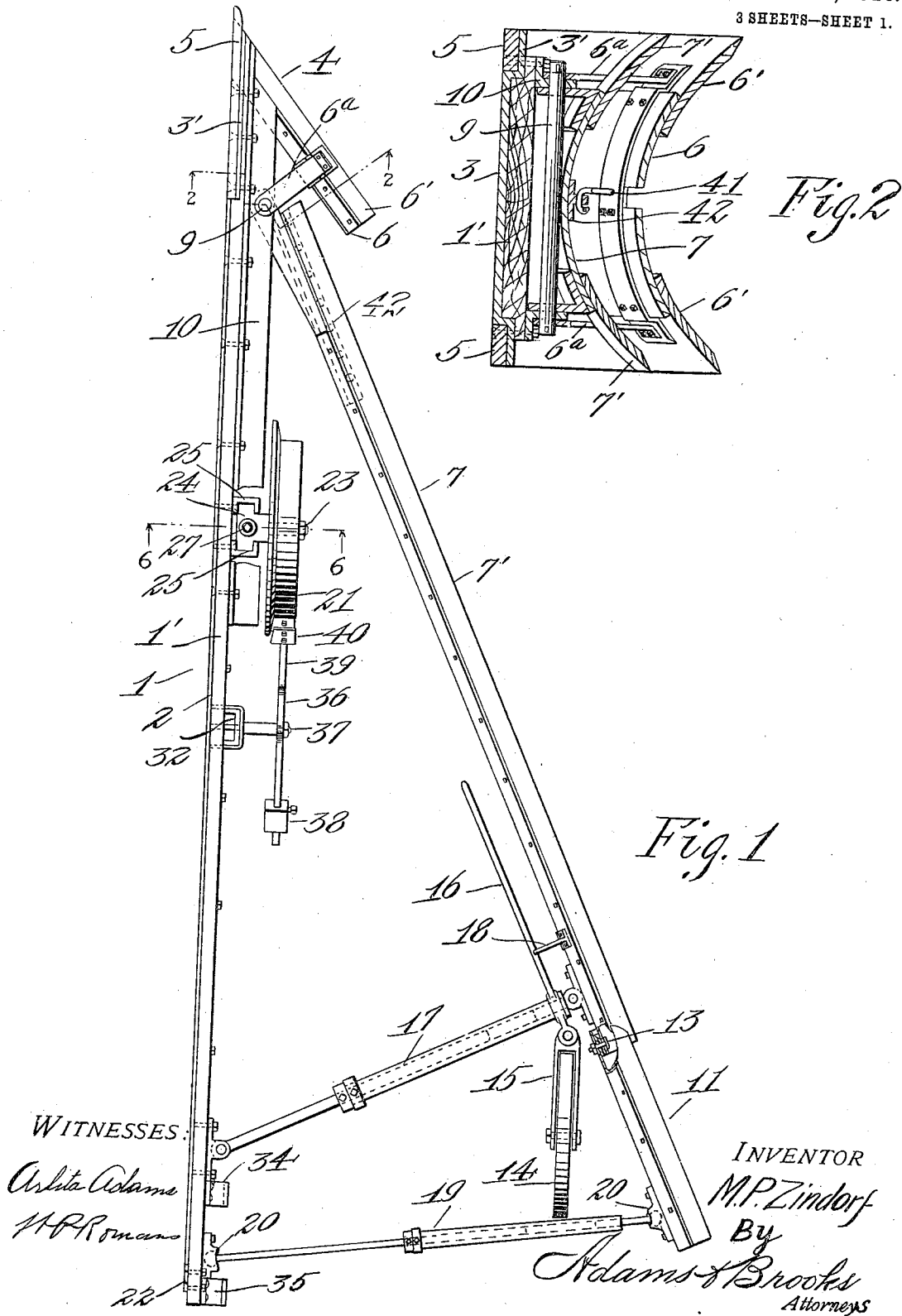


M. P. ZINDORF.
 DITCHING AND GRADING MACHINE.
 APPLICATION FILED DEC. 18, 1907. RENEWED AUG. 26, 1909.

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3 SHEETS—SHEET 1.



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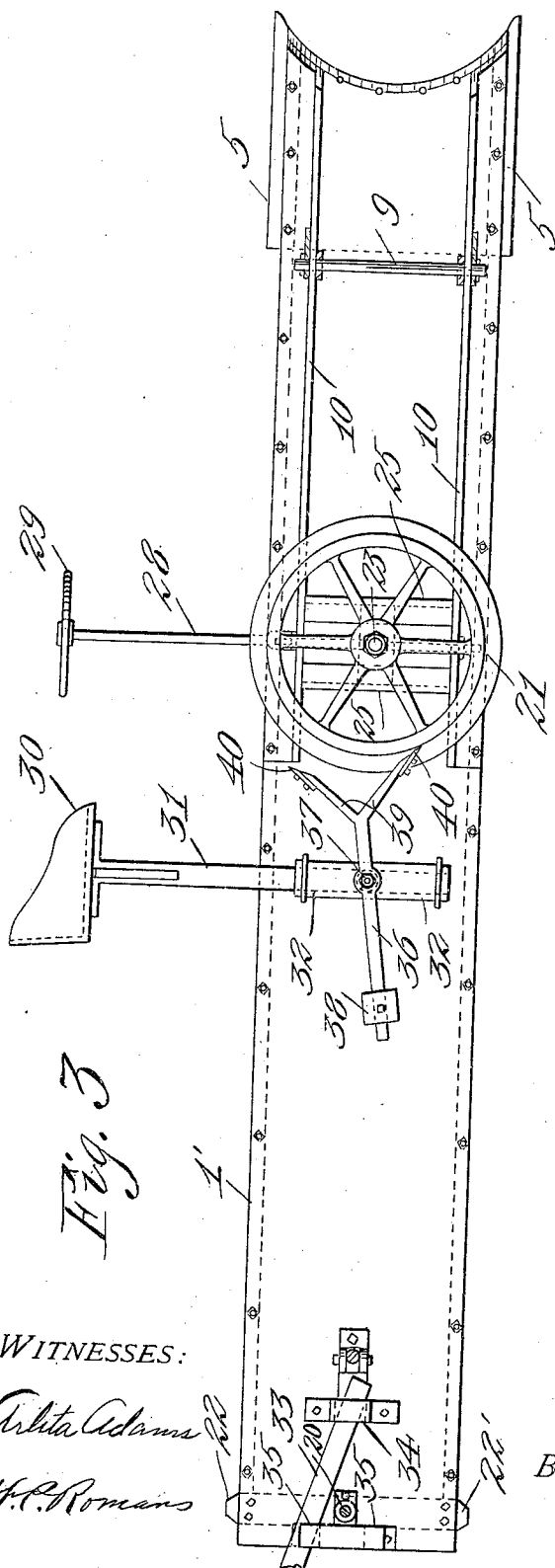


Fig. 3

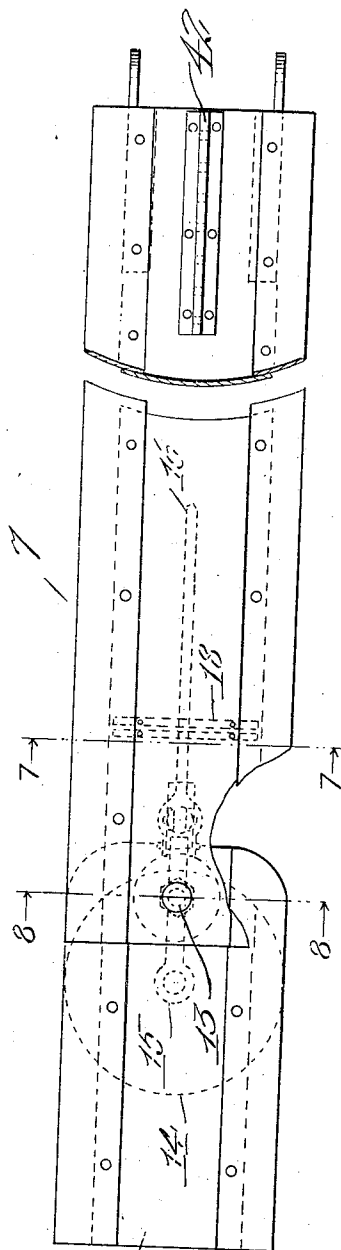


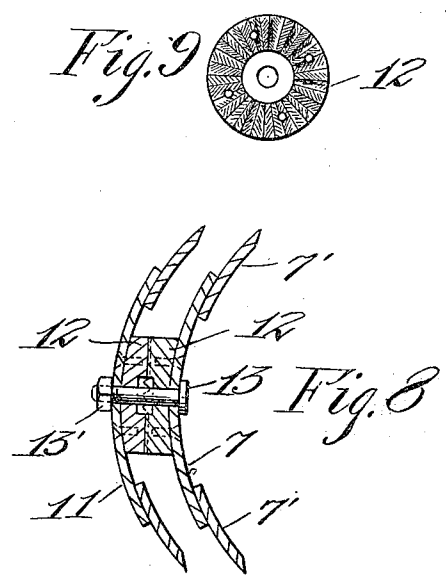
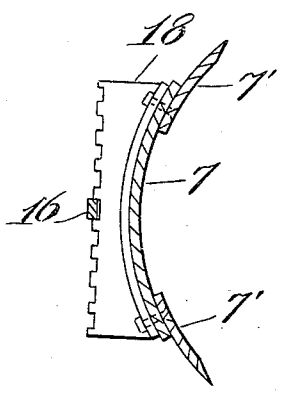
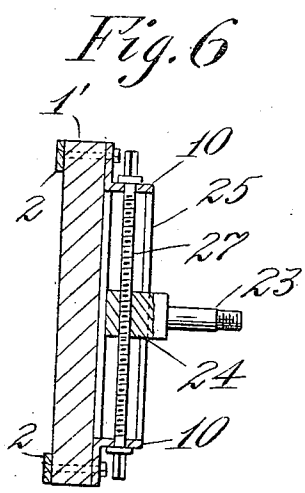
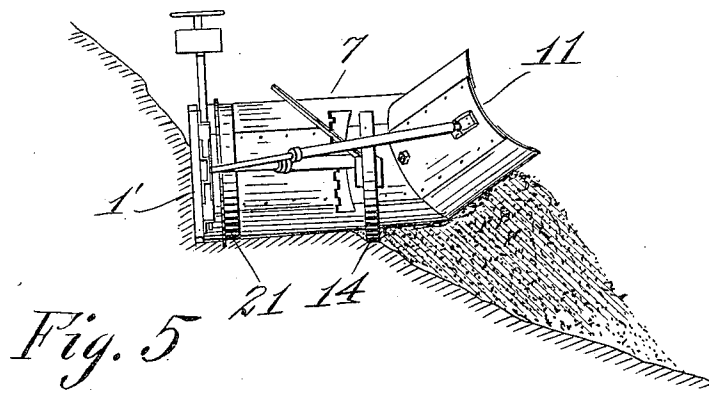
Fig. 4

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UNITED STATES PATENT OFFICE.

MATTHIAS P. ZINDORF, OF SEATTLE, WASHINGTON.

DITCHING AND GRADING MACHINE.

952,662.

Specification of Letters Patent. Patented Mar. 22, 1910.

Application filed December 18, 1907, Serial No. 407,063. Renewed August 26, 1909. Serial No. 514,810.

To all whom it may concern:

Be it known that I, MATTHIAS P. ZINDORF, a citizen of the United States of America, and a resident of the city of Seattle, in the county of King and State of Washington, have invented certain new and useful Improvements in Ditching and Grading Machines, of which the following is a specification.

My invention aims primarily to provide an improved apparatus of the above type, which while being comparatively simple in construction will operate in an efficient manner.

A further object is to provide an improved apparatus of this character, the parts of which are arranged so as to operate when said apparatus is in relatively inverted positions.

A further object resides in the provision of the mold board or grader of the apparatus with a section which can be adjusted vertically.

With the above and other objects in view, to be referred to as the description progresses, the invention resides in the features of construction, arrangement and combinations of parts hereinafter described and succinctly defined in the claims hereto annexed.

Referring now to the accompanying drawings in which like numerals of reference indicate like parts throughout: Figure 1 is a view in top plan of my improved apparatus, parts being broken away. Fig. 2 is a section taken on line 2—2 of Fig. 1. Fig. 3 is a side elevation showing more particularly the frame or landside of the apparatus, the mold board of the apparatus and a portion of the plow being removed. Fig. 4 is a fragmentary view in side elevation of the mold board of the apparatus removed. Fig. 5 is a view in rear elevation showing my apparatus in operation. Fig. 6 is a section taken on line 6—6 of Fig. 1. Fig. 7 is a section taken on line 7—7 of Fig. 4. Fig. 8 is a section taken on line 8—8 of Fig. 4, and Fig. 9 is a detail plan view of one of the toothed sections of the adjustable connection between the mold board of the apparatus and the adjustable end section thereof.

In carrying out my invention, I provide a frame, as now considered, consisting of a landside, as 1, which preferably comprises a comparatively light body 1', of wood or other suitable material, provided at its up-

per and lower longitudinal edges with shoes 2, the upper of which is arranged for operation when said landside 1 is inverted.

The forward end portion of the body 1' of landside 1 is cut out at its upper and lower portions (see Fig. 2) to accommodate the angular upper edge portions 3' of colter 3 of the plow 4, said colter consisting of a metallic plate secured to the outer side face of said landside and projecting beyond the adjacent longitudinal edges of said landside.

Reference numeral 5 indicates the points of the plow, the same consisting of suitable bars of metal secured in seats on colter 3, provided by the angular offset portions 3' thereof. The forward or cutting edge of colter 3 is preferably curved as illustrated.

Reference numeral 6 indicates the mold board of the plow, which is disposed at an acute angle relatively to landside 1 and firmly braced by suitable means as bars 6^a. Mold board 6 is curved longitudinally so that its outer face will be concaved, and is provided at its upper and lower edges with suitable scrapers 6'.

7 indicates the mold board of the apparatus which constitutes the grader the same being normally arranged obliquely of the path of travel of the apparatus to cause the material loosened by plow 4 to travel in a lateral direction, and being hinged at its forward end by a pivot bolt 9, secured in suitable reinforcing angle bars 10, of landside 1, whereby said mold board can be adjusted horizontally by swinging toward and from the landside 1, as will readily be understood. The mold board 7 whose outer face is concaved in a manner similar to the mold board of the plow, is provided at its upper and lower edges with blades 7'.

Reference numeral 11 indicates an auxiliary grading and scraping means, the same being similar in construction to mold board 7, although much shorter (see Figs. 1 and 4) and being pivotally connected to the rear end portion thereof so as to constitute an adjustable end section. As now considered, the connection between mold board 7 and the adjustable section 11 thereof, comprises members 12, one fixed to the mold board and the other to section 11, through which a bolt 13 passes. Members 12 are provided on their contiguous faces with interlocking teeth, as shown in Figs. 8 and 9 which serve to prevent accidental displacement of section 11 from its adjusted position, when nut 13'

on bolt 13 has been moved to secure members 12 from movement away from one another.

Reference numeral 14 indicates a wheel journaled in a frame 15 which is connected to a lever 16, fulcrumed on a brace 17, pivotally connected to mold board 7 preferably at its rear portion and to landside 1. Lever 16 upon being properly moved by the operator, will raise the rear end of mold board 7 on said wheel 14, whereby the material conveyed or shoved by said mold board can be dropped when desired, or by holding said mold board in an inclined position, with its rear end elevated, the ground can be graded so as to slope toward the landside. During an operation of the character just described, lever 16 is preferably engaged with a rack bar 18 to hold the mold board securely in its adjusted position. Brace 17 in the present embodiment of my invention, consists of telescoping sections (see Fig. 1) which may be secured as adjusted in any desired manner. Another brace as 19, formed of telescoping sections extends between landside 1 and the adjustable mold board section 11 and is connected to the same preferably by universal joints 20 of the ball and socket type, as illustrated.

Reference numeral 21 indicates a suitably flanged wheel, the flange of which sinking into the earth acts with rudders 22, 22' and with the lower longitudinal edge portion of landside 1 to hold the apparatus against lateral shifting during its forward movement. Wheel 21 is journaled on an axle 23, fixed to a head 24 which is vertically slidable in a suitable housing fixed to landside 1, said housing comprising opposite channel bars 25 and upper and lower walls formed by bars 10. A screw 27 with which head 24 has threaded engagement, is supported for rotation in the upper and lower walls of said housing and said screw preferably has its opposite ends formed angular in cross section, for alternate engagement with an operating means 28, conveniently consisting of a rod formed in its lower portion with a socket, similar in construction to a socket wrench, and provided on its upper end with a hand wheel 29.

Reference numeral 30 indicates the driver's seat, the same being fixed to a post 31, insertible into either of the sockets 32.

Reference numeral 33 indicates a lever projecting rearwardly of the apparatus, through the medium of which the rear end of landside 1 can be lowered to elevate the plow, when desired, said lever having its inner end engaged in a socket 34, and in one of the seats 35, the other of said seats being engaged by said lever when the apparatus is inverted, as is obvious.

In the present embodiment of my invention, I provide scraper means of novel construction for wheel 21, said scraper means

comprising an arm 36, fulcrumed at 37 and having its outer end weighted, as by an adjustable weight 38. The inner end of arm 36 is provided with diverging arms 39, provided with suitable scrapers 40, the lower of which is held in engagement with wheel 21 at the upwardly moving side thereof by weight 38. The upper of said scrapers 40 remains inactive until the apparatus is inverted when weight 38 moves it into engagement with the wheel, as will readily be understood.

In operation, the adjustable mold board section 11, can if desired be arranged in horizontal alinement with mold board 7. It is often desirable, however, as in the building of roads and ditches and especially in operating on hillsides that an embankment be formed at the outer side, and to accomplish this object, mold board section 11 is adjusted as shown in Fig. 5 so that its rear end will be elevated. When section 11 is in this position it controls the material traveling from said mold board 7 so as to by dropping some and causing the remainder to travel upwardly to produce the desired slope to the embankment. In this kind of work the material must be thrown to the same side of the apparatus during traveling thereof in opposite directions and it is with this primary object in view that I construct the apparatus so that it will operate when in relatively inverted positions. Now, assuming that the apparatus has operated in one direction over the road or land to be graded or ditched prior to starting back seat post 31 and operating means 28 are both removed, then the apparatus is inverted. Seat post 31 is then engaged in the other or now upper socket 32 and operating means 28 is engaged with the upper end of screw 27. Mold board section 11 and wheel 14 can be adjusted to operate in an equally efficient manner when the apparatus is in this inverted position. As now considered, the draft connection is in the form of a hook 41, adapted to be engaged in any of the openings of suitably apertured bar 42 secured to mold board 7.

Having thus fully described my invention, what I claim as new and desire to secure by Letters Patent of the United States, is:

1. An apparatus of the character described comprising a frame, a plow secured thereto, a grader hinged to said frame for angular adjustment relatively to the path of travel, and an auxiliary grader at the rear end of said first grader connected for vertical adjustment independently of said first named grader.

2. An apparatus of the character described comprising a frame, means for cutting and loosening the earth, a grading means supported on said frame obliquely of

the path of travel thereof for engagement with the earth loosened by said first means, and an auxiliary grading means extending beyond the rear end of said first grading means and being supported for swinging vertically independently thereof.

3. An apparatus of the character described comprising a frame, means for cutting and loosening the earth, a grading means supported on said frame obliquely of the path of travel thereof for engagement with the material loosened by said first means, and an auxiliary grading means projecting beyond the rear end of said first grading means and forming an extension thereof, said auxiliary grading means being supported for vertical adjustment independently of said first grading means.

4. An apparatus of the character described comprising a frame, means on said frame for cutting and loosening the earth, a grading means supported on said frame obliquely of the path of travel thereof for engagement with the material loosened by said first means, and an auxiliary grading means hinged to the rear end portion of said first named grading means for vertical swinging independently thereof.

5. An apparatus of the character described comprising a frame, means thereon for loosening the earth, an obliquely disposed means secured to said frame for effecting lateral movement of the material loosened by said first means, said last means having at its rear end a section hinged for vertical swinging, and means for securing the hinged section of said obliquely disposed means as adjusted.

6. An apparatus of the character described comprising an invertible frame, means thereon for loosening the earth when said frame is in relatively inverted positions, and an obliquely disposed means secured to said frame for effecting lateral movement of the material loosened by said first means, said last named means having at its rear end a section hinged for vertical swinging.

7. An apparatus of the character described comprising a landside, means at the forward end thereof for loosening the earth, an obliquely disposed means for effecting lateral movement of the material loosened by said first means, said last means being hinged at its forward end for horizontal swinging, an adjustable section hinged to the rear end portion of said last named means for vertical swinging, and means for securing said last means against swinging.

8. An apparatus of the character described comprising a landside provided at its forward end with a cutter, upper and lower points projecting forwardly of the cutter on said landside, the upper of said points being arranged to operate when said landside is inverted, a mold board secured to one side of said landside adjacent the cutter thereof, said mold board having upper and lower scraping parts, and means for conveying the loosened material laterally of the path of travel of said landside, said last means being hinged at its forward end to the rear of said mold board, and means for securing said last means against swinging.

9. In an apparatus of the character described, an invertible frame provided with grading means, a wheel, an axle on which said wheel is journaled, and means connected to said axle for raising and lowering said frame, said last means being operable from above and below said axle.

10. In an apparatus of the character described, an invertible frame provided with grading means, a wheel, an axle on which said wheel is journaled, a head to which said axle is fixed, said head being connected to said frame so that the same can be adjusted vertically, and means connected to said head and to said frame for elevating and lowering said frame, said means being arranged to be operated from both above and below said head.

11. In an apparatus of the character described, in combination with the frame and a supporting wheel therefor, a scraper for said wheel, a pivoted arm carrying said scraper on one of its ends, and a weight on the other end of said arm.

12. A wheel scraper comprising an arm provided at one end with a weight, and diverging arms on the other end of said first named arm provided with scrapers.

13. In an apparatus of the character described, an invertible frame, a flanged guide wheel for said frame supported for vertical adjustment, and scraping means comprising an arm pivoted to said frame and having its outer end weighted, and scrapers on the inner end of said arm arranged to be alternately engaged with said wheel.

Signed at Seattle, Washington this 10th day of December 1907.

MATTHIAS P. ZINDORF.

Witnesses:

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STEPHEN A. BROOKS.