Aug. 13, 1957 D. F. PRZYBYLSKI 2,802,584

DIPPER STICK EXTENSION

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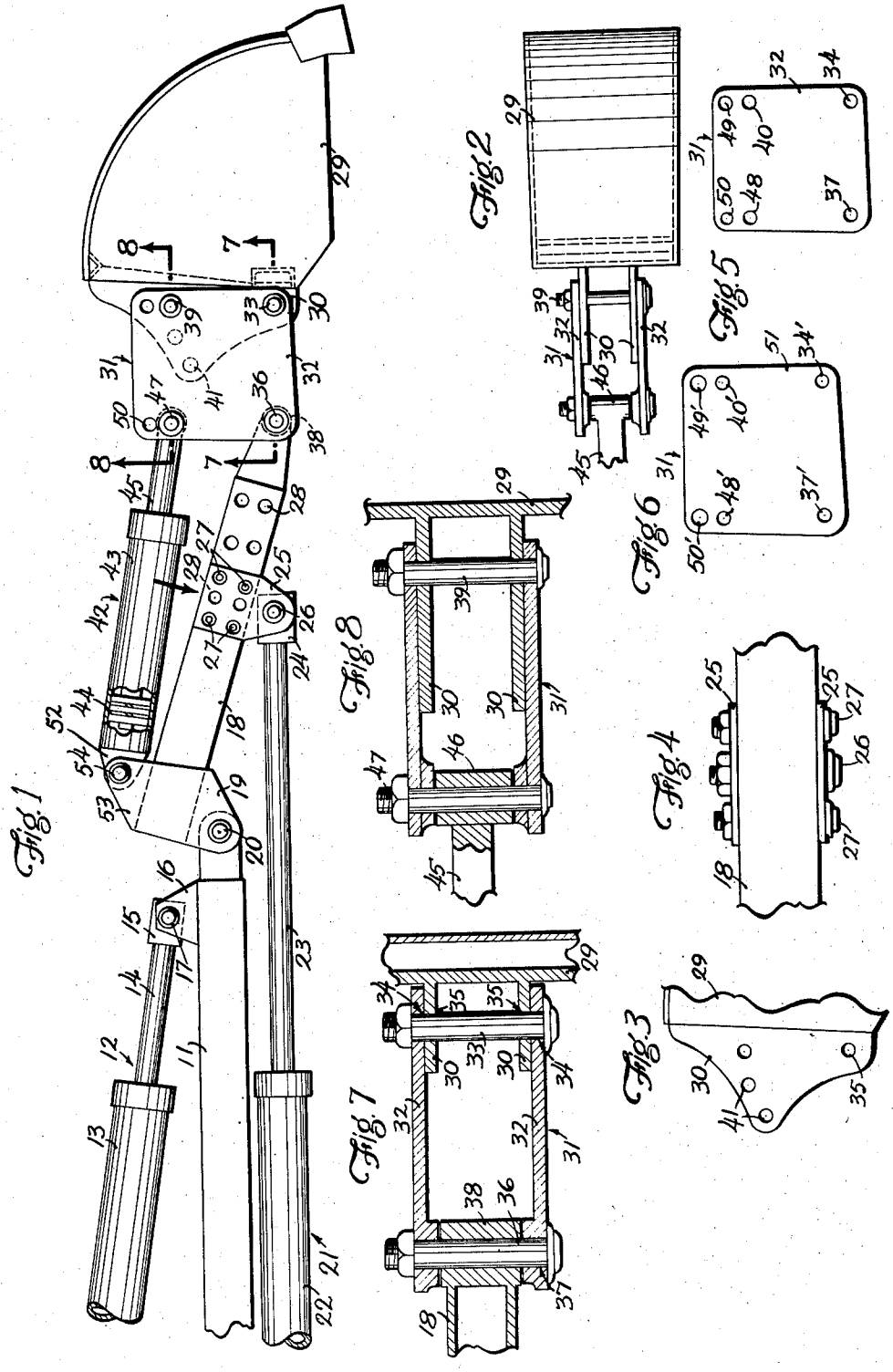

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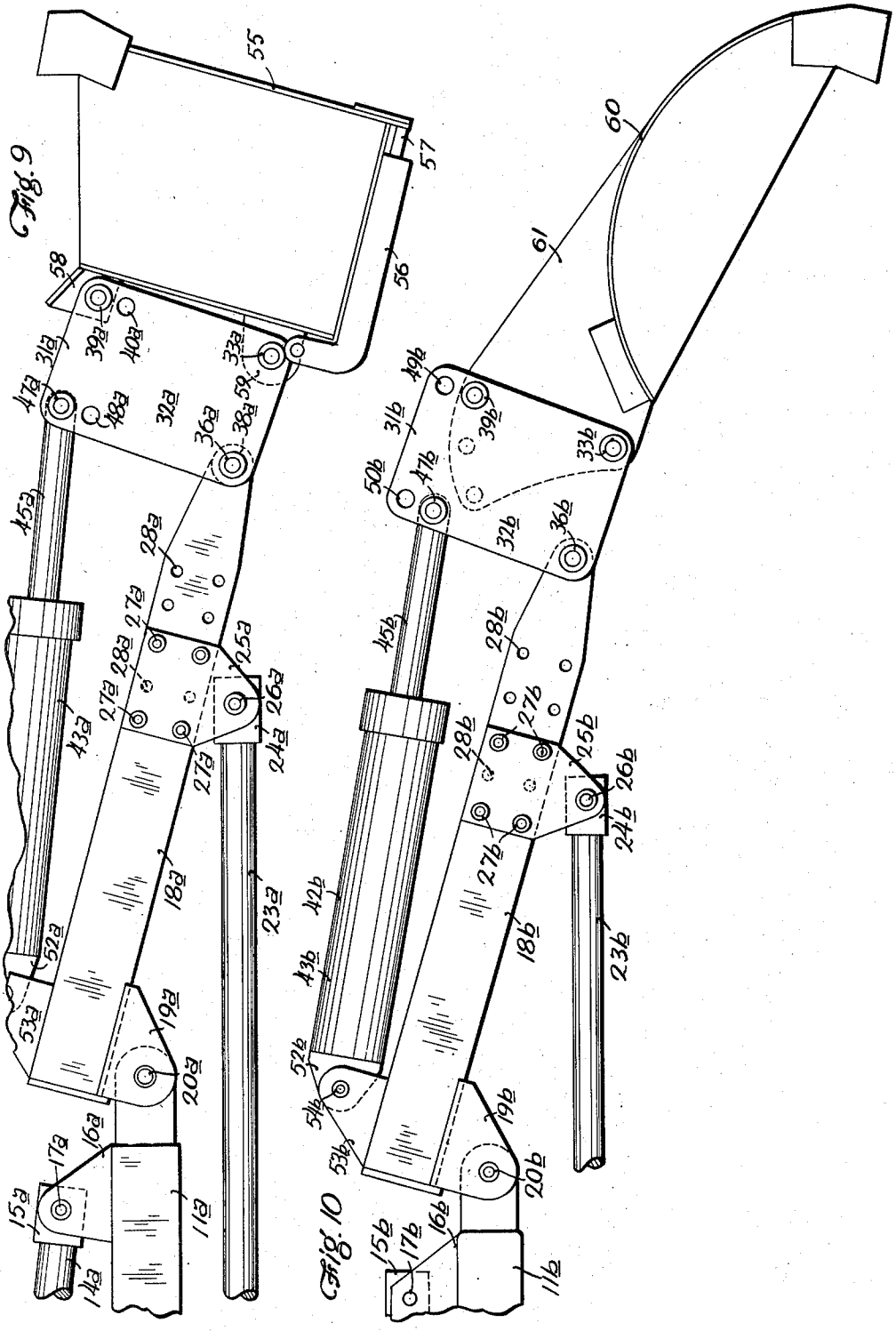

FIG. 9

FIG. 10

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DIPPER STICK EXTENSION

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5 Claims. (Cl. 214—138)

My present invention relates to improvements in dipper sticks for loading buckets, half-shell buckets, back hoe buckets and the like.

The primary object of this invention is to provide a novel extension for a dipper stick to increase the operative length thereof.

A further object is to provide interchangeable and usable extensions for dipper sticks to vary the operative length thereof.

A still further object is to provide an extension for a dipper stick for holding a bucket in different pitch relation to said extension.

These and other objects of the invention will be apparent from the following description, reference being had to the drawings.

To the above end, generally stated, the invention consists of the novel devices and combination of devices hereinafter described and defined in the claims.

In the accompanying drawings, which illustrate the invention, like characters indicate like parts throughout the several views.

Referring to the drawings:

Fig. 1 is a side elevational view of the invention embodied in a digger back hoe bucket assembly;

Fig. 2 is a plan view of the invention and the back hoe bucket as shown in Fig. 1;

Fig. 3 is a fragmentary detail view in side elevation of the rear end portion of the back hoe bucket;

Fig. 4 is a fragmentary detail in plan looking at the dipper stick, as indicated by the arrow shown in Fig. 1;

Fig. 5 is a side elevational view of one of the extension plates shown in Fig. 1;

Fig. 6 is a side elevational view of one of the side plates of the dipper stick extension having a longer operative length from the extension shown in Figs. 1 and 5;

Figs. 7 and 8 are detail views taken on the lines 7—7 and 8—8, respectively, of Fig. 1, on an enlarged scale; and

Figs. 9 and 10 are views corresponding to Fig. 1 but somewhat more fragmentary on an enlarged scale, and in place of the back hoe bucket show, respectively, a loading bucket and a half-shell bucket.

Referring first to the invention shown in Figs. 1 through 6, the numeral 11 indicates a boom, only the front end portion being shown. A hydraulic ram 12 is provided for raising and lowering the boom and includes a cylinder 13, a cooperating piston, not shown, having a piston rod 14. In actual use, the boom 11 and the ram 12 will be pivoted to a turnpost or other support, not shown. The piston rod 14 at its outer end portion is provided with a head 15 that extends between a pair of upstanding ears 16, fixed to the outer end portion of the boom 11, and attached thereto by a pivot pin 17.

A dipper stick 18, that is rectangular in cross-section, has on its outer end portion a pair of depending ears 19 between which the boom 11, at its outer end portion, extends and is attached to said ears by a pivot pin 20, to swing in the plane of the boom 11.

The dipper stick 18 is swung relative to the boom 11 by a hydraulic ram 21 that includes a cylinder 22 and a cooperating piston, not shown, having a piston rod 23. On the outer end portion of the piston rod 23 is a head 24 that extends between a pair of ears 25 that extend below the dipper stick 18 and said head is attached to the ears 25 by a pivot pin 26. In actual use, the cylinder 22 will be pivoted to the boom 11. The ears 25 are, as shown, flat plates that overlap the dipper stick 18 on opposite sides and are detachably secured thereto by four nut-equipped bolts 27. These bolts 27 extend through aligned holes 28 in the ears 25 and the dipper stick 18. As shown, there are sufficient holes 28 in the dipper stick 18 to permit three different adjustments of the ears 25 longitudinally of said dipper stick.

The numeral 29 indicates a back hoe bucket as an entirety except for two large laterally spaced ears 30 fixed to the back of said bucket at its transverse center and project rearwardly therefrom in the plane of the bucket 29.

Referring now in detail to the invention, which also includes the adjustable ears 30 which is an extension 31 of the dipper stick 18. The purpose of this extension 31 is to permit the bucket 29 to dig deeper and work closer to the machine on which the assembly shown in Fig. 1 is mounted.

The extension 31 comprises a pair of large flat substantially rectangular superimposed plates 32 between which the ears 30 project. The extension plates 32 at their lower right-hand corner portions are pivoted to the lower portions of the ears 30 by a nut-equipped bolt 33 that extends through aligned holes 34 and 35 in said plates and ears, respectively, and hold the plates 32 clamped against the ears 30.

The dipper stick 18, at its outer end portion, extends between the extension plates 32 and is pivoted thereto by a nut-equpped bolt 36 that extends through aligned holes 37 in the lower left-hand corner portion of the plates 32 and the head 38 on the outer end portion of the dipper stick 18. This head 38 acts as a spacer for the extension plates 32, Fig. 2.

The extension plates 32, at their upper right-hand portion, are adjustably secured to the dipper ears 30 by a nut-equipped bolt 39 that extends through aligned holes 40 in the plates 32, at their upper right-hand corner portions, and the right-hand pair of holes 41 in the dipper ears 30. As shown, there are three pairs of holes 41 in the bucket ears 30 circumferentially spaced about the axis of the pivot bolt 33. The purpose of this adjustment of the plates 32 relative to the bucket ears 30 is to change the pitch of the bucket 29 relative to the extension 31. It will be noted that the adjustment of the plates 32 relative to the bucket ears 30 corresponds to the adjustment of the ears 25 relative to the dipper stick 18.

The bucket 29 is tilted relative to the dipper stick 18 by a hydraulic ram 42 comprising a cylinder 43 and a cooperating piston 44 having a piston rod 45. A head 46 on the outer end of the piston rod 45 extends between the extension plates 32 and is pivotally attached thereto by a nut-equipped bolt 47. This bolt 47 extends through aligned holes 48 in the upper left-hand corner portions of the extension plates 32 and the piston rod head 46 which acts as a spacer for said plates.

Formed in the extension plates 32 above the holes 40 and 48 are holes 49 and 50, respectively, for a bucket having ears different from the bucket ears 30. Fig. 6 shows one of the plates 61 of a dipper stick extension for increasing the operative length of the dipper stick 18 over that of the extension 31. The holes in the extension plate 51 are given the same reference numerals as the corresponding holes in the plate 32 followed by a prime.

The cylinder **43** has on its rear end a pivot base **52** that extends between a pair of upstanding ears **53** fixed to the rear end portion of the dipper stick **18** and is attached thereto by a pivot pin **54**.

Referring now in detail to the invention shown in Fig. 9, the invention is embodied in an assembly corresponding to that shown in Fig. 1 except a loading bucket **55** is substituted for the back hoe bucket **29**.

Parts shown in Fig. 9 that correspond to like parts shown in Fig. 1 are given the same reference numerals followed by the letter *a*. The bottom member **56** of the bucket **55** is hinged to open outwardly and is held closed by a latch **57**. Fixed to the back of the bucket is an upper pair of ears **58** and a lower pair of ears **59**, only one of each being shown.

The extension **31a** is attached to the bucket ears **58** and **59** by the bolts **39a** and **33a**, respecively. It will be noted that the bolts **39a** and **47a** extend through the uppermost holes in the extension plates **31a**.

Referring now in detail to the invention shown in Fig. 10, the invention is embodied in an assembly corresponding to that shown in Fig. 1, except a half-shell bucket **60** is substituted for the back hoe bucket **29**. This bucket **60** has a large pair of rearwardly projecting ears **61**, only one of which is shown.

Parts in Fig. 10 that correspond to like parts in Fig. 1 are given the same reference numerals followed by the letter *b*. The extension **31b** is attached to the ears **61** in the same manner in which the extension **31** is attached to the ears **30**.

While there are herein disclosed but a limited number of embodiments of the structure, process and product of the invention herein presented, it is possible to produce still other embodiments without departing from the inventive concept herein disclosed, and it is desired, therefore, that only such limitations be imposed on the appended claims as are stated herein, or required by the prior art.

What I claim is:

1. An extension member insertable between the outer end portions of a dipper stick and a bucket to increase the operative length of the dipper stick, a ram between the dipper stick and the extension plate and pivoted to the dipper stick, said extension member comprising a pair of substantially rectangular superimposed plates having in each of their corner portions a pair of aligned holes for pins to attach the plates fixedly to the ears of a bucket and for pivotally attaching a dipper stick and a ram to said plates.

2. The combination with a dipper stick, a hydraulic ram, and a bucket having fixed on its back upright laterally spaced ears, of an extension member between the outer end portion of the dipper stick, the ram and the bucket to increase the operative length of the dipper stick, said extension member comprising a pair of substantially rectangular superimposed plates overlapping the ears of the bucket and between which plates the dipper stick and the ram project, a pivot pin extending through aligned holes in the plates and the ears, a removable pin extending through aligned holes in the plates and any one of a plurality of aligned holes in the ears and circumferentially spaced about the axis of the pivot pin, and two other pivot pins, one of which extends through aligned holes in the plates and the dipper stick and the other of which extends through aligned holes in the plates and the ram.

3. The structure defined in claim 2 in which the dipper stick and the ram act as spacers for the plates.

4. The combination with a dipper stick, a hydraulic ram and a bucket having fixed on its back upright laterally spaced ears, of an extension member between the outer end portion of the dipper stick, the ram and the bucket to increase the operative length of the dipper stick, said extension member comprising a pair of substantially rectangular superimposed plates overlapping the ears of the bucket and between which plates the dipper stick and the ram project, a pair of pins extending through aligned holes in the plates and the ears, and a pair of pivot pins, one of which extends through aligned holes in the plates and the dipper stick and the other of which extends through aligned holes in the plates and the ram.

5. An extension member insertable between the outer end portion of a dipper stick and a bucket to increase the operative length of the dipper stick, means for pivotally attaching the dipper stick to the extension member, other means for attaching the extension member to the bucket and holding the same fixed, and means attached to the extension member for operating the same to tilt the bucket relative to the dipper stick and hold said bucket where tilted, said means for attaching the extension member to the bucket being a pivot member and having adjustable means for varying the pitch of the bucket relative to the extension member.

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