No. 845,969. PATENTED MAR. 5, 1907.

A. W. McBLAIN.

ROAD GRADER.

APPLICATION FILED JUNE 18, 1906.

2 SHEETS—SHEET 1

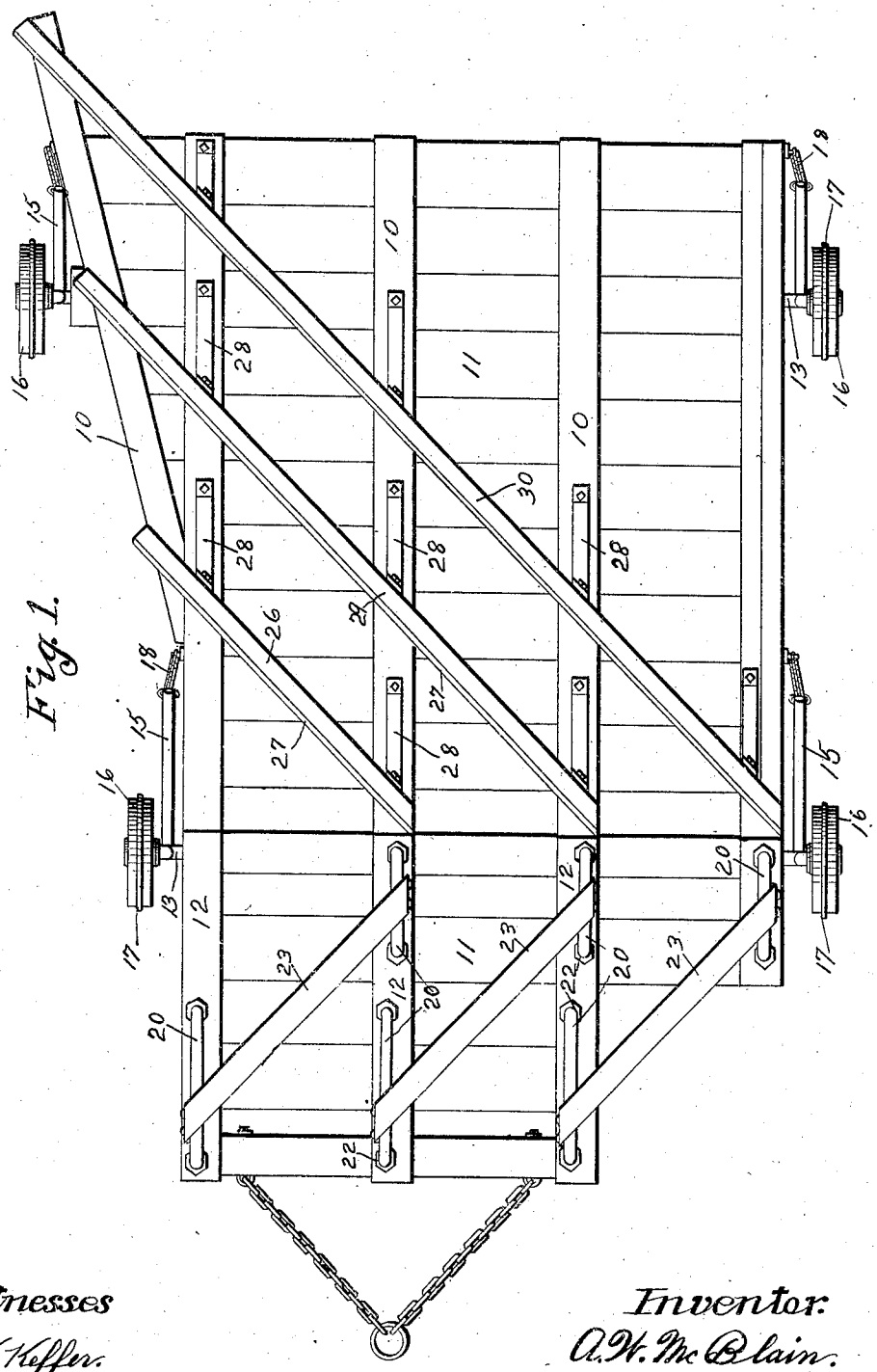

Fig. 1.

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Fig. 4.

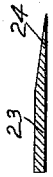


Fig. 2.

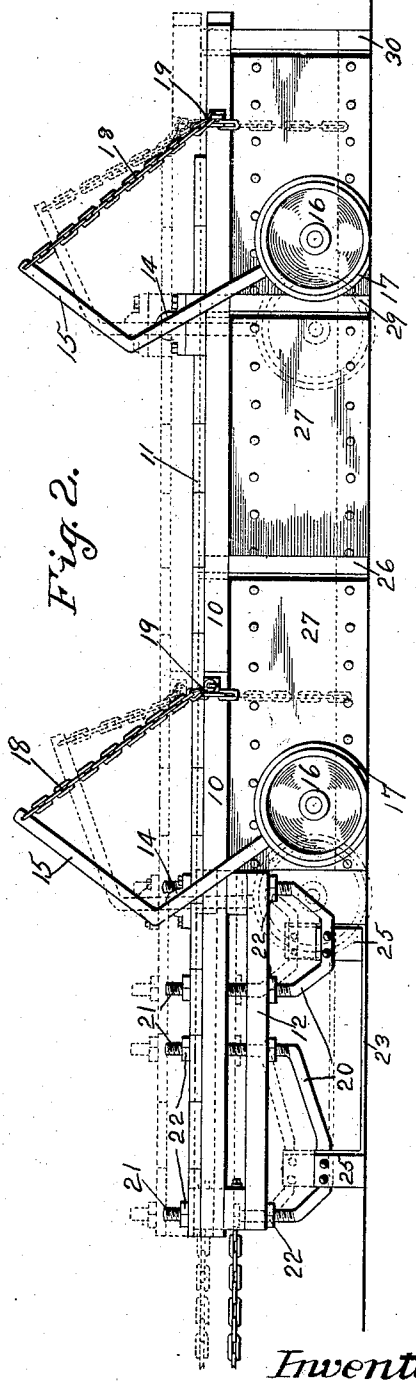
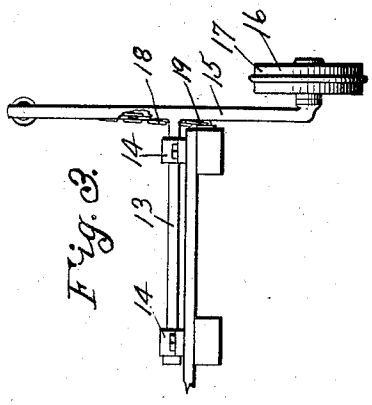


Fig. 3.



Witnesses.

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UNITED STATES PATENT OFFICE.

ALEXANDER WILLIAM McBLAIN, OF KILLDUFF, IOWA.

ROAD-GRADER.

No. 845,969. Specification of Letters Patent. Patented March 5, 1907.

Application filed June 18, 1906. Serial No. 322,633.

To all whom it may concern:

Be it known that I, ALEXANDER WILLIAM McBLAIN, a citizen of the United States, residing at Killduff, in the county of Jasper and State of Iowa, have invented a certain new and useful Road-Grader, of which the following is a specification.

My object is to provide a road-grader of simple, durable, and inexpensive construction and of few parts capable of being advanced over a road by draft-animals and of first cutting off all projections, hills, or ridges and finally of scraping the loose earth to one side; to provide a machine of this kind in which a maximum of work may be done with a minimum of applied power; to provide a grader that may be easily made to move in a straight line and that will swing laterally when in use; to provide a machine of this class in which the operator may by shifting his weight upon the top of the grader cause either side to cut more or less deeply in the road-surface.

My invention consists in the construction, arrangement, and combination of the various parts of the device whereby the objects contemplated are attained, as hereinafter more fully set forth, pointed out in my claims, and illustrated in the accompanying drawings, in which—

Figure 1 shows an inverted plan view of a complete road-grader embodying my invention. Fig. 2 shows a side elevation of same, the dotted lines indicating the position of the parts when the scraper-blades are in their elevated positions. Fig. 3 shows a detail front view of one of the supporting-wheels and connected parts, and Fig. 4 shows an enlarged transverse sectional view of one of the cutting-blades.

Referring to the accompanying drawings, I have used the reference-numeral 10 to indicate the frame which supports the platform 11. This platform extends over the entire top of the grader. At the front of the frame 10 are the auxiliary frame members 12, below the longitudinal beams of the frame. There are four independent supporting-wheels for the frame, each of which comprises a shaft 13, mounted in bearings 14 on top of the platform and having a lever 15 at its end with its lower end extended downwardly and outwardly and containing a supporting-wheel 16 with an annular rib 17 on its tread portion. A chain 18 is fixed to the top of the lever 15 and is extended downwardly and rearwardly and adjustably connected with a snap-hook 19, fixed to the frame. In the position shown in Fig. 1 the supporting-wheels are arranged so that they bear slightly upon the road-surface and the ribs enter the road-surface to prevent lateral movement of the grader. If it is desired to advance the grader with its cutting and scraping blades elevated, then the operator simply pulls downwardly and rearwardly upon each of the chains 18 and connects them with the snap-hooks 19. This would elevate the frame, and the supporting-wheels will carry it in its elevated position.

Near the forward end of the frame are three road-cutting blades arranged in parallel planes diagonal to a fore-and-aft line through the frame. The forward end of one blade is arranged in position in front of the rear end of the adjacent blade. These blades are alike and each comprises two supporting-bars 20, with upwardly-projecting screw-threaded ends 21, passed through the frame members 12 and the main frame 10. Adjusting-nuts 22 are placed on the upper ends of the parts 21 and also in the lower ends of said parts to engage, respectively, the top of the platform 10 and the bottom of the beams 12. The cutting-blades proper each comprises a substantially horizontal portion 23 with its forward top edge beveled downwardly and forwardly at 24, and the ends of each blade are projected upwardly at 25 and fixed to the supporting-bars 20. In this way each blade is supported with its cutting portion horizontal and with the sharpened edge forward and said sharpened edge extending rearwardly and laterally. In use these cutting-blades do not operate to move the ground laterally. They only cut off hills or ridges in a road and leave the loose earth standing in the same position it occupied before being cut off. In this way there is no probability of the cutters becoming clogged by the accumulation of loose earth, as would be the case if they were made to serve the double function of cutters and scrapers and by having a number of such cutting-blades arranged to extend across the entire width of the blade with the forward end overlapping the rear end of the adjacent blade. The road is cut the entire width of the frame, and yet all of the blades are short. If any blade should strike an obstruction that it could not cut, such as stones or sticks, then the blade would move such obstructions a short dis-

tance only to the rear end of the blade engaged and the other blades would not be affected, and if any one blade should become caught in an obstruction of this kind it would not affect the operation of the other blades and would accumulate only a small quantity of earth before it was discharged at the end of the blade.

After the earth is loosened by the cutting-blades I provide for moving it laterally to one side of the machine as follows: Immediately in the rear of one of the cutter-blades is a scraper comprising a vertically-arranged beam 26 with a protecting-blade 27 at its front. This scraper is supported beneath the frame by the brackets 28, and it inclines rearwardly and laterally with its front end immediately in the rear of the scraper-blade and its body portion extended rearwardly and laterally in a direction opposite from the cutter-blade. Hence this scraper engages only the earth loosened by one cutting-blade. The second scraper 29 is similar to the first, except that it is longer and its front end stands immediately in the rear of the central cutter-blade, while its body portion projects laterally and rearwardly parallel with the first scraper and its rear end extends to a point slightly beyond a fore-and-aft line through the first scraper. This second scraper obviously engages only the earth loosened by the central cutting-blade, and although it is much longer than the first one it will not require any more draft force to advance it. The third scraper 30 is arranged with its forward end immediately in the rear of the last cutting-blade and its body portion parallel with the other scrapers and its rear end projecting beyond a fore-and-aft line through the central scraper. In this way each cutter is provided with a scraper to take care of the earth loosened by it, so that a comparatively large quantity of earth may be handled without danger of clogging or overloading the scrapers.

In practical use and assuming the wheels to be in the position shown in Fig. 2 the cutting-blades and scrapers will all rest upon the earth-surface. Then as the grader is advanced by the draft-animals each of the horizontal cutting-blades will go through any hills or ridges in its path, and each scraper will convey the earth thus loosened laterally to a point outside of the grader-frame. The operator may, by shifting his weight upon the platform, cause either side of the grader to cut more or less deeply, or by shifting his weight from the front to the rear he may regulate the cutting and scraping operations so as to obtain the best results. By slightly moving the wheel-levers 15 at one side of the machine the cutters and scrapers on said side may be slightly elevated relative to those on the other side, or by elevating the rear wheels the scrapers may be raised and the cutters depressed, or by elevating the front wheels the cutters may be elevated and the scrapers depressed, so that the operator may, either by shifting his weight on the platform or by adjusting the wheels, adjust the grader to all the various conditions of the roads being worked as required to accomplish the best results.

Having thus described my invention, what I claim, and desire to secure by Letters Patent of the United States therefor, is—

1. In a road-grader, a frame, a cutter supported beneath the frame and comprising a flat blade arranged substantially horizontal and inclined obliquely relative to a fore-and-aft line through the frame and a scraper fixed to the frame in the rear of the blade.

2. In a road-grader, a frame, a cutter supported beneath the frame and comprising a flat blade arranged substantially horizontal and inclined obliquely relative to a fore-and-aft line through the frame and a scraper fixed to the frame in the rear of the blade, said scraper also inclined obliquely relative to a fore-and-aft line with its forward end in the rear of the rear end of the blade and its body portion extended obliquely in an opposite direction from the blade.

3. In a road-grader, a frame, a cutter supported beneath the frame and comprising a flat blade arranged substantially horizontal and inclined obliquely relative to a fore-and-aft line through the frame, a scraper fixed to the frame in the rear of the blade and supporting-wheels for the frame having annular ribs to prevent lateral movement.

4. In a road-grader, a frame, a cutter supported beneath the frame and comprising a flat blade arranged substantially horizontal and inclined obliquely relative to a fore-and-aft line through the frame, a scraper fixed to the frame in the rear of the blade and a number of supporting-wheels independently adjustable on the frame.

5. In a road-grader, a frame, a cutter supported beneath the frame and comprising a flat blade arranged substantially horizontal and inclined obliquely relative to a fore-and-aft line through the frame, a scraper fixed to the frame in the rear of the blade and two supporting-wheels on each side of the frame, a lever for supporting each wheel projected above the frame, a chain attached to the top of each lever and a hook attached to the frame to adjustably engage and hold each chain.

6. A road-grader, comprising a frame, a number of short cutting-blades arranged in parallel planes at the forward end of the frame and standing obliquely relative to a fore-and-aft line through the frame, the said blades being substantially horizontal, a corresponding number of scrapers supported by the frame arranged in parallel planes and extending obliquely relative to a fore-and-aft

line in an opposite direction from the blades, each scraper having a portion of its length arranged in the rear of one of the blades and all of the scrapers having their rear ends at the same side of the frame.

7. A road-grader, comprising a frame, a number of short cutting-blades arranged in parallel planes at the forward end of the frame and standing obliquely relative to a fore-and-aft line through the frame, the said blades being substantially horizontal, a corresponding number of scrapers supported by the frame arranged in parallel planes and extending obliquely relative to a fore-and-aft line in an opposite direction from the blades, each scraper having a portion of its length arranged in the rear of one of the blades, all of the scrapers having their rear ends at the same side of the frame and supporting-wheels for the frame having annular ribs to prevent lateral movement.

8. A road-grader, comprising a frame, a number of short cutting-blades arranged in parallel planes at the forward end of the frame and standing obliquely relative to a fore-and-aft line through the frame, the said blades being substantially horizontal, a corresponding number of scrapers supported by the frame arranged in parallel planes and extending obliquely relative to a fore-and-aft line in an opposite direction from the blades, each scraper having a portion of its length arranged in the rear of one of the blades, all of the scrapers having their rear ends at the same side of the frame and a number of supporting-wheels independently adjustable on the frame.

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