

(No Model.)

2 Sheets—Sheet 1.

P. BROLIN.
DITCHING MACHINE.

No. 333,441.

Patented Dec. 29, 1885.

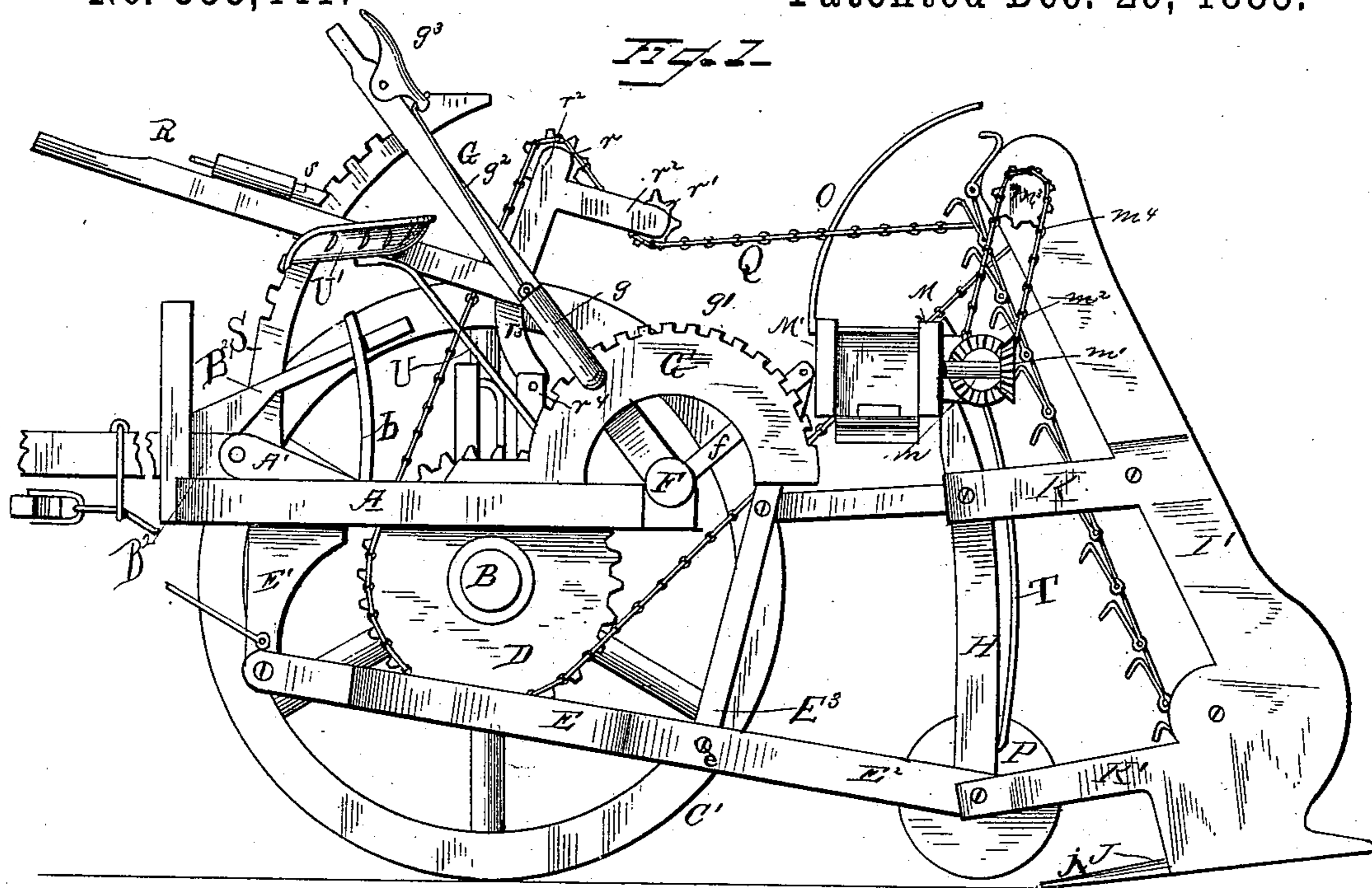
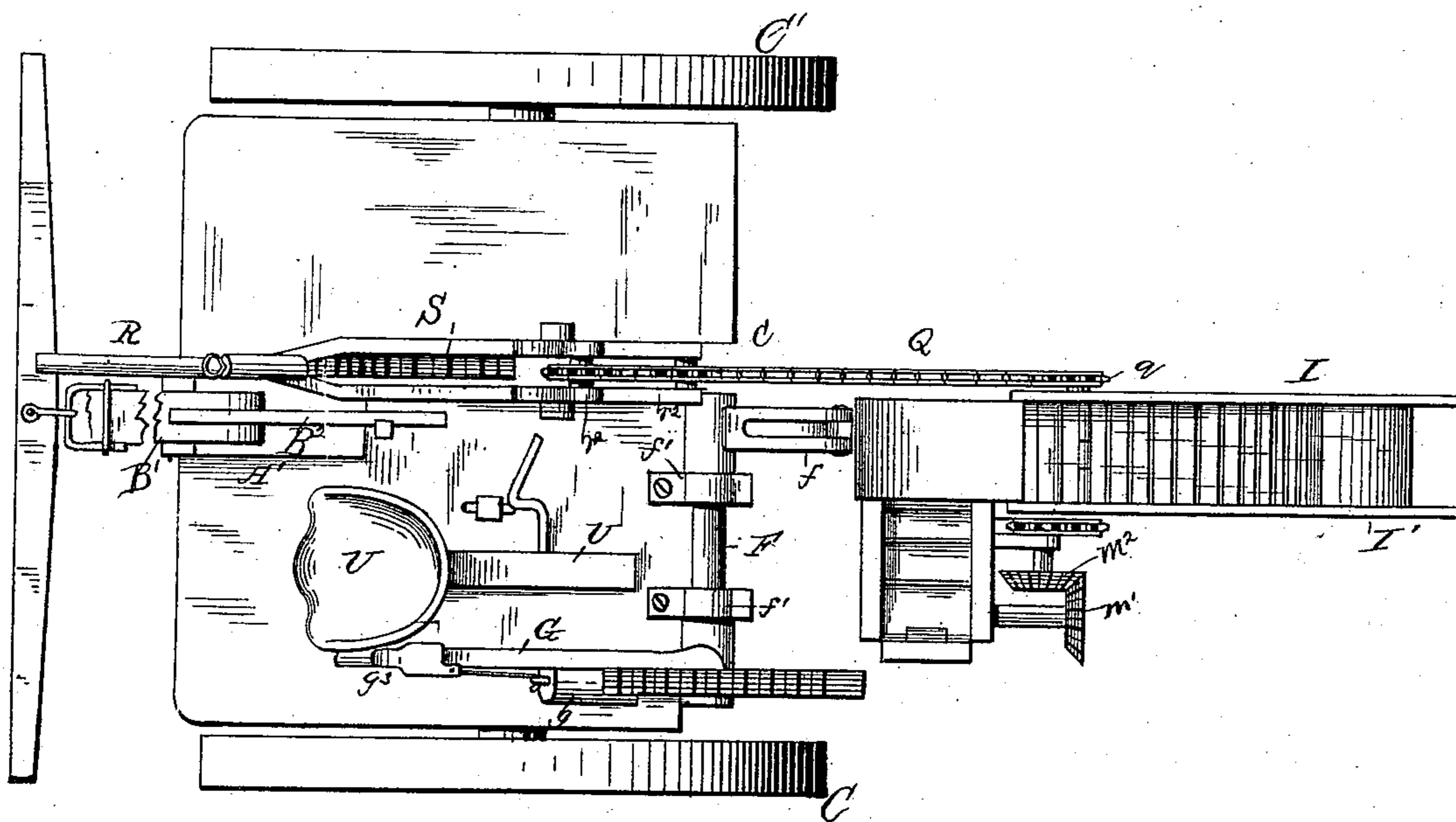


FIG. 1



WITNESSES
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(No Model.)

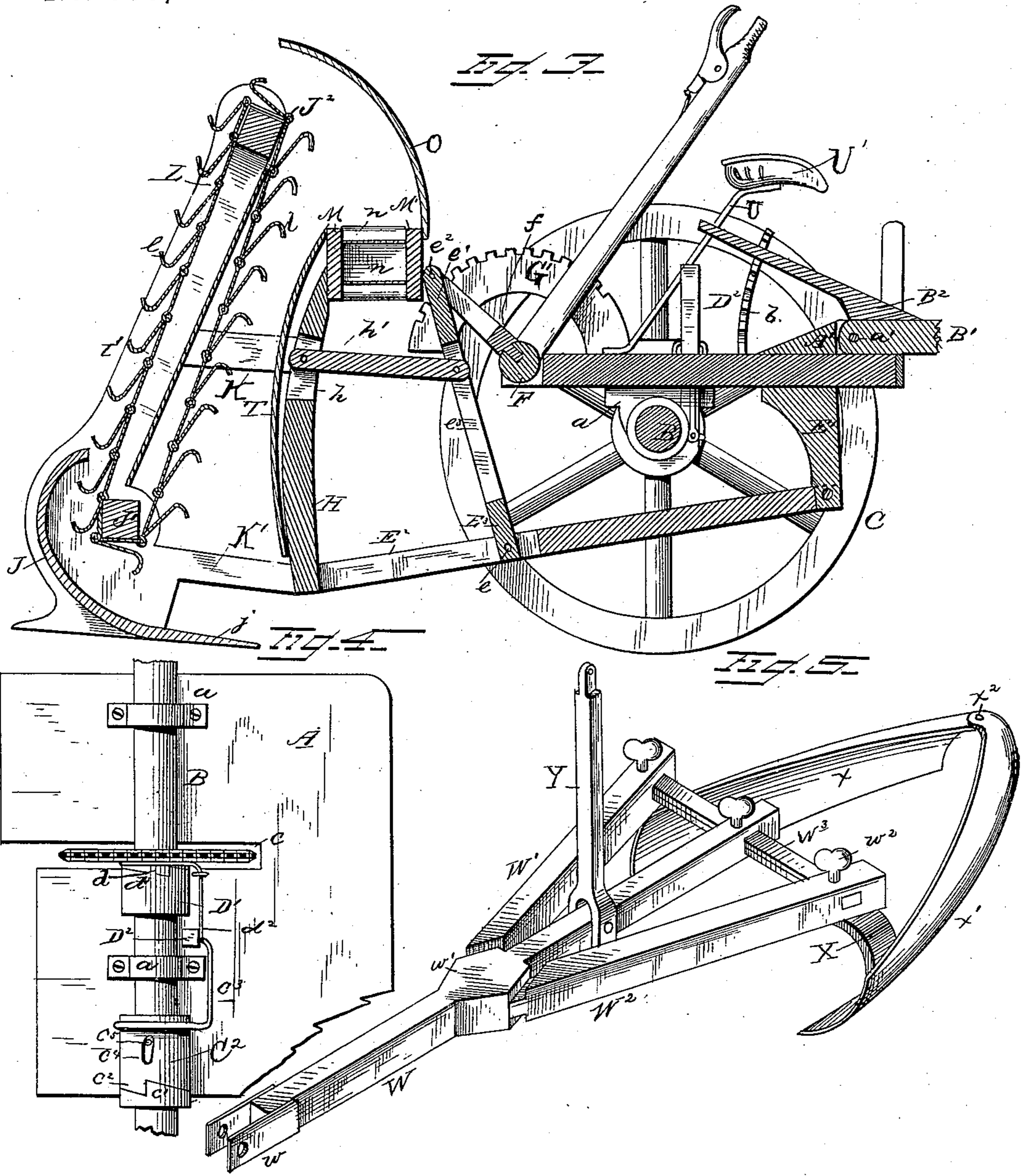
2 Sheets—Sheet 2.

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WITNESSES

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UNITED STATES PATENT OFFICE.

PETER BROLIN, OF WEST UNITY, OHIO, ASSIGNOR OF ONE-HALF TO MILTON C. SHELTER, OF SAME PLACE.

DITCHING-MACHINE.

SPECIFICATION forming part of Letters Patent No. 333,441, dated December 29, 1885.

Application filed April 17, 1884. Serial No. 128,262. (No model.)

To all whom it may concern:

Be it known that I, PETER BROLIN, a citizen of the United States of America, residing at West Unity, in the county of Williams and State of Ohio, have invented certain new and useful Improvements in Ditching-Machines; and I do hereby declare the following to be a full, clear, and exact description of the invention, such as will enable others skilled in the art to which it appertains to make and use the same, reference being had to the accompanying drawings, and to letters or figures of reference marked thereon, which form a part of this specification.

My invention relates to ditching-machines; and it consists in the improvements and combination of parts hereinafter fully described and set forth.

In the accompanying drawings, forming part of this specification, Figure 1 is a side elevation of a ditching-machine, with one wheel removed, embodying my improvements. Fig. 2 is a plan view of Fig. 1. Fig. 3 is a central longitudinal section of Fig. 1, the position of the machine being reversed, and Figs. 4 and 5 are detail views.

The supporting carriage or frame consists of a platform, A, provided centrally on its under side with a series of pending hangers, *a*, to receive the axle B, which turns therein and has keyed on its ends the supporting-wheels C C'. A bracket, A', secured centrally at the front of the platform, has pivotally connected thereto by a pivotal bolt, *a'*, the rear end of the draft-tongue B'. An inclined arm, B², is secured to the upper side of the said draft-tongue B', and extending rearwardly is adapted to engage a vertical curved rack, *b*, mounted on the platform. The platform A is provided with an elongated slot, *c*, through which projects above the upper side of the platform a sprocket-wheel, D, turning on the axle B. The said sprocket-wheel D is provided with cam-shoulders *d*, adapted to engage corresponding cam-faces, *d'*, on a sleeve, D', rigidly secured to the axle B. (See Fig. 4.) A post, D², is secured centrally in the platform A and projects both from the upper and under side thereof, and to its lower projecting portion is secured one end of a spring, *d*², the other end

of which spring embraces and is secured to the cam-shoulders *d* of the sprocket-wheel D, this arrangement acting to normally maintain the said cam-shoulders in an engagement with the corresponding cam-faces of the sleeves D'. The wheel C' is rigidly keyed on the end of the shaft B, while the wheel C turns loosely on the other end of said shaft, and is provided with cam-shoulders *c'*. A sleeve, C², is mounted on the shaft B adjacent to the cam-shoulders *c'*, and is provided with cam edges *c*², adapted to engage said cam-shoulders *c'*. One end of a spring, C³, is secured to the lower projecting portion of the post D², while its other end is looped to embrace the inner end of the sleeve C², so as to maintain the cam-faces *c*² of the same normally in intimate contact with the cam-shoulder *c'* of the supporting-wheel C'. A slot, *c*⁴, is formed in the sleeve C² to receive a pin, *c*⁵, projecting from the axle B, this arrangement permitting a limited longitudinal movement of the sleeve C² upon the axle B, but insuring the rotation of said axle therewith. A central longitudinal beam, E, is pivotally secured at its front end to an arm, E', depending from the under front side of the platform A, the rear portion, E², of said beam being bifurcated to receive the lower end of a vertical bar, E³, which is pivotally secured at its lower end in the bifurcated portion E² of the beam E by a bolt, *e*, the upper end of said arm being formed to present a tongue, *e'*, which is pivotally secured by a bolt, *e*², between bifurcations of a yoke-arm, *f*, rigidly secured to and projecting from the rear side of a rock-shaft, F, journaled in bearing *f'* therefor, located at one side of the platform A, at the rear end thereof. An operating-lever, G, is secured to one end of the shaft F, so as to lock the same in its bearings, and is provided with a spring-pawl, *g*, adapted to engage recesses formed by teeth *g'* on a segmental plate, G', secured on the platform. The said spring-pawl *g* is connected by a rod, *g*², with one end of a plate, *g*³, pivoted at the upper end, so as to permit said lever G and plate *g*³ to be manipulated with one hand. A standard, H, composing the front section of the excavator, is pivotally secured at its lower end in the bifurcated portion E² of the beam E at the rear end thereof.

The upper portion of said standard H is provided with a vertical slot, h , in which slot is pivoted one end of a connecting-bar, h' , the other end of which is pivotally secured in an elongated slot, e^3 , formed in the lever E^3 . Vertical sections $I I'$ are elongated at their lower ends, as shown in Figs. 1 and 3, and are connected together by means of a curved shoe, J, extending at its front portion to form a blade, j , and by transverse shafts $J' J^2$, turning in bearings in said side sections, $I I'$, respectively, at the upper and lower portions of said sections. Horizontal arms $K K'$ extend forwardly from each section $I I'$, and are pivotally connected at their front ends to the sides of the standard H. A conveyer, belt, or carrier, L, passes around the shafts $J' J^2$ between the sections $I I'$, and is formed so as to present a series of buckets, l . A horizontal bar, M, transverse to the length of the machine, is secured at one end to the upper end of the standard H, and has connected to it by a central bar (not shown) a second parallel bar, M' , the two bars $M M'$, having journaled near each end suitable shafts, m , around which passes a short endless carrier or conveyer, N, composed of a series of buckets, n . One of said shafts m projects rearwardly, and has keyed on its extremity a bevel gear-wheel, m' , meshing with a second beveled gear-wheel, m^2 , keyed on the end of a shaft parallel with the bar M, and turning in bearings in the rear face of said bar. One end of the shaft J^2 projects sufficiently from the side of the section I' to permit a sprocket-wheel, m^3 , to be keyed thereon, which sprocket-wheel drives the shaft journaled on the rear face of the bar M by means of a drive-chain, m^4 . A curved fender, O, is secured at its lower end to the front side of the bar M' , as shown in Figs. 1 and 3. Rolling cutters P are journaled at the lower end of the standard H and on each side of the same, and serve to cut the ground in advance of the shoe J. The upper shaft, J^2 , projects from the side of the section I to rigidly receive a sprocket-wheel, q , around which passes an endless chain, Q, also passing around the sprocket-wheel, D, and around smaller sprocket-wheels, $r r'$, journaled in angular extensions r^2 of a pivoted lever, R, having an extension, r^3 , by which it is pivotally secured to standards r^4 , located on the upper side of the platform. A curved rack-arm, S, is adapted to engage a spring-pawl, s , located on the lever R, and designed to lock said lever in any of the several positions to which it may be moved. Devices similar to those located on the lever G may be provided for the lever R to operate the spring-pawl s of the same. A spring-plate, T, of any preferred construction is secured at its upper end to the plate M, and depends so as to cover the slot h of the standard H, and to afford a yielding contact for the buckets L should they strike the same. An inclined beam, U, is secured on the upper side of the platform A, and carries on its upper end a suitable seat, U' .

The operation of the device is as follows: By moving the lever G forward, so as to effect a partial rotation of the shaft F, the arm f will lift the connecting-bar E^3 , thus elevating the beam E, and also the excavator, the connecting-bars h' moving the upper portions of the excavating devices forward. By a reverse movement of the said lever G the lower portions of the excavating devices are thrown in contact with the ground, so that the bladed portion j of the shoe J will scoop up earth or sod. The sprocket-wheel D, which is rotated from the shaft B, drives the various other sprocket-wheels by means of the drive-chain Q when the lever R is thrown upward and backward. When said lever is thrown downward and forward, the tension of the drive-chain is so slackened as to cause said chain to be thrown off of wheel D, and thus place the chain in inoperative condition. As the earth or sod is scooped up by the bladed portion j of the shoe J, it passes up rearward to the curved portion of said shoe J, from whence it is conveyed by the endless carrier L up over the shaft J'' , and dumped onto the transverse carrier N, which discharges it from one side of the machine. The fender O prevents the dirt from being scattered and inconveniencing the operator. By means of the cam-shoulder and sleeve arrangements of the axle B and sprocket-wheel D a rearward rotation of the said axle B, as in the case of backing or turning, will cause the sleeve D' to force the said sprocket-wheel D to one side of the slot c in the platform A without rotating the same, the cam-shoulders c' on the wheel C likewise longitudinally shifting the sleeve C^2 on the axle B without causing it to rotate said axle. The springs $d^2 C^3$ effect the restoration of the parts to their normal position to effect a proper relative actuation of the same upon the forward movement of the carriage and consequent operation of the endless carrier. The height of the draft-tongue B' with respect to the platform A may be easily regulated by causing the extension of said draft-tongue to engage any of the teeth of the curved rack b .

In Fig. 5 I have illustrated a device designed to be substituted for the beam E and the excavating devices. The said device consists of a beam, W, provided with plates w at its front end, perforated for attachment to the depending arm E' . The central portion, w' , of the beam is enlarged to provide for the pivotal attachment of two side sections, $W' W^2$, the free ends of which and the rear end of the beam W being perforated for the passage of a transverse bar, W^3 . The said sections $W' W^2$ may be adjusted with respect to the central beam, W, by moving them upon the transverse bar W^3 , and locking them in any desired position by means of clamp-bolts w^2 . Curved standards X depend from the under side of the rear portion of the side sections, $W' W^2$, and have secured thereto the front portions of curved guards or wings $x x'$, pivotally secured together at their rear ends

by pivot-bolts x^2 . An arm, Y, is connected to the rear portion of the beam W and to the arm f, so as to permit the device to be elevated by means of the rack-shaft F and lever G.

5 From the foregoing description it will be apparent that the guards or shields $x x'$ may be adjusted to or from each other, so as to adjust the area in which they travel and from which they move the loose earth into the
10 ditch.

I claim—

1. The combination, in a ditching-machine, of a supporting-carriage mounted on a main axle, excavating devices driven from said main
15 axle by means of a drive-chain, sprocket-wheels $r r'$, journaled as described, and means for moving said sprocket-wheels relative to the drive-chain, as and for the purpose specified.

20 2. The combination, in a ditching-machine, of a supporting-carriage mounted on a main axle, excavating devices driven from said main axle by means of a drive-chain, sprocket-wheels $r r'$, journaled as described, hand appliances for moving said sprocket-wheels relative to the drive-chain, and means for vertically moving the excavating devices, substantially as specified.

3. The combination, in a ditching-machine,
30 of a supporting-carriage mounted on a main axle, a pivoted beam supporting a vertical endless conveyer, and a horizontal conveyer provided with an endless belt, both of said conveyers being driven from said main axle
35 by means of a drive-chain, sprocket-wheels $r r'$, journaled as described, hand appliances for moving said sprocket-wheels relative to said drive-chain, and means for vertically moving said conveyers, substantially as set forth.

40 4. The combination, in a ditching-machine, of a supporting-carriage mounted upon a supporting axle or shaft, a beam pivoted to said carriage and supporting a vertical conveyer, and a horizontal conveyer arranged transversely to said vertical conveyer, a drive-chain for operating said conveyers from the main axle or shaft, and a pivoted lever provided with sprocket-wheels engaging with said drive-chain to take up the slack therein, substantially as and for the purpose specified.
50

5. The combination, in a ditching-machine, arranged and operating substantially as described, of a vertical conveyer and a horizontal conveyer pivotally supported, the operator's seat located approximately in a line with the plane of the horizontal conveyer, and a curved fender, O, interposed between the horizontal conveyer and the operator's seat, as
60 specified.

6. The combination, in a ditching-machine arranged and operating substantially as set forth, of a carrying-wheel turning loosely on the end of a main axle or shaft and provided with cam-shoulders c' , adapted to engage corresponding faces on the sleeve C^2 , rotating with said main axle or shaft and sliding longitudinally thereon, a spring, C^3 , formed and secured, as described, for maintaining said cam-shoulders and faces in engagement with each other, actuating devices, a chain driven therefrom to operate the excavating mechanism, sprocket-wheels $r r'$, and hand appliances for moving said wheels relative to the chain, as specified. 65

7. The combination, in a ditching-machine,
75 of a supporting-carriage mounted on a main axle, excavating devices driven from said main axle by means of a drive-chain, Q, and provided at their lower portion with a shoe, J, terminating at its front in a bladed portion, j, means for automatically effecting a cessation of the operation of the said excavating devices upon a rearward rotation of said axle, sprocket-wheels $r r'$, journaled as described, and hand appliances for moving said sprocket-wheels relative to said chain, substantially as set forth. 80

8. The combination, in a ditching-machine arranged and operating substantially as described, of an endless conveyer, L, supported on shafts $J' J^2$, journaled in side sections, $I I'$, having the horizontal extensions $K K'$, connected with the vertical standard H, and means for vertically adjusting said conveyer, substantially as and for the purpose set forth. 85

9. The combination, in a ditching-machine arranged and operating substantially as described, of the vertical conveyer L, supported and actuated as herein set forth, vertical standard H, and spring-plate T, arranged in proximity thereto, for the purpose specified. 90

10. The combination, in a ditching-machine arranged and operating substantially as described, of a beam, W, enlarged at its center for the pivotal attachment of the sections $W' W^2$, the beam W and sections $W' W^2$ being slotted for the passage of a transverse bar, W^3 , clamp-bolts w^2 , for securing said beam and sections upon said bar, and standards depending from the rear ends of said sections and having attached thereto curved side wings or guards, $x x'$, pivotally connected together at their rear ends, substantially as set forth. 105

In testimony whereof I affix my signature in presence of two witnesses. 110

PETER BROLIN.

Witnesses:

ALBERT M. WILBER,
MARION BEATY.