Sept. 20, 1960 R. J. ALTGELT ET AL 2,953,211

PLOW ATTACHMENT

Filed Nov. 19, 1956 2 Sheets-Sheet 2

FIG. 3

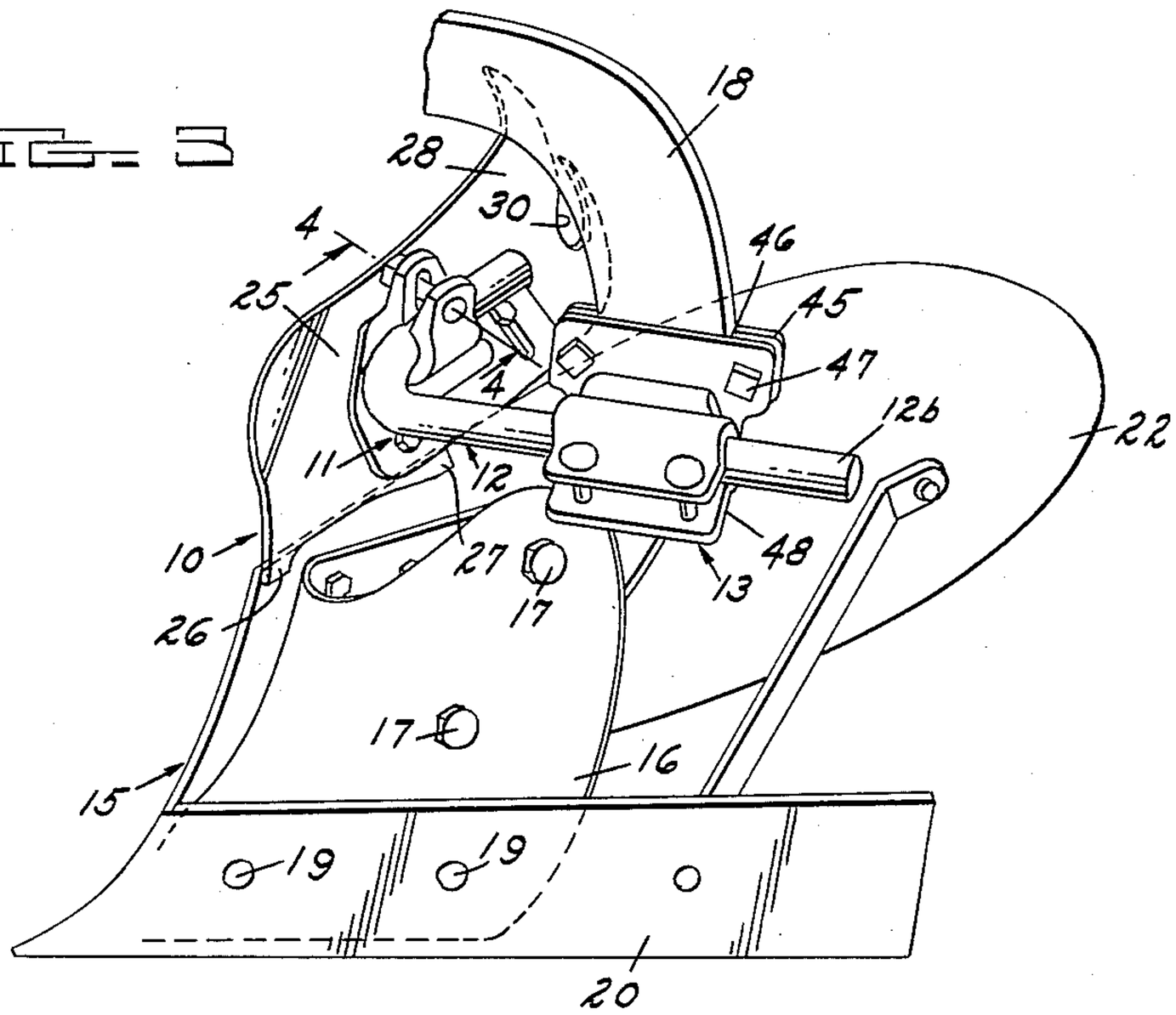


FIG. 6

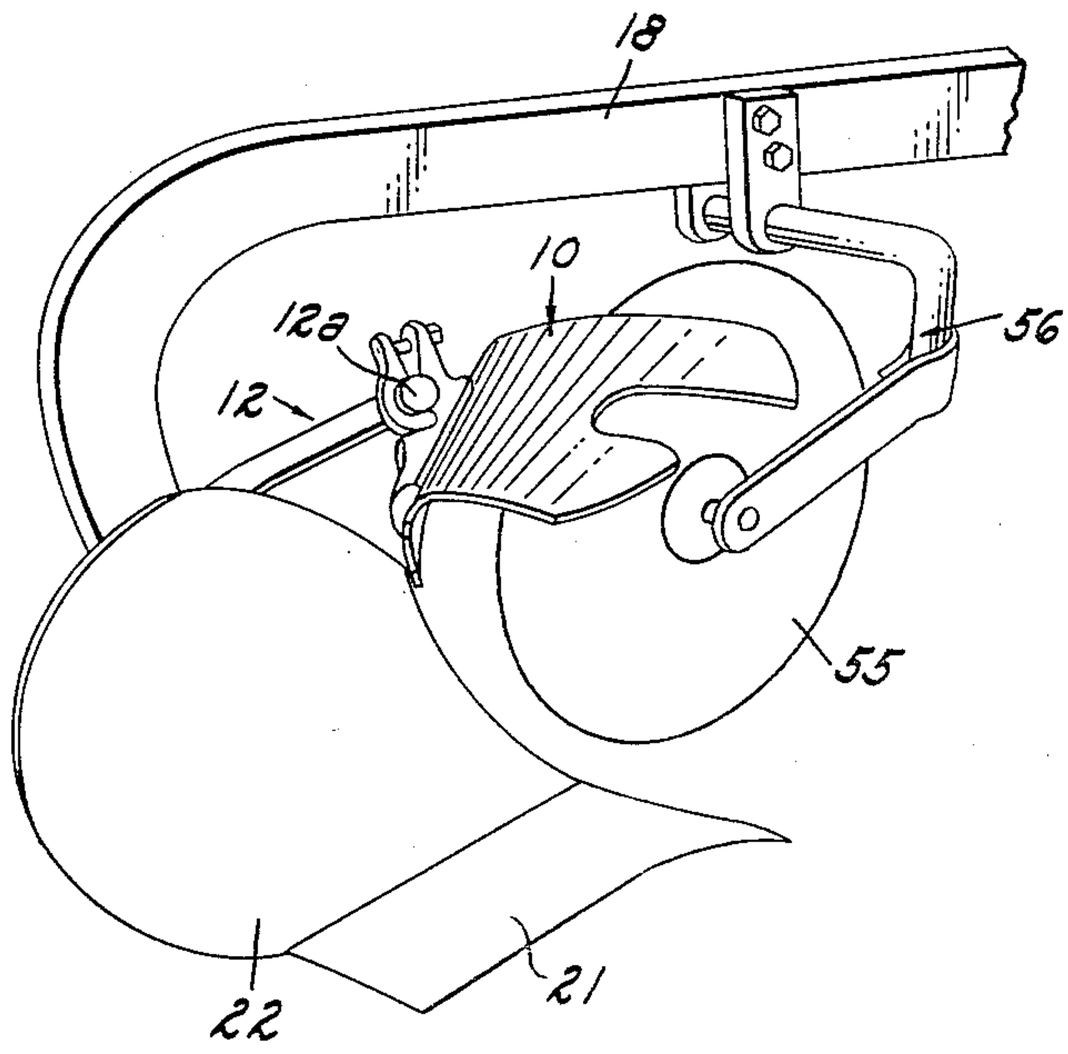
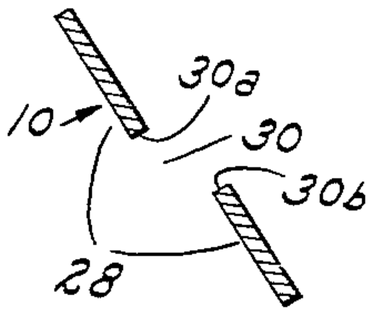


FIG. 5



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Sept. 20, 1960 R. J. ALTGELT ET AL 2,953,211

PLOW ATTACHMENT

Filed Nov. 19, 1956 2 Sheets-Sheet 1

FIG. 1

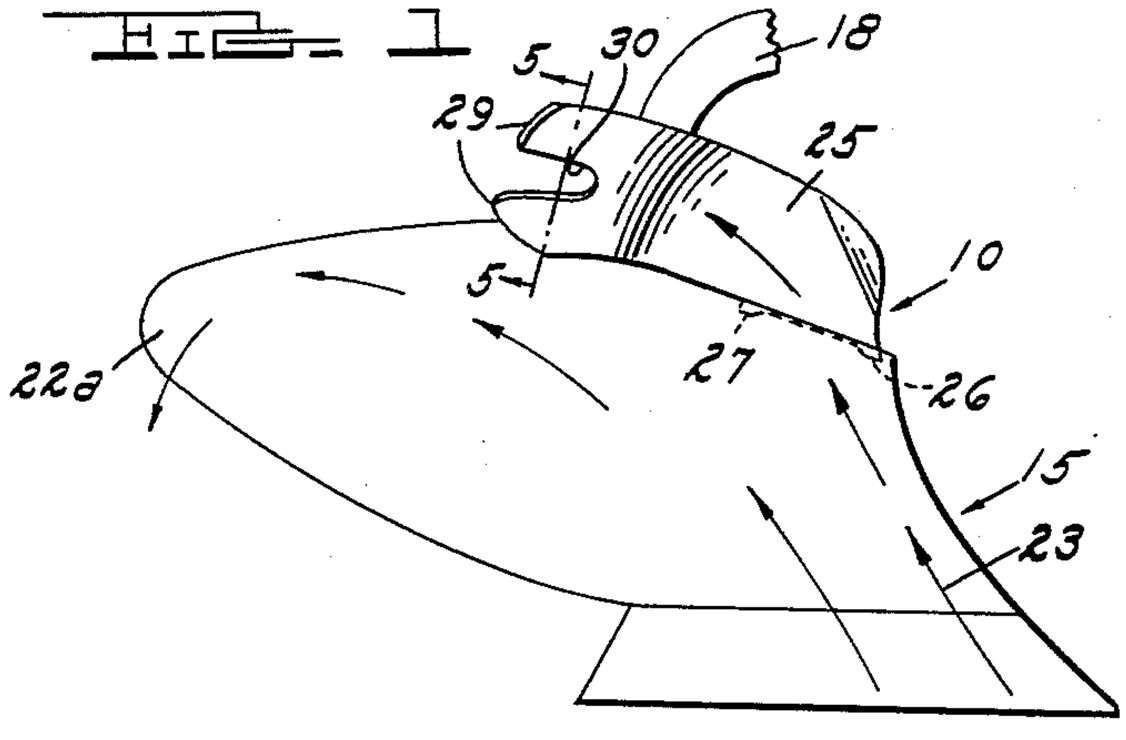
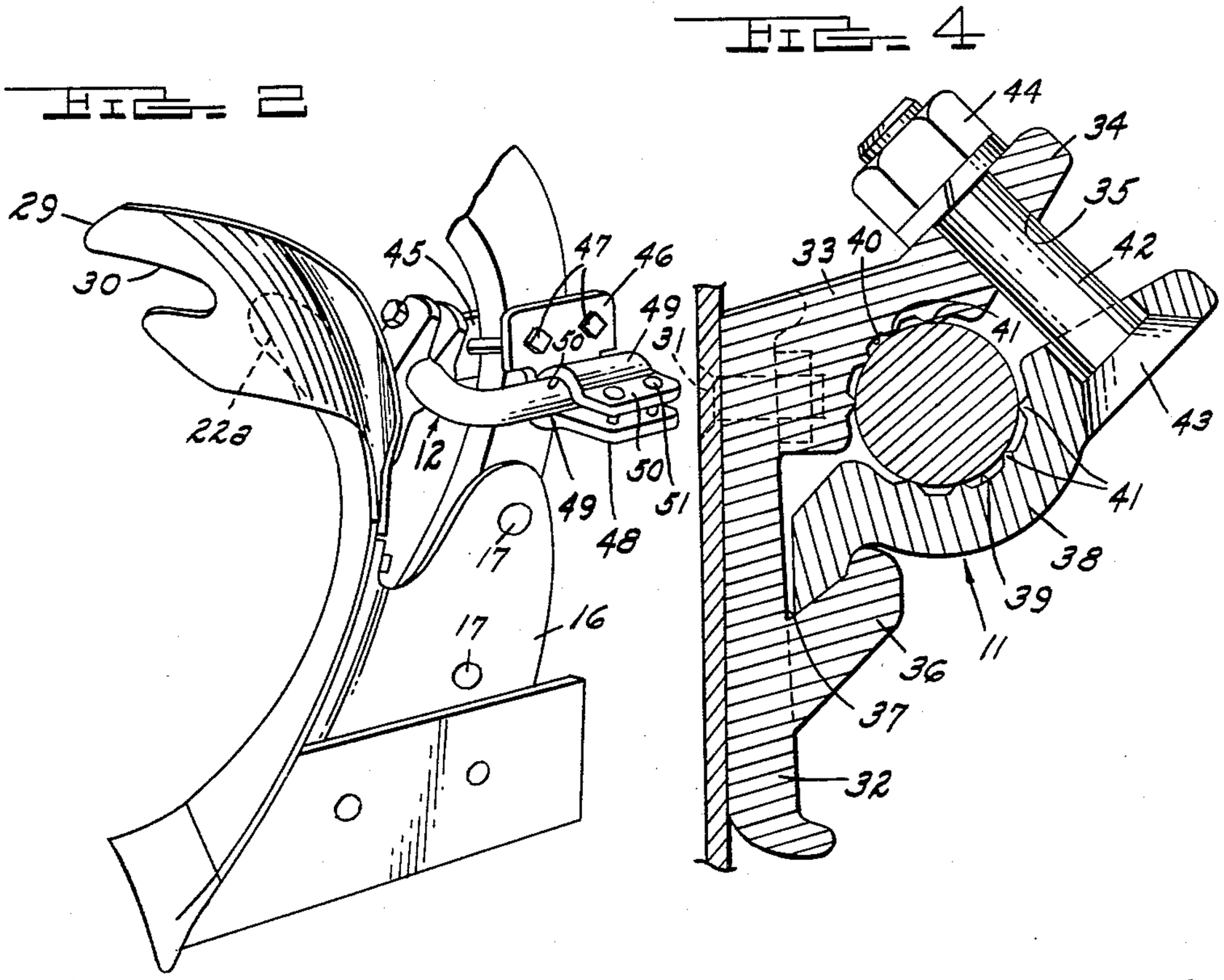


FIG. 4



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PLOW ATTACHMENT

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1 Claim. (Cl. 172—736)

The present invention relates to a plow attachment and, more particularly, to an auxiliary moldboard for improving the trash-burying efficiency of a conventional plow moldboard.

The problem of adequately covering surface trash, such as corn stalks, weeds, cover crops, etc., during plowing is one which plagues the farmer. To insure proper soil preparation and adequate decomposition of such trash, it must be completely buried by the soil turned during operation of a moldboard plow.

To enhance such trash burial, various forms of "coverplates" or auxiliary moldboards have been previously proposed. However, the devices of this type heretofore available suffer from several deficiencies, as follows:

(1) The coverplates are fitted to and superimposed on the upper moldboard edges. Unless an extremely accurate fit is obtained, a dirt-catching and trash-hanging edge results.

(2) The coverplate receives no support from the moldboard.

(3) The coverplate discharge end lies almost normal to the path of travel of the plow, resulting in abnormally high soil-to-board pressure and causing soil sticking.

(4) In extremely sticky or moldboard-adherent soil, the coverplate can function more efficiently as a jointer, i.e., in advance of the moldboard, than as an auxiliary moldboard, i.e., superimposed over the main moldboard. No previous coverplate is adaptable to both such uses.

It is, therefore, an important object of this invention to provide an improved auxiliary moldboard for a moldboard plow.

Another object of this invention is the provision of an auxiliary moldboard adapted to be fitted to moldboards of various shapes and sizes without custom fitting and without a resultant dirt-catching and trash-hanging edge therebetween.

It is a further object to provide a trash-burying coverplate which is partially supported by a primary plow moldboard.

Yet another object is the provision of an auxiliary moldboard in which the normally high soil-to-board pressure is materially reduced to prevent sticking of soil to the board.

It is a still further object of this invention to provide a coverplate alternately utilizable as an auxiliary moldboard superimposed over the plow primary moldboard or as a jointer in advance of the primary moldboard.

On the drawings:

Figure 1 is a front elevational view of a plow provided with an auxiliary moldboard of the present invention;

Figure 2 is a front perspective view illustrating the plow of Figure 1;

Figure 3 is a rear perspective view of the plow of Figure 1;

Figure 4 is an enlarged sectional view taken along the plane 4—4 of Figure 3;

Figure 5 is a sectional view taken along the plane 5—5 of Figure 1; and

Figure 6 is a perspective view illustrating the plow of Figure 1 with the auxiliary moldboard in an adjusted position.

The auxiliary moldboard or "coverplate" of the present invention comprises the auxiliary moldboard proper indicated generally at **10** and a moldboard bracket indicated at **11** for securing the auxiliary moldboard to an adjustment crank **12**. The adjustment crank **12** is in turn connected through an attachment bracket **13** to a plow indicated generally at **15**.

While a specific plow **15** is illustrated in the drawings, it will be appreciated that the device of the present invention is utilizable with various types of moldboard plows, and the plow illustrated is merely representative of these various types.

The specific illustrated plow comprises a frog **16** which is secured through bolts **17** to a beam **18**. Secured to one face of the frog by bolts **19** is a landside **20**, while secured to the other face of the frog **16** is a lower plowshare **21** and a moldboard **22**. The operation of this plow **15** will be readily appreciated by those skilled in the art, the share **21** severing the soil beneath the surface thereof, the forward movement of the plow forcing the severed soil to travel upwardly along the moldboard **22**. The moldboard is angularly related to the path of travel of the plow so that the general soil flow occurs in the direction of arrows **23** of Figure 1.

By operation of the plow **15**, the soil is inverted and discharged from the rear end **22***a* of the moldboard. In the plowing of sod or trash-free soil, the moldboard **22** is generally effective to invert the soil layer cut loose by the share **21** so that the surface layers of the soil are buried beneath the soil lower layers. However, in the plowing of land covered with surface trash, such as corn stalks, weeds, cover crops, etc., the inversion by operation of the moldboard alone is insufficient to fully bury the trash.

The auxiliary moldboard or coverplate **10** of the present invention is intended primarily to aid in covering this surface trash so that it may be buried for complete decomposition and proper soil preparation. More specifically, the moldboard **10** is adapted to be superimposed generally over the conventional plow moldboard **22**. As best illustrated in Figures 1, 2 and 3, the moldboard **10** comprises a first substantially straight portion **25** which is provided with a depending marginal flange **26**. This depending flange **26** terminates in a substantially vertical shoulder **27**. The flange **26** is adapted to be inserted behind the upper edge of the moldboard **22**. By inserting the flange **26** behind the moldboard **22**, the difficulties of forming a perfect joint between the auxiliary moldboard **10** and the main moldboard **22** are avoided, since there is no mating engagement between the two edges, and the free upper edge of the primary moldboard **22** will not interfere with proper soil and trash flow or transfer from the primary moldboard **22** to the auxiliary

moldboard **10**. The vertical dimension of the shoulder **27** determines the extent to which the flange **26** can be inserted behind the upper edge of the moldboard **22**, and the outer arcuate portion **28** of the moldboard **10** projects forwardly of the corresponding portion of the primary moldboard **22**, with the lower edge of the moldboard **10** and the upper edge of the primary moldboard **22** registering adjacent the shoulder **27**, or the point of transition between the relatively straight forward portion of the secondary moldboard to the arcuate rear portion **28** thereof.

The outer arcuate portion **28** of the moldboard curves laterally with increasing abruptness until the outer terminal end portions **29** of the auxiliary moldboard lie substantially normal to the path of travel of the plow, as best seen in Figures 2 and 3. It will be appreciated that this abrupt turning movement of the soil by the auxiliary moldboard **10** creates substantial forces which act normally to the surface of the moldboard **10** and which force the dirt into the moldboard surface. To prevent sticking of the dirt to the auxiliary moldboard **10** in this area of greatest pressure, the auxiliary moldboard is provided with an outwardly opening notch **30** which reduces the area of the moldboard which is subjected to this pressure and which accommodates the relief of this pressure by allowing the dirt to fall through the notch. The extent of the notch **30** is such that it will not readily accommodate the flow therethrough of corn stalks, weeds and similar trash, so this notch does not materially impede the trash conveying and inverting properties of the secondary moldboard **10**.

The secondary moldboard **10** is secured in its positions illustrated in the drawings by means of a bracket **11**, illustrated in Figure 4 of the drawings. This bracket **11** is secured to the auxiliary moldboard by plow bolts **31** which connect the moldboard to a main bracket casting **32**. This main casting **32** includes an integrally formed and rearwardly directed upper flange **33** which terminates in an upwardly directed lip **34** apertured as at **35**. A second lower lip **36** is formed in the casting **32** to provide a rearwardly opening notch **37** into which is inserted a clamping arm **38** having a medial, generally semicylindrical recess **39** which registers with a similar recess **40** formed in the upper flange **33**. These recesses **39** and **40** are provided with integral, longitudinally-extending teeth **41** which are adapted to engage the outer periphery of the adjustment crank **12**. The teeth **41** are urged into the adjustment crank peripheral portions by a bolt **42** having a head **43** reacting against the terminal end of the arm **38** and a nut **44** reacting against the lip **34** of the flange **33**.

The bracket **11** is oriented on the board **10**, so that the recesses **39** and **40** extend generally longitudinally of the board to receive one end **12***a* of the crank **12**. The other end **12***b* of the crank **12** lies substantially normal to the end **12***a* thereof and is adapted to be received by the beam bracket **13**.

This beam bracket **13** comprises a pair of clamping plates **45** and **46** disposed on opposite sides of the beam **18** and is adapted to be clamped to the beam by suitable means, as by bolts **47**. The plate **46** is provided with a lower integral flange **48** which has a longitudinally extending recess **49** adapted to receive the end **12***b* of the crank **12**, and another clamping plate **50** is pivotally connected to the plate **46**, the plate **50** having a recess **50***a* therein similar to the recess **49**. The recesses **49** and **50***a* of the bracket **13** are preferably provided with longitudinal teeth similar to the teeth **41** hereinbefore described, and these teeth are urged into biting engagement with the end **12***b* of the crank **12**, as by bolts **51**. It will be readily appreciated that the adjustment crank **12** is adjustable both longitudinally and rotationally with respect to either of the brackets **11** or **13** so that

the moldboard may be positioned in its illustrated positions with respect to the moldboard **22**.

As hereinbefore described, the moldboard **10** is conventionally used in its position generally overlying the main moldboard **22**, but the secondary moldboard **10** may also be utilized in a "jointer" position, as illustrated in Figure 6.

In this position, the forward or flanged end **26** of the moldboard **10** is depressed and is positioned in advance of the upper forward or "shin" edge of the moldboard intermediate the moldboard **22** and a rolling coulter **55**. Also, the board is tilted about the axis of the crank arm end **12***a*, so that the coverplate **10** deflects trash, stubble, and the surface soil layer downwardly in the path of travel of the main moldboard **22**. This coulter is carried by a conventional fork indicated generally at **56** and suspended from the beam **18**. With the auxiliary moldboard in its position of Figure 6, the board **10** acts as a jointer in removing surface portions of the furrow before these portions of the furrow have been engaged by the moldboard. We have found that this position may be advantageously utilized in extremely sticky soils with the surface trash being inverted by the auxiliary moldboard before engagement of the remainder of the soil with the primary moldboard **22**. This positioning of the auxiliary moldboard is made possible by the effective universal joint provided by two brackets **11** and **13** and the adjustment crank **12**.

Thus, it will be seen that the auxiliary moldboard serves a dual purpose. The elongated crank arm **12** and the clamps **11** and **13** accommodate the mounting of the board **10** in either its superimposed position of Figures 1–5 or its advanced jointer position of Figure 6. The tilting motions provided by the clamps **11** and **13** and the telescopic arm-to-clamp movement yields an accurate, truly universal adjustment for the auxiliary moldboard.

The end result of the use of the auxiliary moldboard or coverplate is the same regardless of its use position. In either event, the trash is inverted and placed in front of the primary or main moldboard for covering by the normal moldboard operation. The free end portion **28** of the board **10** is provided with a slight helical twist, as well as an arcuate forward bend so that the board functions to throw trash, stubble, and the like downwardly, no matter which position the board occupies.

The positioning of the flange **26** behind the primary moldboard **22** affords support for the board **10**, while also eliminating the need for custom fitting two mating surfaces. The notch **30** relieves soil pressure on the board, while accommodating travel of trash along the length of the board **10**. Since the board **10** is helically twisted along its length, the lower edge **30***b* of the notch **30** is positioned below and behind the upper edge **30***a* and any "hanging-up" of trash or stubble in the notch is prevented.

For the reasons hereinbefore recited, it will be appreciated that this invention provides a new, improved and efficient plow coverplate or auxiliary moldboard.

We claim:

An auxiliary moldboard for attachment to a plow to be superimposed generally over the plow main moldboard, comprising in combination: a pair of forwardly and rearwardly spaced tabs extending downwardly from and coplanar with the lower edge of the leading portion of said auxiliary moldboard, said tabs being inserted behind the upper edge of the main moldboard so that the lower edge of the leading portion of the auxiliary moldboard is below and behind the leading portion of the upper edge of the main moldboard, said auxiliary and main moldboards being substantially contiguous adjacent the leading portions of their lower and upper edges, respectively, whereby a relief area is provided immediately above the leading portion of the upper edge of said main moldboard, the medial portion of the lower edge of said

auxiliary moldboard crossing over and engaging the upper edge of the main moldboard adjacent the rearmost one of said tabs, said auxiliary moldboard having an arcuate trailing portion which lies in front of the main moldboard at a location spaced rearwardly from the leading portion thereof and which extends substantially normal to the path of travel of the plow; and means for holding said auxiliary moldboard fixedly in position with said tabs behind and contacting the upper leading portion of said main moldboard.

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