

Feb. 14, 1933.

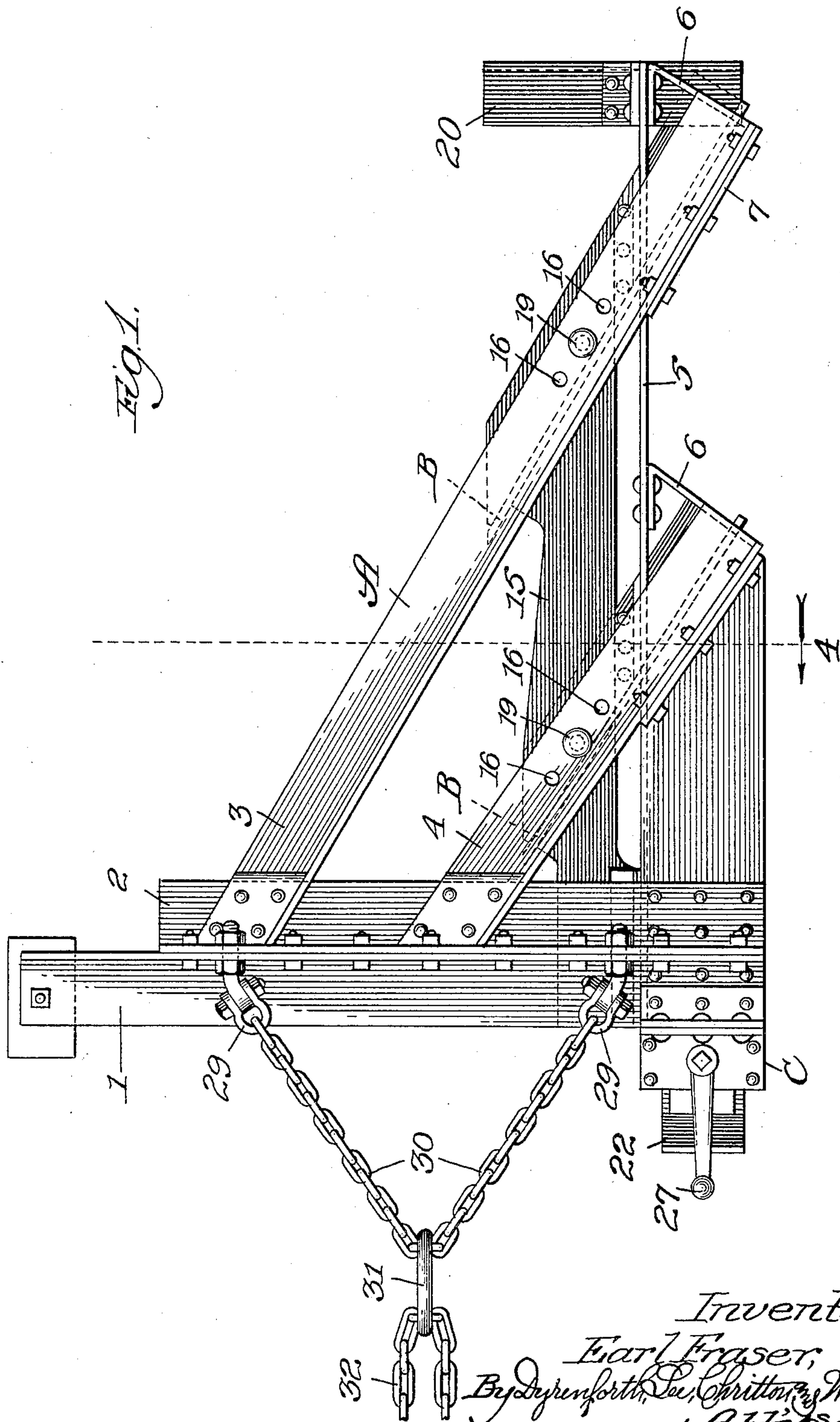
E. FRASER

1,897,695

PLOW

Filed Nov. 9, 1931

3 Sheets-Sheet 1



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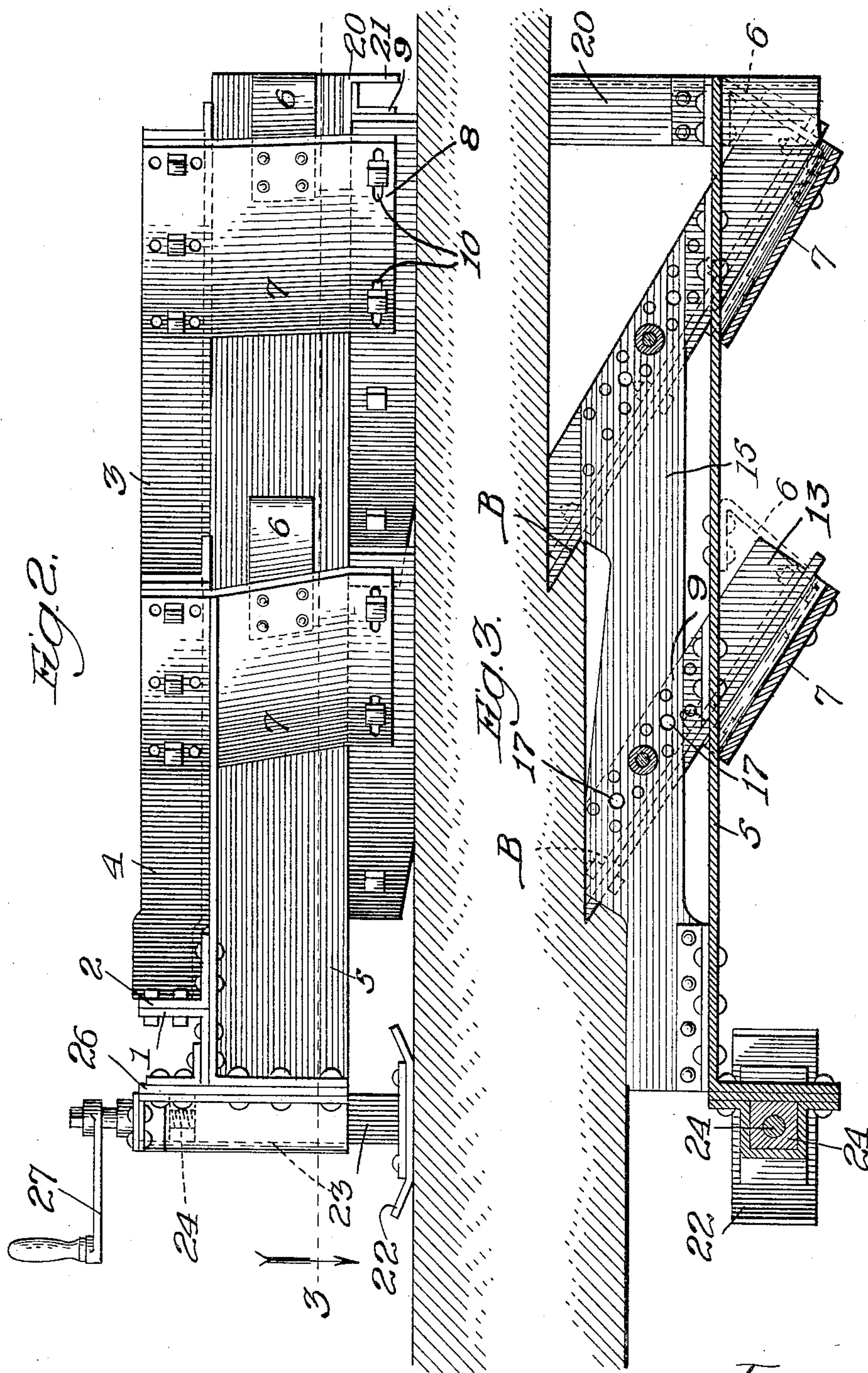
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3 Sheets-Sheet 2



Inventor:
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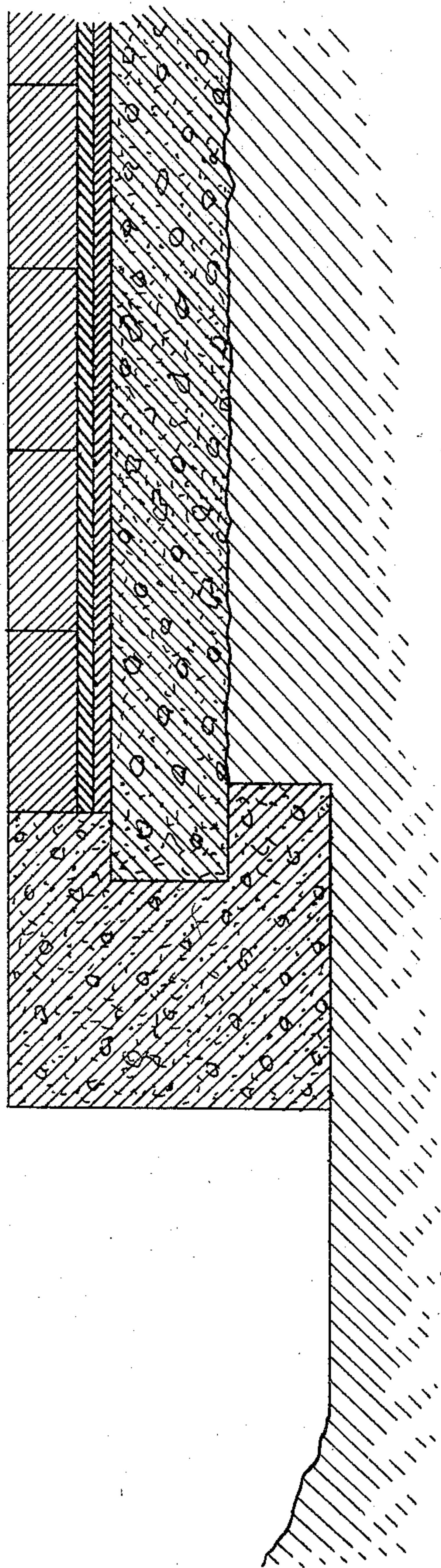
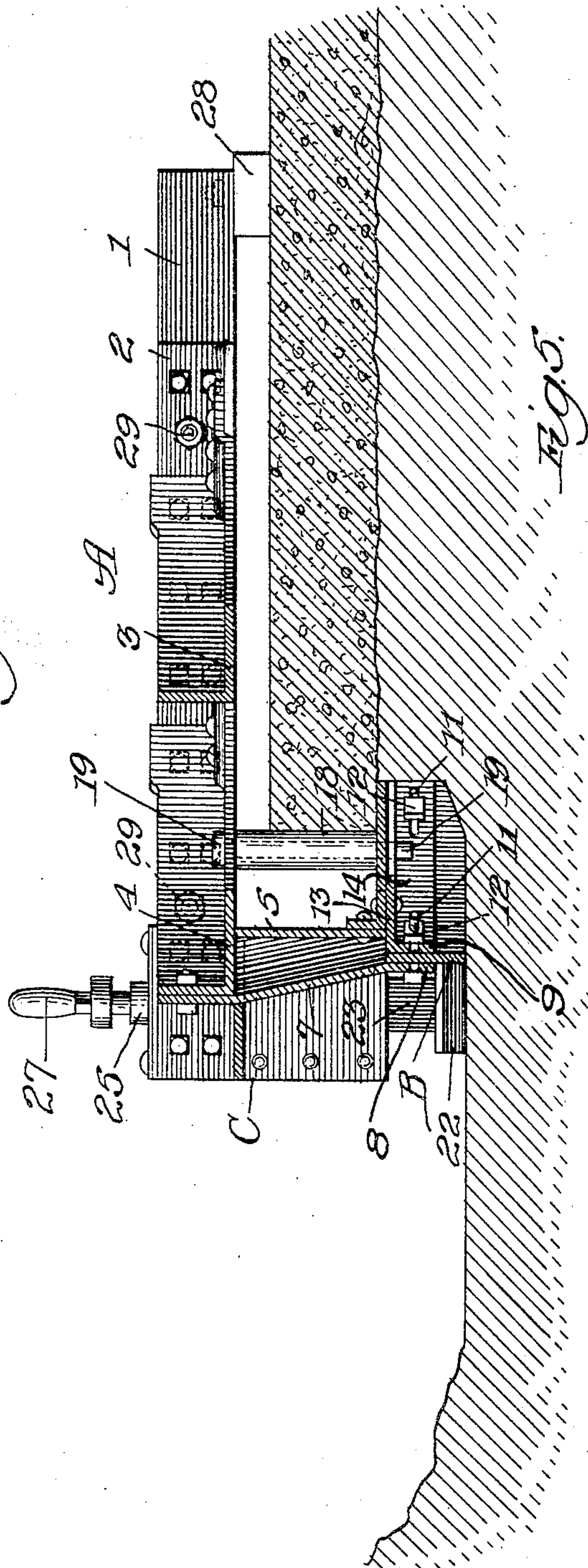
FIG. 4.

FLOW

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3 Sheets-Sheet 3



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UNITED STATES PATENT OFFICE

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PLOW

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This invention relates to an under-cutting plow and more particularly to a plow adapted to under-cut bodies such as concrete pavements and the like.

5 In repairing concrete or similar paving, it is customary to remove the earth below the edge of the pavement and to form a shoulder abutting and under-lying the edge of the old pavement, as will be described more fully hereinafter.

10 A primary object of the present invention is to provide a plow, which will under-cut the concrete pavement or slab to an accurate depth or cross-section, and which will clean off the earth adhering to the under-side of the under-cut portion of the paving slab.

15 A further object is to provide an under-cutting plow of sturdy and staunch construction which may be adjusted to under-cut a paving slab to a predetermined depth and width.

Other objects and advantages will appear as the specification proceeds.

25 The invention is described in its preferred embodiment in the accompanying drawings, in which—

30 Figure 1 is a plan view of plow apparatus embodying my invention; Fig. 2, a side view in elevation; Fig. 3, a plan sectional view, the section being taken as indicated at line 3 of Fig. 2; Fig. 4, a sectional view, the section being taken as indicated at line 4 of Fig. 1; and Fig. 5, a sectional view of a concrete roadway equipped with a shoulder which extends under the edge of the pavement.

35 In the illustration given, A represents plow frame apparatus, B, plow blades or cutters supported at spaced distances from the top of the frame A, and C, adjustable shoe mechanism for supporting the outer edge of the frame A.

40 The frame A preferably comprises a top frame adapted to overlie and to be supported in sliding relation on a concrete pavement, and frame members for supporting the plow

blades B at a spaced distance below the top frame. In the illustration given, frame A is provided at its forward end with a draw plate 1, which is in the form of an angle-iron having a horizontal and a vertical flange. 50 A similar plate 2 has its vertical flange bolted to the vertical flange of the draw plate 1 so that its horizontal flange extends rearwardly. The draw plate 1 is secured on its outer edge to the adjustable shoe mechanism C by suitable flange and rivet connections. 55 Secured to the horizontal flange and plate 2 are two obliquely disposed frame plates 3 and 4.

60 The frame A also comprises a longitudinal beam 5 which extends substantially the length of the plow and which is adapted to flank the edge of the concrete slab. Beam 5 is connected at its forward end by suitable flange and bolt connections to the adjustable shoe mechanism C. It is also connected to the oblique frame plates 3 and 4 by means of metal straps 6, which connect beam 5 to the cutter supporting plates 7. The plates 7 are 65 bolted to the vertical flanges of the angle-iron frame plates 3 and 4. As shown more clearly in Figs. 2, 3 and 4, each cutter supporting plate 7 is obliquely disposed with respect to beam 5, and is provided at its lower end with a straight flange 8 adapted to abut 75 the cutter blade B. The cutter blade B is buttressed on the opposite side by an angle-iron support 9, which extends below the beam 5. The flange section 8 and the supporting plate 9 are provided with adjustment slots 80 10 and 11 respectively, through which bolts 12 extend. The bolts engage perforations in the blade B and permit longitudinal adjustment of each of the blades.

85 As more clearly shown in Fig. 4, the supporting plate 9 is illustrated in the form of an angle-iron having a horizontal flange 13 abutting the lower edge of beam 5, and a vertical depending flange 14 abutting blade B. 90

In the illustration given, two cutters B are shown, although any desired number may be employed. To secure the cutters together and to the vertical beam 5, I prefer to employ
 5 a wide metal strap 15 having the shape illustrated more clearly in Fig. 3. The strap is preferably bolted near its forward end to the beam 5 and is secured to the top flanges 13 of the blade supporting plates 9. This
 10 form of strap, not only reinforces the outer edges of the cutters but also, by reason of its shape and location, permits the dirt to work out and avoids jamming the plow with earth. The plow blades B are preferably set so as
 15 to take bites of varying widths. As illustrated, the rear blade projects a little farther under the concrete slab than the forward blade.

In order to regulate the width of the bite, I
 20 prefer to employ the following mechanism. As illustrated more clearly in Figs. 1, 3 and 4, frame plates 3 and 4 are provided with a series of adjustment openings 16. A corresponding series of adjustment openings 17
 25 are provided in the horizontal flanges 13 of the blade supporting members 9, which extend below the frame members 3 and 4. Rollers 18 encircle a bolt 19 which extend through an alined pair of openings 16 and 17.
 30 The rollers 18 engage the sides of the concrete slab and serve as guides to regulate the depth or width of the bite of the plow blades.

The plow is preferably equipped at its
 35 rear with a deflector or clean-up member 20 which serves to remove any of the earth which may remain behind the plow blades. The member 20, in the illustration given, is provided with a depending vertical flange 21
 40 which serves to sweep the loose earth to the outer side of the plow.

The adjustable shoe mechanism C preferably comprises a shoe member 22 adapted to slide upon the bottom of the trench. The
 45 member 22 is preferably formed integrally with a block 23, which is interiorly threaded to engage a screw 24. The screw 24 is supported within a collar 25, which is secured to the casing member 26. A handle 27 is
 50 provided for turning the screw member 24. If desired, similar adjustable shoes may be provided to support the rear end portion of the plow and also the front inner end of the plow.

As shown more clearly in Figs. 1 and 4, the inner end of the draw plate 1 is provided with a fixed shoe 28. By means of shoe 28 and adjustable shoe mechanism C, the draw
 60 plate 1 may be supported at a fixed distance above the pavement. Adjustment of the plow to pavements of different thicknesses may be made by employing a thicker or thinner shoe 28, and by adjusting the shoe mechanism C.

In order to draw the plow, I prefer to equip

the draw plate 1 with shackles 29 to which a chain 30 is secured. By employing a link 31 to connect chain 30 and the chain 32 which is secured to a tractor or other power machine, a shifting of the direction of the force may
 70 be readily accomplished by moving link 31 to the right or to the left along chain 30.

In the operation of the plow, the top frame members of the frame A are placed upon the concrete slab, as illustrated more clearly in
 75 Fig. 4, with the shoe 28 resting upon the concrete and with the adjustable shoe C resting upon the bottom of the trench adjacent the concrete slab. The screw mechanism is adjusted so as to have the top frame A substantially parallel with the face of the concrete
 80 and with the rollers 18 bearing against the outer edge of the pavement slab. The rollers 18 may be adjusted so as to cause the blades B to take a wide or narrow bite, depending
 85 upon the character of the earth which is being cut away and the power available for pulling the plow. If desired, the plow may be drawn along the pavement more than once, the rollers being adjusted so as to cause the
 90 blades to take a deeper bite each time.

Accurate positioning of the plow blades is secured and maintained by contact of the overhanging frame structure with the top of the pavement slab.
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The soil which is cut away by the plow blades is turned by the blades and supporting plate members, and by the wide metal strap 15 toward the outer side of the plow, and the clean-up member 20 removes any
 100 loose soil not thrown out by the blades.

When it is desired to adjust the length of the plow blades, bolts 12 may be withdrawn and passed through different holes in the blades and then secured in position.
 105

The direction of pull may be controlled by shifting link 31 along the chain 30. With the chain secured as set out in the drawing, the tractive force tends to hold the plows inwardly against the soil, while at the same time permitting the plow to be drawn forward.
 110

The foregoing detailed description has been given for clearness of understanding only and no unnecessary limitations should
 115 be understood therefrom, but the appended claims should be construed as broadly as permissible in view of the prior art.

I claim:

1. In plow apparatus of the character set forth, a top frame adapted to be slidably supported upon the top of a pavement slab, a side support adapted to flank the edge of said slab, a plow blade carried by said support so as to under-cut said slab, and an adjustable shoe engaging said side support and adapted to rest upon the trench adjacent said slab.
 120
 125

2. In plow apparatus of the character set forth, a plow frame adapted to slidably engage the top of a pavement and having a de-
 130

pending portion flanking the edge of said pavement, a plow blade carried by said depending portion at a spaced distance, and an adjustable shoe support engaging said depending frame portion and having a shoe adapted to rest upon a trench adjacent said pavement.

3. An under-cutting plow comprising, a top frame adapted to slidably engage the top surface of a pavement, a depending frame connected to said top frame, a blade supported by said depending frame, and guide rollers supported so as to contact the side wall of said pavement.

4. An under-cutting plow comprising, a frame having a top portion adapted to overlie and slidably engage a pavement, a depending lateral portion connected to said top portion and a blade supporting portion extending inwardly from said depending frame portion, a blade supported by said blade supporting frame portion, and adjustable roller guides supported by said frame and adapted to abut the edge of said pavement.

5. An under-cutting plow comprising, a frame having a top portion adapted to overlie and slidably engage a pavement, a depending lateral portion connected to said top portion, and a blade supporting portion extending inwardly from said depending frame portion, a blade supported by said blade supporting frame portion, and an adjustable stop supported by said frame and adapted to abut the edge of said pavement.

6. An under-cutting plow comprising, a frame provided with a top portion adapted to overlie and slidably engage the top surface of the pavement, and a depending blade supporting portion, a plow blade supported by said depending portion, said frame being provided with a plurality of spaced openings, a pin adapted to engage said openings, and a hollow roller secured in rotatable position by said pin.

7. An under-cutting plow comprising, a frame having a top portion adapted to overlie a pavement and a depending blade supporting portion, a blade supported by said depending frame portion, and adjustable stop means carried by said frame adapted to engage the side of said pavement and to limit the width of the bite of said plow blade.

8. An under-cutting plow comprising, a frame having a portion adapted to slidably engage the top of a pavement and a depending blade supporting portion, blades carried by said depending frame so as to under-cut said pavement slab, and a metal strap reinforcing the inner portions of said blades.

9. An under-cutting plow comprising, a frame having a top portion adapted to be slidably supported upon the top of a pavement and a depending blade supporting portion adapted to flank the side of said pavement, blades supported by said depending

frame portion, and a wide metal strap secured to said depending frame member and supporting the inner portions of said blades.

10. An under-cutting plow comprising, a frame having a traction arm adapted to overhang and to be slidably supported on the top surface of the pavement, a depending frame member secured to said arm, a plow blade supported by said frame at a spaced distance below said arm, and a hitch-chain securing said traction arm to a power machine.

11. An under-cutting plow comprising, a traction arm adapted to be slidably supported upon the top of a pavement, a depending frame secured to said arm, a blade carried by said frame so as to under-cut said pavement, a chain having its ends secured to opposite end portions of said traction arm, a shiftable link member engaged by said chain, and means for connecting said link to a traction machine.

12. An under-cutting plow comprising, a traction arm adapted to be slidably supported upon the top of the pavement, a lateral frame member secured to said arm and adapted to flank the edge of said pavement, oblique struts connecting said traction arm to said lateral frame, an adjustable shoe member supporting the front outer corner of said arm, blade supporting plates secured to said oblique struts, blades supported by said plates in substantial alinement with said struts, and adjustable stop means adapted to engage the side of said pavement.

13. In combination, a frame adapted to be slidably supported upon the top of the pavement, a lateral frame secured to said first mentioned frame and adapted to flank said pavement, a blade supported by said frame members, and a deflector plate supported at the rear end of said lateral frame and adapted to follow in the path of said blade.

14. A plow comprising, a traction arm adapted to be slidably supported upon the top of the pavement, an adjustable shoe supporting the outer end of said arm, a lateral beam flanking the said pavement, oblique struts connecting said traction arm to said lateral beam, blade supporting plates secured to the rear end portions of said struts, blades carried by said plates, a metal strap secured to said beam and supporting the inner ends of said blades, and adjustable stop means engaging said struts and adapted to engage the side of said pavement to limit the width of the bite of said blades.

15. An under-cutting plow comprising, a frame having its top portion supported in contact with the top surface of a pavement, a depending frame portion carried by the top frame portion, a plow blade supported by said depending frame portion, and adjustable means for slidably supporting the frame adjacent the edge of said pavement.

16. An under-cutting plow comprising, a
frame having its top portion supported in
contact with the top surface of a pavement,
a depending frame portion carried by the
5 top frame portion, a plow blade supported
by said depending frame portion and
adapted to under-cut said pavement, and ad-
justable means for supporting the frame ad-
jacent the edge of said pavement.

10 EARL FRASER.

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