOW.

No. 552,891. Patented Jan. 14, 1896.

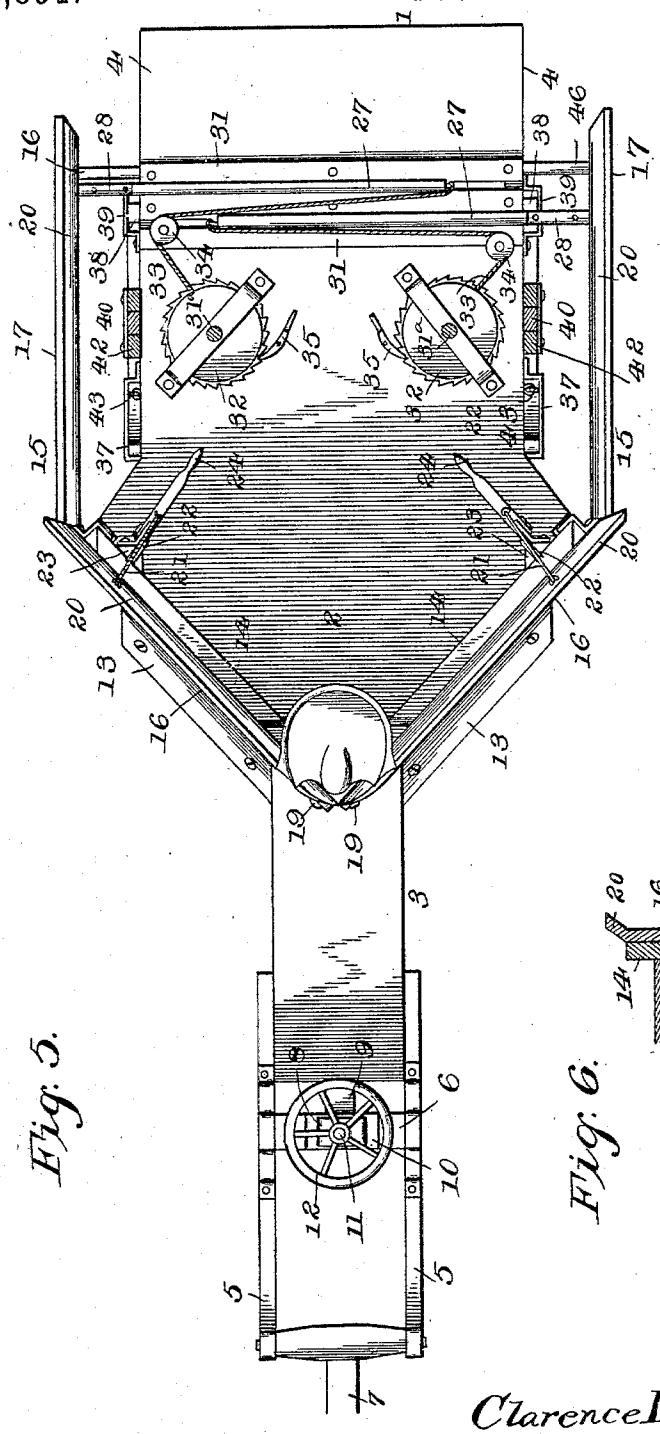

Fig. 5.

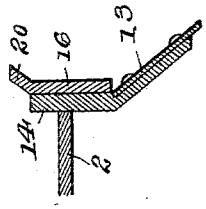

Fig. 6.

Witnesses
Chas. A. Ford.
F. C. J. Riley

Inventor
Clarence L. Coates

By his Attorneys.
C. A. Snow & Co.

UNITED STATES PATENT OFFICE.

CLARENCE L. COATES, OF BRIDGEWATER, VERMONT.

SNOW-PLOW.

SPECIFICATION forming part of Letters Patent No. 552,891, dated January 14, 1896.

Application filed May 9, 1895. Serial No. 548,746. (No model.)

To all whom it may concern:

Be it known that I, CLARENCE L. COATES, a citizen of the United States, residing at Bridgewater, in the county of Windsor and State of Vermont, have invented a new and useful Snow-Plow, of which the following is a specification.

The invention relates to improvements in snow-plows.

The object of the present invention is to provide a simple and comparatively inexpensive snow-plow designed for clearing highways and adapted to be drawn by draft-animals and capable of ready adjustment to adapt the clearing devices to the width of a road and to enable them to be readily brought into and out of operation at either side of the plow.

The invention consists in the construction and novel combination and arrangement of parts, hereinafter fully described, illustrated in the accompanying drawings, and pointed out in the claims hereto appended.

In the drawings, Figure 1 is a perspective view of a snow-plow constructed in accordance with this invention. Fig. 2 is a transverse sectional view. Fig. 3 is a longitudinal sectional view. Fig. 4 is a side view, the wings being removed to show the construction of the vertically-adjustable side runners. Fig. 5 is a plan view partly in section. Fig. 6 is a detail sectional view of one of the cutters and the adjacent wing.

Like numerals of reference indicate corresponding parts in all the figures of the drawings.

1 designates a plow-frame provided with a tapered front portion 2, and having a substantially rectangular extension 3, projecting forward from the tapered front portion 2, and the frame is composed of parallel longitudinal beams 4, suitably connected and braced, and provided with a platform or covering of suitable material.

The front of the plow-frame is supported by a bob-sled 5, composed of opposite runners and a connecting cross-piece 6, and having a pole pivotally connected to the front terminals of the runners 5. The cross-bar 6 of the bob-sled has mounted upon it a vertically-disposed rectangular frame or keeper 8, which is swiveled to the cross-bar 6, and which receives a draft-bar 9 of the plow-frame. The rectangular frame or keeper is arranged on a wear-plate 10, and has mounted in it an adjusting-screw 11, provided at its upper end with a hand-wheel 12, and passing through a threaded perforation of the draft-bar 9, and adapted to raise and lower the front of the plow-frame, whereby angularly-disposed cutters 13, which are mounted on the tapered portion of the plow-frame, may be adjusted vertically in order to cut properly.

The cutters 13 are disposed substantially at an angle of forty-five degrees, and have their front terminals separated, in order to cut a path or way at each side of the plow, and to leave a central core or ridge. The cutters are arranged at an inclination, and are provided with metal faces, and have sharpened lower edges, and they are provided with vertical upper portions 14, extending centrally above the platform or floor of the plow-frame.

The snow-plow is provided at its sides with adjustable wings 15, composed of front and rear sections 16 and 17, hinged together at their adjacent ends at 18 and located adjacent to the tapered or angularly-disposed sides of the frame, where the cutters 13 are mounted, and extending along the straight sides of the frame in rear of the cutters. The front sections of the wings 15 are pivoted at 19 at the rear terminus of the extension 3, and the vertical portions 14 of the cutters are extended inward over the plow-frame and form bearings for the front ends of the sections 16 of the wings. The sections 16 and 17 of the wings are provided at their upper edges with outwardly-inclined portions 20 for throwing the snow outward and to prevent the same from getting over the wings and falling in upon the plow-frame, and the front ends of the sections 16 are recessed at opposite sides of the extension 3, and project inward over the rear of the same to prevent snow from collecting on the plow-frame at that point.

Each wing is capable of vertical adjustment to set it properly to suit the depth of the snow to be cleared, and the front section 16 is connected to one end of a wire rope or cable 21, which passes over a pulley 22 of a post 23, and has its other end connected with an adjusting-lever 24, and the latter is fulcrumed at its

lower end at the base of the post, and is provided with a spring-actuated detent 25, arranged to engage a curved ratchet 26, on which the lever slides. The curved ratchet 26, is supported by a horizontal portion or bar extending outward from the lower end of the post and arranged on the floor or platform of the plow-frame, and the upper end of the curved ratchet is secured to the post, the lever being provided with an opening to receive the ratchet. The spring-actuated detent is operated by a latch-lever located near the handle of the operating-lever. By this construction the pivoted wings may be adjusted independently of each other and may be quickly raised and instantly brought into position to clear away a drift at one side of the plow or the other.

The wings are adjustable laterally to vary the width of the snow-plow and to enable it to adjust itself to the width of a road and to clear any obstruction. The rear sections 17 are connected to adjustable braces 27, having their inner ends mounted on and arranged to slide transversely of the plow-frame, and provided at their outer ends with angularly-disposed arms 28. The angularly-disposed arms 28 are arranged substantially at right angles to the braces and are constructed of metal, and consist each of an L-shaped piece, having one portion extended along and secured to the brace, while the other portion projects from the same to form the arm. The outer end of the arm is provided with a hook or eye, which is linked into an eye of the section 17, whereby the arm is hinged to the inner face of the same. When the section 17 of the wing is in a substantially horizontal position, the arm 28 bears flat against the inner face of the same, and as the wing is swung upward the outer end of the brace or prop 27 leaves the inner face of the section 27, swinging on the hinge of the arm 28, and the latter is supported by a bracing-rod 29.

The inner ends of the props or braces 27 are provided with T-shaped tongues 30, which are interlocked with transverse plates 31, mounted on the snow-plow frame and separated to form slots or ways for the T-shaped tongues, whereby the inner ends of the props or braces are capable of sliding across the plow-frame to swing the hinged sections 17 of the wings outward. This connection at the inner ends of the props or braces forms a hinge and permits the braces to swing upward when the wings are adjusted vertically.

The wings are operated to swing them laterally by vertical shafts 31^a, located at opposite sides of the plow-frame and journaled in suitable bearings and provided at their upper ends with hand-wheels, and grooved pulleys 32 are located at the lower ends of the shafts and are fixed to the same, and have attached to them wire ropes or cables 33, which pass around pulleys 34 and are secured to the inner ends of the braces or props 27, whereby when the cables or wire ropes are wound around the grooved pulleys 32 the props or braces 27 will be forced outward to spread the rear sections 17 of the wings. The pulleys 34 are located adjacent to the terminals of the slots formed by the transverse plates or bars, and they cause the bars or props 27 to be drawn outward. The grooved pulleys 32 are provided with ratchet-teeth and are engaged by pivoted pawls 35, mounted on the plow-frame and adapted to be readily disengaged from the ratchet-teeth of the pulleys to enable the rear sections of the wings to swing inward to pass an obstruction without injury and to adapt the plow to the width of the roadway to be cleared.

The rear portion of the plow-frame is supported by vertically-adjustable side runners 36, located at opposite sides of the plow-frame, and having upwardly-curved front portions. The front portions of the side runners 36 are loosely arranged in rectangular keepers 37, and the runners are provided at their rear ends with upwardly-extending arms 38, arranged in rectangular keepers 39. Each runner is pivotally connected intermediate of its ends to a vertically-adjustable bar 40, arranged in a vertical way or guide and adapted to be raised and lowered by an operating-lever 41. This connection or manner of mounting the runner affords the same the necessary rocking movement to conform to any inequality in the road. The vertical guide for the bar 40 is formed by a pair of vertical bars or cleats 42, secured to the plow-frame, and extending upward therefrom and connected by plates, which confine the vertically-movable bar 40 between the cleats 42. The operating-lever 41 is pivotally connected intermediate of its ends to the upper end of the bar 40. Its front end is connected by a link-rod 43 with a plow-frame and its rear end is provided with a handle. A spring-actuated detent 44 is mounted on the upper edge of each operating-lever 41 and is arranged to engage an upwardly-curved ratchet 45, passing through an opening or slot of the lever 41, and secured at its lower end to one of the cleats 42 of the guide of the vertically-adjustable bar 40. The spring-actuated detent is connected by a rod 47 with the outer end of a link 48, which is disposed transversely of the operating-lever 41, and which is fulcrumed thereon. The inner end of the link 48 is engaged by the bell-crank lever 49, fulcrumed on the operating-lever 41, adjacent to the handle portion thereof, and having one of its arms disposed longitudinally of the operating-lever and arranged adjacent to and conforming to the configuration of the handle of the operating-lever. By this arrangement the longitudinally-disposed arm of the bell-crank lever 49 is located beneath the handle of the operating-lever and is in convenient position for the operator in grasping the handle to press the bell-crank lever inward against the handle to withdraw the spring-actuated detent from its engagement with the curved ratchet, and as soon as the bell-crank lever 49 is released the spring of

the detent will return the latter into engagement with the ratchet 45.

By forcing the rear portion of the operating-lever 41 downward the adjacent side of the plow-frame is raised, as will be readily understood, and this raising or lifting of the plow-frame enables either cutter to be raised sufficiently to bring it out of operation, and the plow may be adjusted so that either, both, or neither cutter can operate. By this construction the plow may be adjusted to operate on any portion of a roadway and to cut at one or both sides of the plow.

A seat for the accommodation of the driver is mounted on the plow-frame adjacent to the front ends of the wings, and the pole 7, which is attached to the bob-sled, enables the plow to be readily turned in a short space. The inward swinging of the rear sections 17 of the wings is limited by horizontal stops 46, projecting laterally from the sides of the plow-frame, and located adjacent to the slots thereof.

It will be seen that the snow-plow is simple and comparatively inexpensive in construction, that it is easily operated, and that it is especially adapted for removing snow-drifts and the like from roads and highways. It will also be apparent that the plow may be readily adjusted to accommodate itself to the width of a roadway and to the depth of the snow to be removed, and that the parts may be thrown into and out of operation to enable any portion of a road to be operated on without operating on the entire roadway.

Changes in the form, proportion, and the minor details of construction may be resorted to without departing from the principle or sacrificing any of the advantages of this invention.

What I claim is—

1. The combination of a plow frame, the oppositely disposed snow-clearing cutters fixed to the plow frame and extending transversely from opposite sides thereof and diverging rearwardly, the vertically movable runners located in rear of the cutters at opposite sides of the plow frame and supporting the rear of the same and adapted to raise and lower the plow frame to bring the snow-clearing cutters into and out of operation, and means for securing the runners at the desired elevation, whereby the snow-clearing cutters are adjusted to the proper depth and are held out of operation, substantially as described.

2. In a snow-plow, the combination of a plow-frame having a tapered portion and provided in advance of the same with a forward extension, a bob-sled swiveled to and adjustably supporting the front of the plow-frame, the angularly disposed cutters mounted on the plow-frame and located at the tapered portion thereof, and the vertically adjustable side-runners pivotally mounted at opposite sides of the plow-frame and having a limited rocking movement, substantially as described.

3. In a snow-plow, the combination of a plow-frame provided at opposite sides with front and rear keepers, and having vertically disposed guides located between the keepers, side runners having their front terminals arranged in the front keepers and provided at their rear ends with upward extending arms located at the rear keepers and loosely fitting within the same, the vertically movable bars arranged in the guides and having their lower ends pivoted to the runners, and means for operating the bars, substantially as described.

4. In a snow-plow, the combination of a plow-frame provided at opposite sides with vertical guides, the vertically adjustable bars arranged in the guides, side runners pivoted to the lower ends of the vertically adjustable bars, levers pivoted intermediate of their ends to the upper ends of the bars, links connecting the levers with the frame of the plow, and means for locking the levers in their adjustment, substantially as described.

5. In a snow-plow, the combination of a plow-frame, the wings arranged at opposite sides of the frame, and pivoted at their front ends to the same, and adapted to be raised and lowered, each wing being composed of two sections hinged together, and means for operating the wings, substantially as described.

6. In a snow-plow, the combination of a plow-frame, the wings located at opposite sides of the frame, and composed of front and rear sections, the front sections being arranged at an angle to each other and being pivoted to the frame, and the rear sections being hinged to the front sections and arranged to swing outward laterally of the frame to vary the width of the plow, and means for operating the wings, substantially as described.

7. In a snow-plow, the combination of a plow-frame, wings pivoted to opposite sides thereof and adapted to be raised and lowered and provided with hinged rear sections and arranged to swing laterally of the plow, the opposite braces having their outer ends loosely connected with the rear sections, and having their inner ends hinged to and arranged to slide transversely of the plow-frame, and means for moving the braces outward, substantially as described.

8. In a snow-plow, the combination of a plow-frame, wings located at opposite sides thereof and provided with hinged rear sections arranged to swing transversely of the plow frame, plates or bars disposed transversely of the plow-frame and separated to form transverse slots or ways, opposite braces provided at their inner ends with tongues arranged in the slots or ways and interlocked with the plates or bars, arms located at the outer ends of the braces and hinged to the wings, and means for moving the braces outward, substantially as described.

9. In a snow-plow, the combination of a plow-frame provided with transverse ways, wings located at opposite sides of the plow-frame, and provided with hinged sections,

braces having their outer ends connected to the hinged sections of the wings and having their inner ends arranged in said ways and adapted to slide transversely of the plow-frame, pulleys located at the outer terminals of the ways, vertical shafts mounted on the plow-frame, grooved pulleys fixed to the shafts and provided with ratchet teeth, flexible connections passing around the pulleys at the outer terminals of the ways, and secured to the inner ends of the braces and attached to the grooved pulleys, and pawls for engaging the ratchet teeth of the grooved pulleys, substantially as and for the purpose described.

In testimony that I claim the foregoing as my own I have hereto affixed my signature in the presence of two witnesses.

CLARENCE L. COATES.

Witnesses:
FRANK W. SPAULDING,
CHARLES W. SMITH.