

No. 631,578.

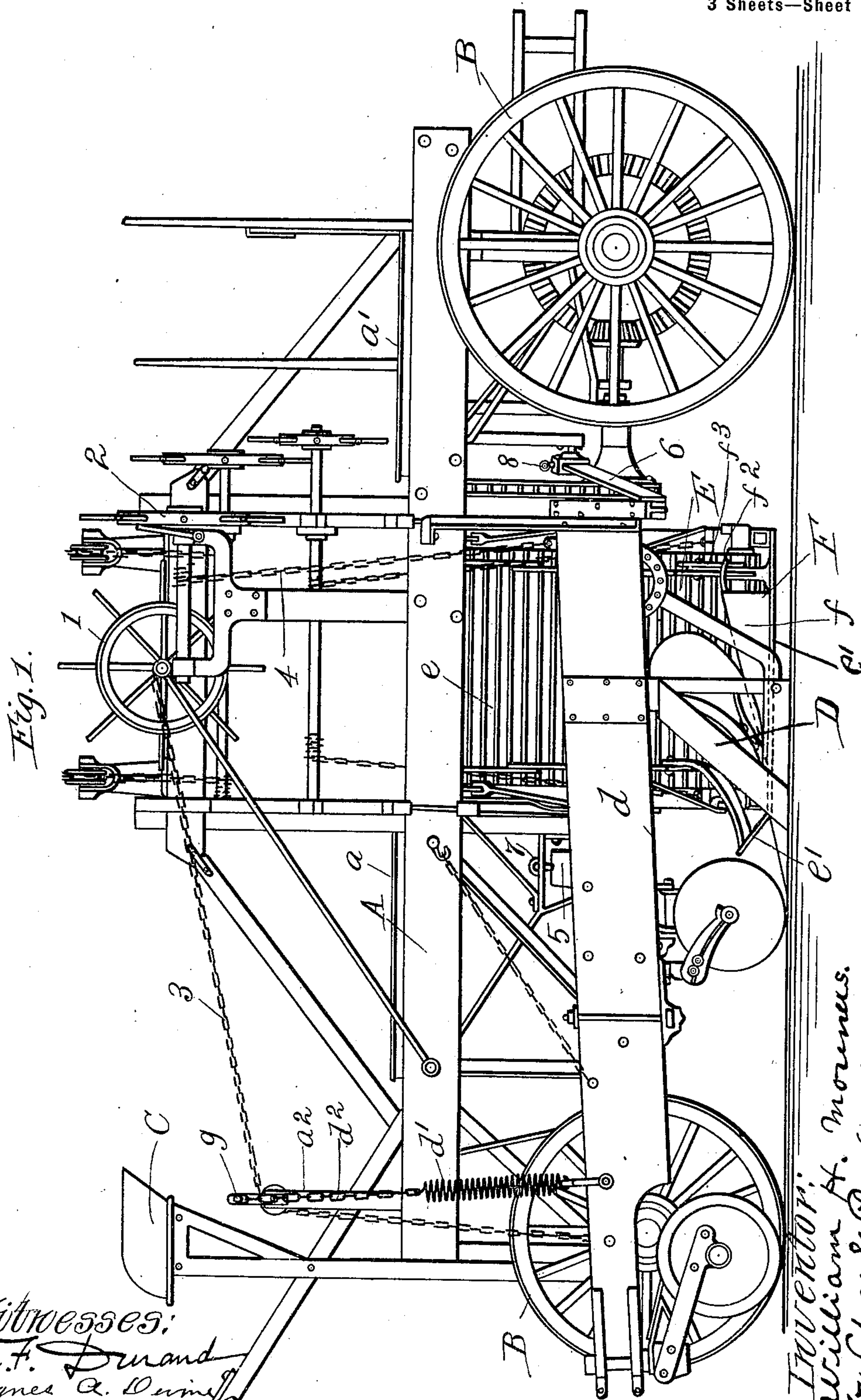
Patented Aug. 22, 1899.

W. H. MORENUS.
GRADING AND DITCHING MACHINE.

(Application filed Mar. 10, 1899.)

(No Model.)

3 Sheets—Sheet 1.



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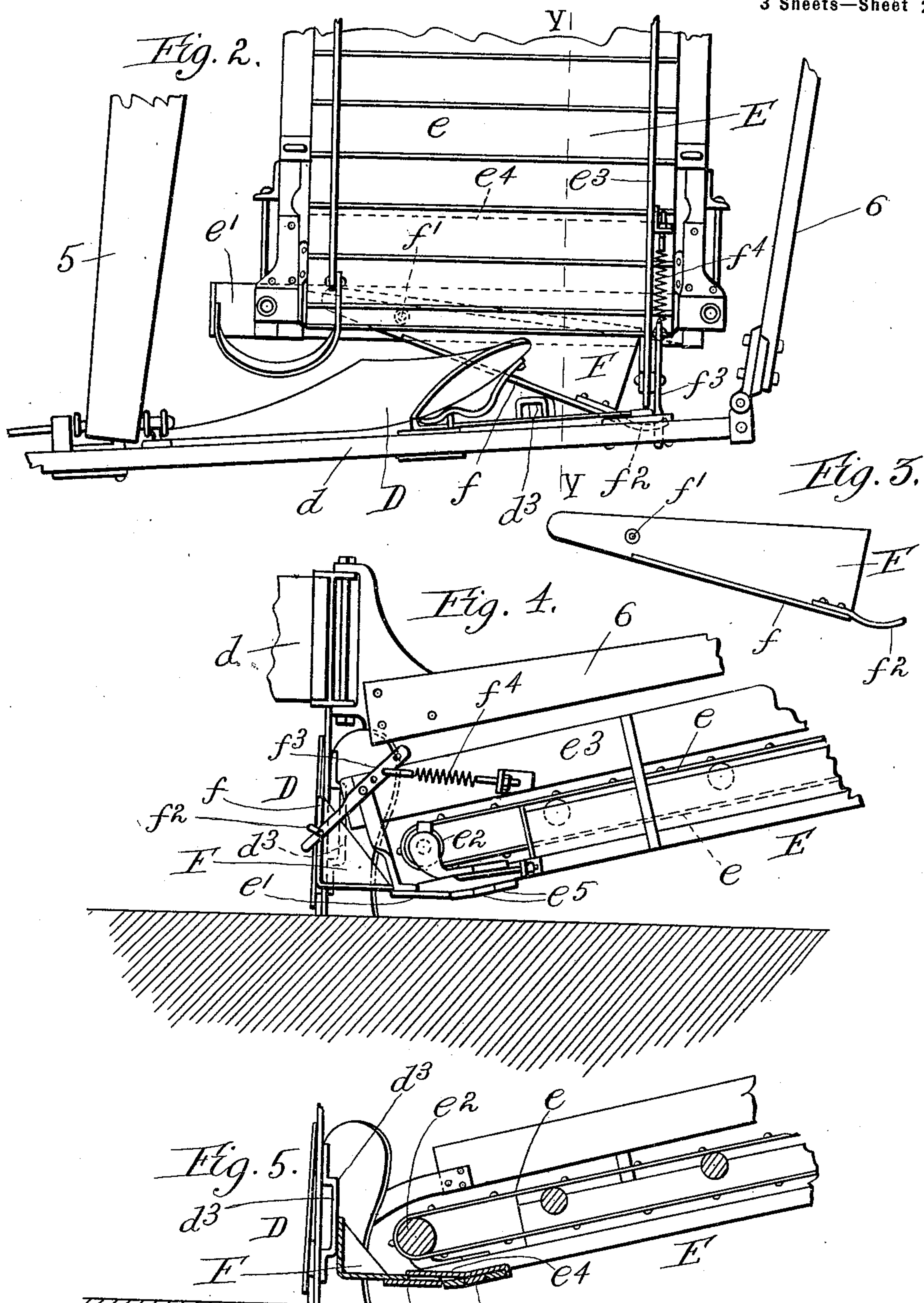
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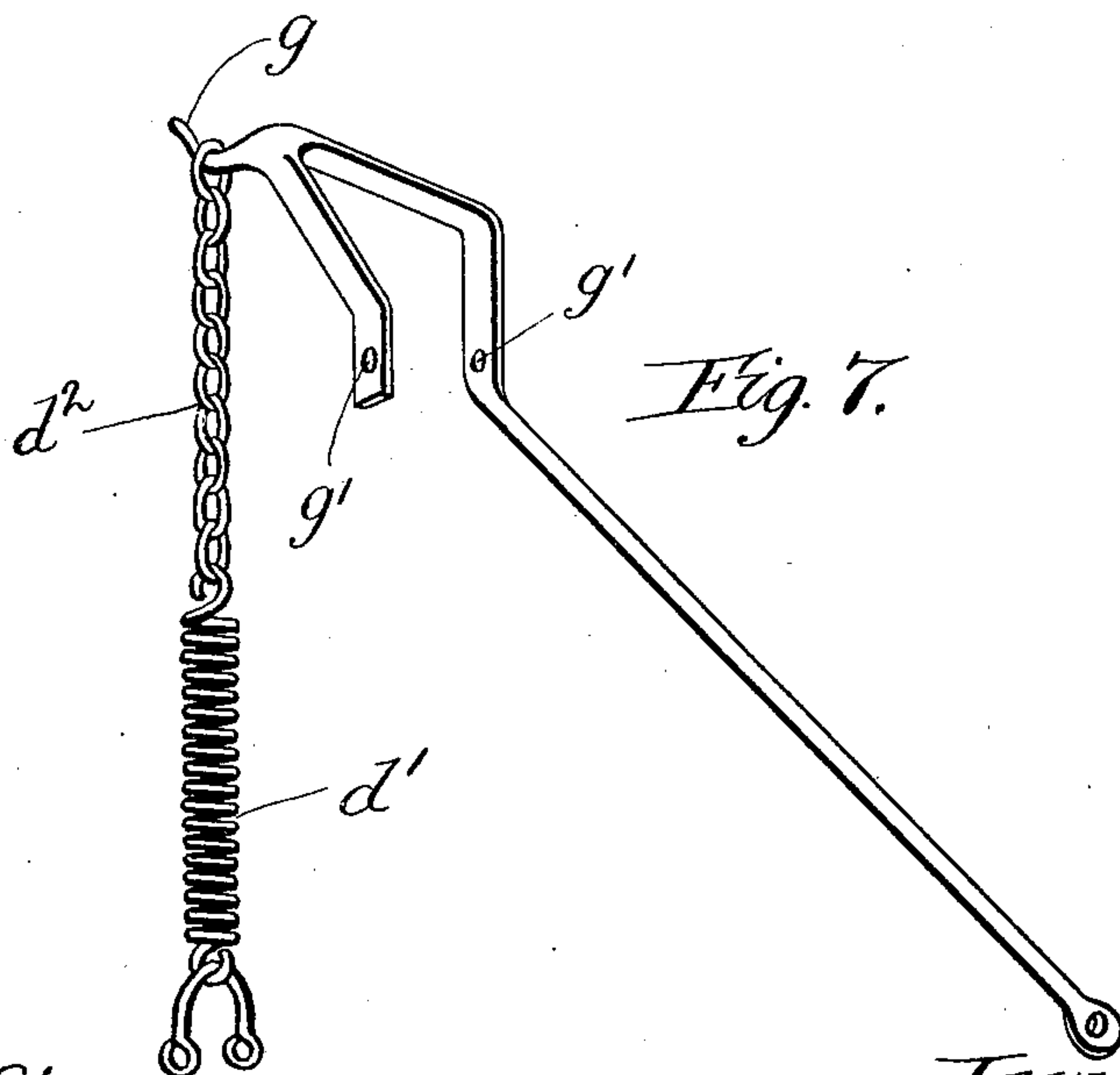
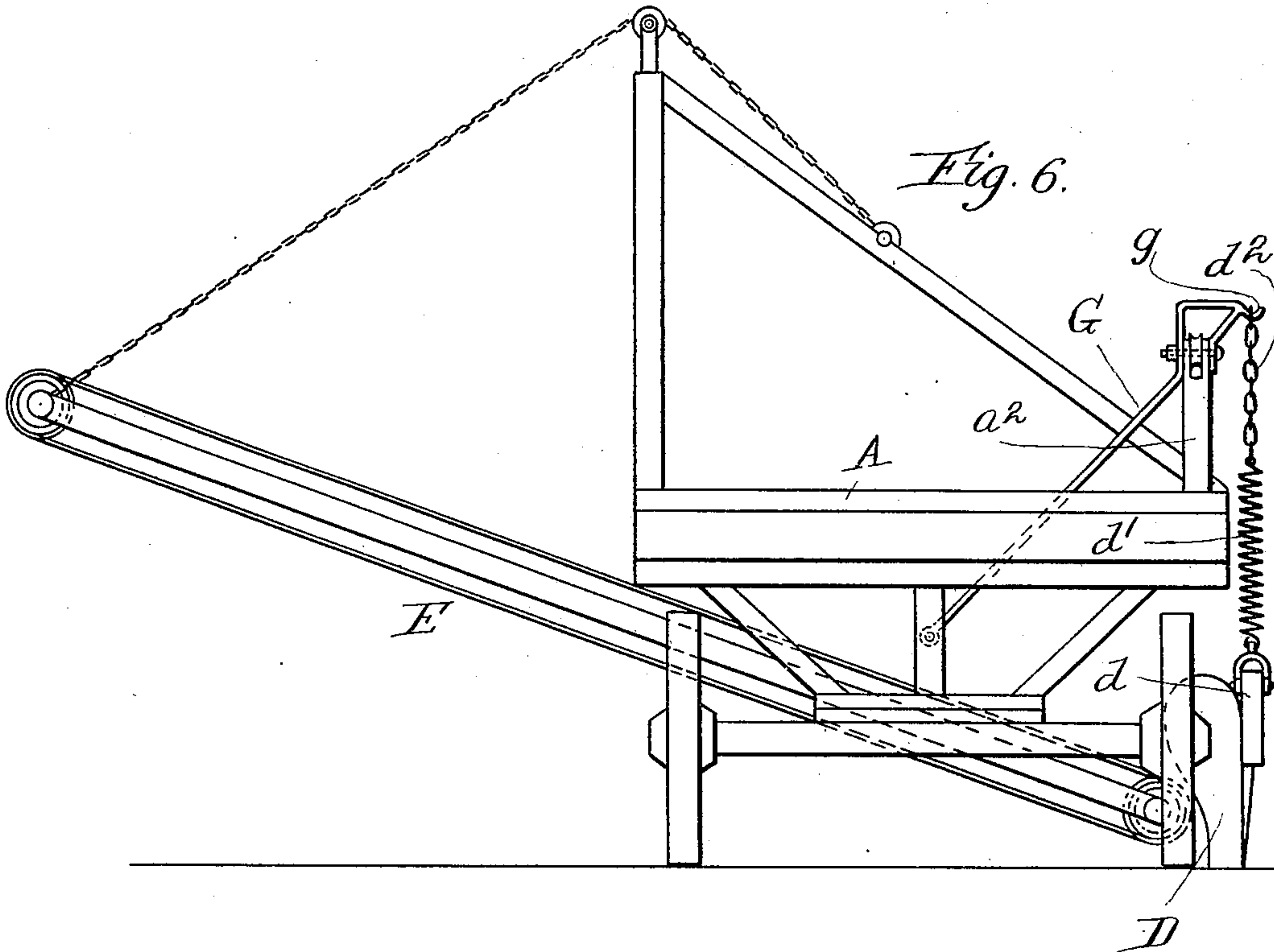
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UNITED STATES PATENT OFFICE.

WILLIAM H. MORENUS, OF LAKE VIEW, IOWA, ASSIGNOR TO FREDERICK C. AUSTIN, OF CHICAGO, ILLINOIS.

GRADING AND DITCHING MACHINE.

SPECIFICATION forming part of Letters Patent No. 631,578, dated August 22, 1899.

Application filed March 10, 1899. Serial No. 708,554. (No model.)

To all whom it may concern:

Be it known that I, WILLIAM H. MORENUS, a resident of Lake View, in the county of Sac and State of Iowa, have invented a certain new and useful Improvement in Grading and Ditching Machines, of which the following is a specification.

The construction of grading and ditching machine to which my invention is particularly applicable is shown in Letters Patent, No. 393,467, of November 27, 1898, though I may also employ my invention in connection with various other machines of this class or, in fact, any machine involving a plow arranged for a side delivery to an elevating-carrier.

One of the principal objects of my invention is to provide simple and effective means for insuring a delivery of the soil from the mold-board of the plow to the elevating-carrier, whether the machine be working in wet or dry ground, clay, muck, or sand, and the invention being particularly designed to overcome the difficulty usually experienced in operating a grading and ditching machine in dry or sandy soil.

A further object of my invention is to counterbalance the carrier without employing metal weights or the like for weighting down the body-frame, so as to counteract the tendency of the machine to tilt over to one side and to secure such a counterbalancing without modifying the usual construction or interfering in any way with the operation of the machine.

To the attainment of the foregoing and other useful ends my invention first contemplates a guard arranged below and intermedial the moldboard and carrier, whereby sand and dry dirt will, instead of being allowed to fall or sift back upon the ground, be caught and held long enough to enable the carrier to remove and convey it to the delivery side of the machine. Preferably the guard is automatically adjustable with respect to the lateral adjustment or side play of the plow or, in other words, it is capable of a self-adjustment which permits it to constantly bear against the plow, as by such arrangement the guard is enabled to perform its function regardless of the relative positions of the

plow and carrier and even though the distance between the plow and carrier may vary constantly and to some extent.

My invention further contemplates connecting the plow-beam with the body-frame in a way not to interfere with the working of the plow, but in such manner as to constantly oppose the weight of the plow and beam to the weight of the carrier. The plow-beam is usually of some length and quite heavy and when thus connected with the body-frame will serve to counterbalance the overhanging portion of the carrier, or, in other words, the weight of the plow and beam is employed for maintaining a constant downward pull on the body-frame and to thereby counteract the tendency of the machine to tilt or tip over to one side.

In the accompanying drawings, Figure 1 is a side elevation of a grading and ditching machine embodying my invention. Fig. 2 is a detail view, on a larger scale, showing the plow and the lower end portion of the carrier in plan. Fig. 3 is a detail plan view of the guard. Fig. 4 is a view showing the plow and lower end portion of the carrier in rear elevation, the view being on the same scale as Fig. 2. Fig. 5 is a vertical section on line Y Y in Fig. 2, the plow-beam not being shown and this view also being on the same scale as Fig. 2. Fig. 6 is a diagrammatic view illustrating the manner in which I oppose the weight of the plow and plow-beam to the weight of the carrier, and Fig. 7 is a perspective of the device by which I connect the plow-beam with the body-frame.

The construction of grading and ditching machine in connection with which I have illustrated my invention involves a body-frame A, supported upon vehicle-wheels B and adapted to in turn support the various mechanisms employed for adjusting the plow and carrier. A driver's seat C is arranged at the forward end of the machine, and a couple of platforms *a* and *a'* are provided for the attendants to stand upon. The plow D, which, it will be observed, is arranged for a side delivery to an elevating-carrier E, is provided with the usual plow-beam *d* and is arranged for various horizontal and vertical adjustments by means of suitable adjusting de-

vices. For instance, the plow may be raised and lowered by rotating the hand-wheels 1 and 2, the shafts of the latter being connected, respectively, with the front and rear ends of the plow-beam through the medium of chains 3 and 4, while a lateral adjustment is obtained by adjustably connecting the bars 5 and 6 with the body-frame—as, for instance, by pins 7 and 8. (See Figs. 1 and 2.)

The carrier E consists of a belt conveyer *e*, arranged to be driven from one of the rear vehicle-wheels, and is employed for conveying or transferring the soil torn up by the plow to the opposite side of the machine. A shoe *e'* is secured to the lower end of the carrier-frame, it being observed that the shoe is arranged directly beneath the lower belt-roll *e*² and that its forward end portion is turned up sufficiently to permit the lower end of the carrier to rest and slide upon the ground. (See Fig. 1.)

In operation the soil torn up by the plow is delivered from the latter's moldboard to the carrier and is then conveyed to the opposite side of the machine and there discharged either onto the ground or into a wagon traveling at that side of the machine. The moldboard of the plow is arranged slightly to overhang the carrier, and ordinarily the soil passes from the plow to the carrier without difficulty. It has been found, however, that when working in dry or sandy soil the soil has a tendency to fall or sift back upon the ground after leaving the moldboard of the plow and in such way to a certain extent render the operation of the machine ineffective. For the purpose of obviating the foregoing difficulty and enabling the machine to operate in and under all varieties and conditions of soil I provide the lower end of the carrier with a guard F, adapted and arranged to prevent the soil from falling back upon the ground. By referring to Figs. 2, 4, and 5 it will be observed that the said guard extends outwardly from beneath the lower belt-roll *e*² and that it tapers to the left in such manner as to present a broad horizontal surface directly in rear of and partly beneath the moldboard of the plow, it being understood that in this type of machine the bulk of the soil torn up by the plow is delivered to the right-hand side of the belt, and hence the broadening of the guard at its rear end. The guard preferably consists of a piece of sheet metal turned up or flanged at its outer edge, such flange *f* also preferably tapering toward the forward end of the guard and the latter, thus formed or constructed, being suitably secured to the upper surface of the carrier-shoe. The guard thus located serves to insure a delivery of the soil from the plow to the carrier, as by such arrangement dry soil or sand will, instead of falling or sifting back upon the ground, be caught and held where the cleats on the rapidly-traveling belt can get it and carry it up and away in the manner described. As a matter of further and special improvement

the guard is automatically adjustable with respect to the movements of the plow, for, as previously explained, the plow is arranged for numerous adjustments relative to the carrier and, also, there is ordinarily some little play, lateral and otherwise, on the part of the plow during its operation, and as it is desirable to maintain the guard in a position as close as possible to the plow the former is therefore preferably capable of a self-adjustment which permits it to constantly bear against the rear portion *d*³ of the plow. Various methods may be adopted for securing such automatic adjustment; but as a simple and effective arrangement I connect the guard with the shoe by means of a pivot *f'* and provide the rear end of the guard with a lug or projection *f*². A lever-arm *f*³ is pivoted to the side board *e*³ of the carrier, and a spring *f*⁴ applied to the upper end of the lever, serves to keep the latter's lower end in contact with the lug *f*², and to thereby maintain the guard in contact with the plow. A piece of sheet metal *e*⁴ is also preferably arranged to extend over the guard, the latter working between such strip of metal and the shoe *e'*, and the under side of the carrier-frame is provided with one or more cross-strips *e*⁵, as by such arrangement the dirt is prevented from crowding up and collecting under the belt and clogging avoided. Also, the strap of metal *e*⁴ serves to keep the cleats on the belt from catching on the inner edge of the guard, as in some instances the belt is permitted to run slack, and in such case the lower leaf of the belt will drag on the said metal strip without catching or interfering with the guard.

The carrier E extends across and overhangs the side of the machine, substantially as shown in Fig. 6, and at times such overhanging portion has a tendency to tilt up or raise the opposite side of the frame, for while, as stated, a couple of chains 3 and 4 are employed for raising and lowering the plow, and while the latter will tend to counterbalance the carrier when thus raised and thrown out of action, it is necessary that the chains, at least the forward one, be allowed to remain slack during the time the plow is in operation, and hence the tendency of the machine at such time to tilt or tip over to one side. For the purpose, therefore, of counteracting such tendency without resorting to an objectionable weighting down of the machine I connect the forward portion of the plow-beam *d* with the body-frame by means of a spring *d'*. The said spring is preferably a heavy coil-spring and is of a length to be under considerable tension when the plow is lowered to a working position. The plow-beam is ordinarily of some length and quite heavy, being usually constructed of iron, and will when thus connected with the body-frame maintain a constant downward pull on the plow side of the latter, thereby opposing its weight to the weight of the carrier and thus counteracting the tendency of the machine to tilt over to

one side, and it will be observed that such counterbalancing is secured without in any way interfering with the working of the plow, as the size and strength of the coil-spring is
 5 such that while sufficient to maintain a powerful downward pull on the frame it will not prevent a lowering of the plow to a working position nor tend to pull the plow out of the ground. The said spring may be secured to
 10 the beam and frame in any suitable manner, but as a matter of further improvement and with a view to permitting my invention to be used as an attachment I provide a frame-piece G, having a hook g' at its upper end.
 15 The said frame-piece is adapted at its lower end to be bolted to the body-frame and has its upper end portion so formed or shaped that it may be secured to the upper end of the usual standard a^2 . The said standard is pro-
 20 vided at its upper end with a sheave for the chain 3, and the bolt upon which the sheave revolves is passed through the holes g' in the arch-like portion of the frame-piece G, the bolt by such arrangement having a double
 25 function. The hook g is adapted to engage any one of the links in the chain d^2 , secured to the upper end of the spring, and the lower end of the latter may be secured to the plow-beam in any suitable or desired manner. The
 30 frame-piece, besides providing the body-frame with a suitable point of attachment for the spring, serves to brace the standard a^2 , and for this purpose is extended downwardly and secured to the body-frame, substantially as
 35 shown in Fig. 6. The tension of the spring is regulated by shifting the chain on the hook, or, in other words, by varying the length of that portion of the chain connecting the hook with the spring.

40 What I claim as my invention is—

1. In a grading and ditching machine, the combination of an elevating carrier or conveyer provided at its lower end with a shoe; a plow arranged for a side delivery to the
 45 lower end of said carrier, a guard secured to the shoe of the carrier and adapted and arranged to prevent the soil from falling or sifting back onto the ground, and means for driving the said carrier.

50 2. In a grading and ditching machine, an elevating carrier or conveyer, a plow arranged for a side delivery to the lower end of the said carrier, and an automatically-adjustable guard secured to the lower end of the carrier-
 55 frame and arranged to prevent the soil from falling or sifting back onto the ground.

3. In a grading and ditching machine, an elevating carrier or conveyer, a plow arranged for a side delivery to the lower end of said
 60 carrier, an automatically-adjustable guard secured to the lower portion of the carrier-frame, and one or more springs for keeping the guard in contact with the plow.

65 4. In a grading and ditching machine, the combination of a carrier having a shoe at its

lower end, a plow arranged for a side delivery to the lower end of said carrier, a guard pivoted to the upper surface of said shoe and consisting of a piece of sheet metal flanged or turned up at its outer edge, and one or
 70 more springs for keeping said outer portion of the guard in contact with the plow.

5. In a grading and ditching machine, the combination of a suitable body-frame mounted upon vehicle-wheels; a plow adapted for
 75 tearing up the soil and arranged longitudinally at one side of said body-frame; a transversely-arranged elevating carrier or conveyer extending from the plow to and overhanging the opposite side of the machine; 80
 and means for elastically connecting the plow-beam with the said body-frame whereby the former will maintain a constant downward pull on the latter for the purpose of counterbalancing the said elevating-carrier and there- 85
 by preventing the latter from tilting up the plow side of the machine during the operation of plowing up the ground.

6. In a grading and ditching machine, the combination of a suitable body-frame mount- 90
 ed upon vehicle-wheels; a plow arranged for a side delivery to a transversely-extending carrier or conveyer; and a spring connection between the plow-beam and body-frame, whereby the weight of the plow and beam 95
 will tend to counterbalance the overhanging portion of the said carrier or conveyer.

7. In a grading and ditching machine, the combination of the body-frame, the plow ar- 100
 ranged at one side of said frame, the elevating carrier or conveyer extending from the plow to and overhanging the opposite side of the machine, and the coil-spring arranged to connect the forward portion of the plow- 105
 beams with the body-frame, whereby the weight of the plow and beam will tend to counterbalance the overhanging portion of the said carrier or conveyer.

8. In a grading and ditching machine, and in combination with the body-frame, plow and 110
 carrier, the chain suspended from a hook on the forward portion of the body-frame, and a coil-spring suspended from the end of said chain and having its lower end connected with the forward portion of the plow-beam, 115
 substantially as and for the purpose described.

9. A grading and ditching machine comprising in combination an elevating-carrier; a plow arranged for a side delivery to the 120
 lower end of said carrier; a sand-guard secured to the lower end of said carrier and arranged to project outwardly from beneath the lower belt-roll, and adapted and arranged to prevent the soil from falling or sifting back upon the ground; and means for operating 125
 said elevating-carrier.

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