United States Patent [19]

Garrison

[11] 3,733,798

[45] May 22, 1973

[54] **PRESS FOR UNINTERRUPTED FILLING OF STACK FORMING WAGONS**

[75] Inventor: **Harold Keith Garrison,** Newton, Kans.

[73] Assignee: **Hesston Corporation,** Hesston, Kans.

[22] Filed: **Dec. 17, 1971**

[21] Appl. No.: **209,312**

[52] **U.S. Cl.** **56/350,** 56/364, 100/215

[51] **Int. Cl.** **A01d 87/00**

[58] **Field of Search**.....56/16.4, 16.6, 350–353, 56/364; 214/83.28, 519–522; 100/215

[56] **References Cited**

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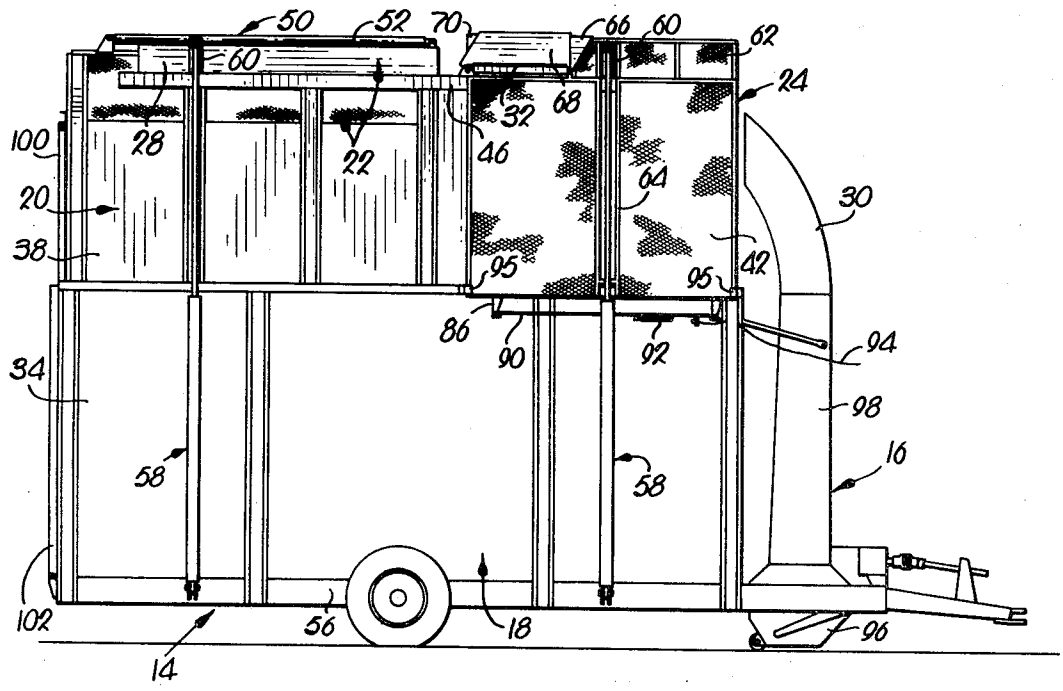
3,556,327 1/1971 Garrison.....214/522

Primary Examiner—Louis G. Mancene
Assistant Examiner—J. A. Oliff
Attorney—Schmidt, Johnson, Hovey & Williams

[57] **ABSTRACT**

In the stacking of hay or other crops, a windrow or swath is lifted off the ground, fed into a pile collected by a vehicle-supported, stack forming body and the pile compressed from time to time in the body, all in a continuous operation as the vehicle is advanced across the field, by virtue of the provision of an accumulator which receives the crop while the pile is being compressed, and from which accumulator the crop so accumulated is thereupon dumped onto the compressed pile by retraction of a shiftable section of the press roof.

22 Claims, 12 Drawing Figures



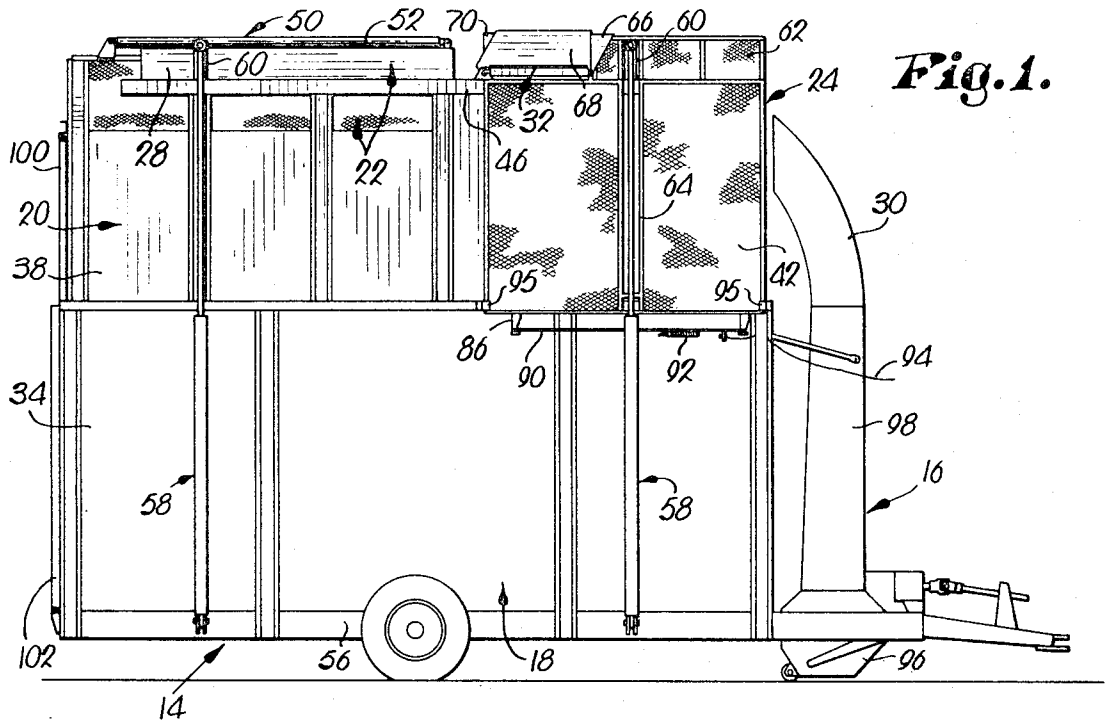


Fig.1.

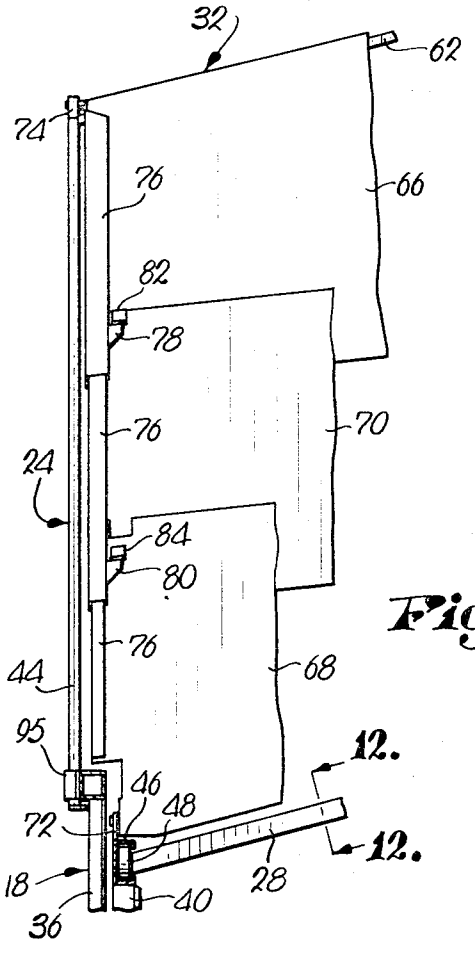


Fig.9.

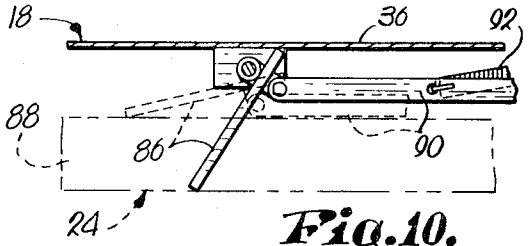


Fig.10.

Fig.11.

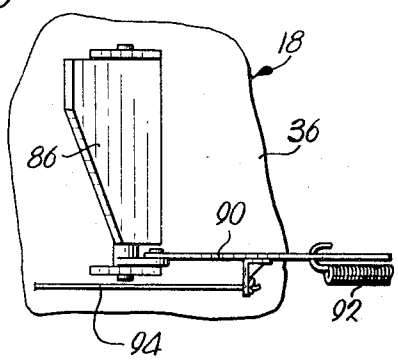
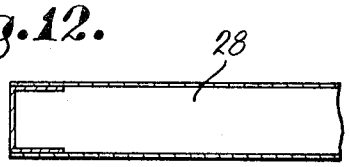


Fig.12.



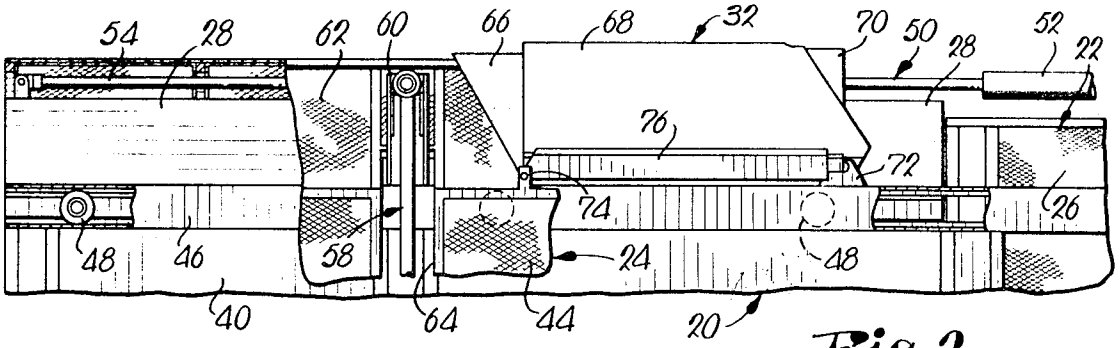

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Fig. 2.

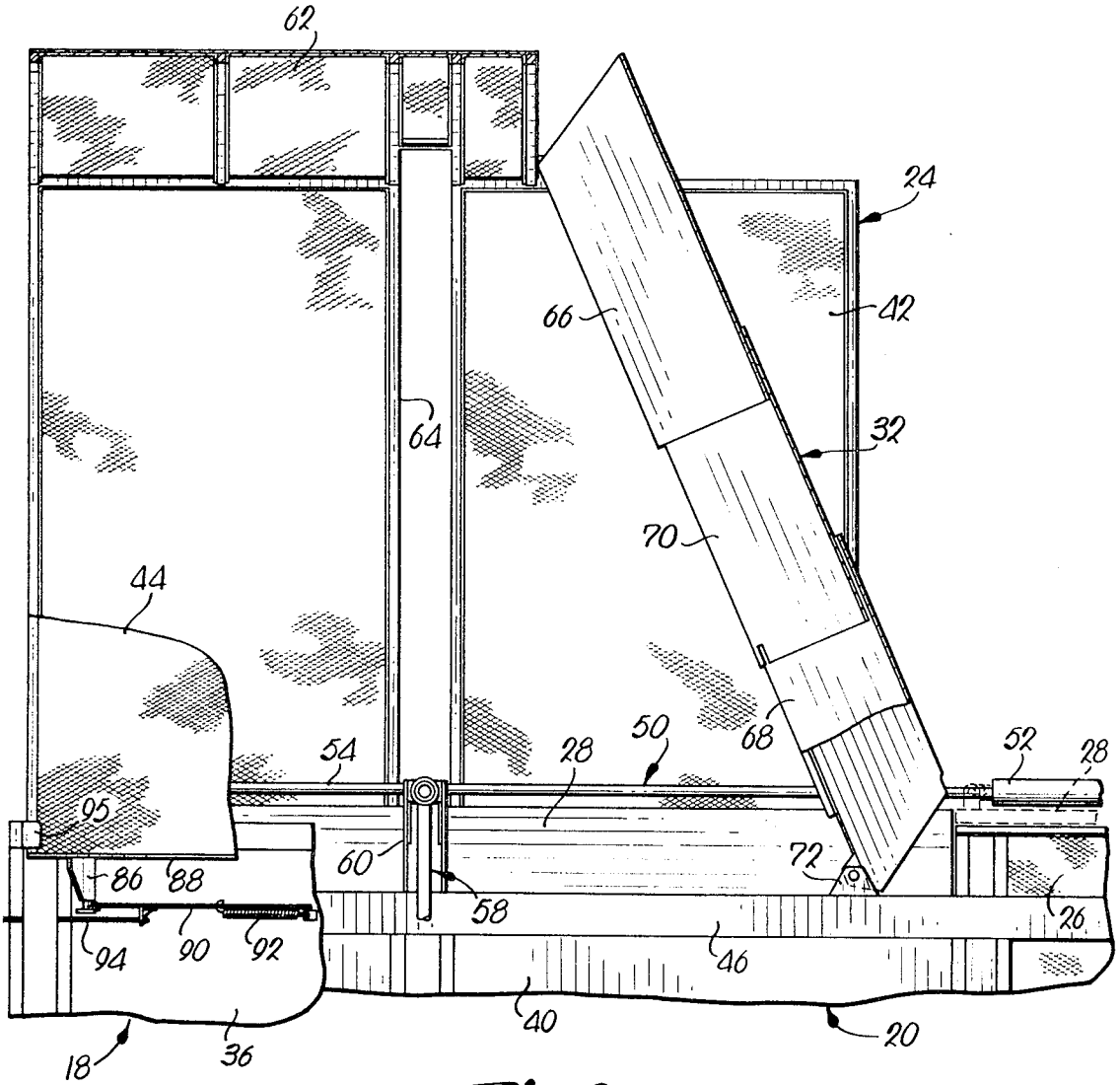

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Fig. 3.

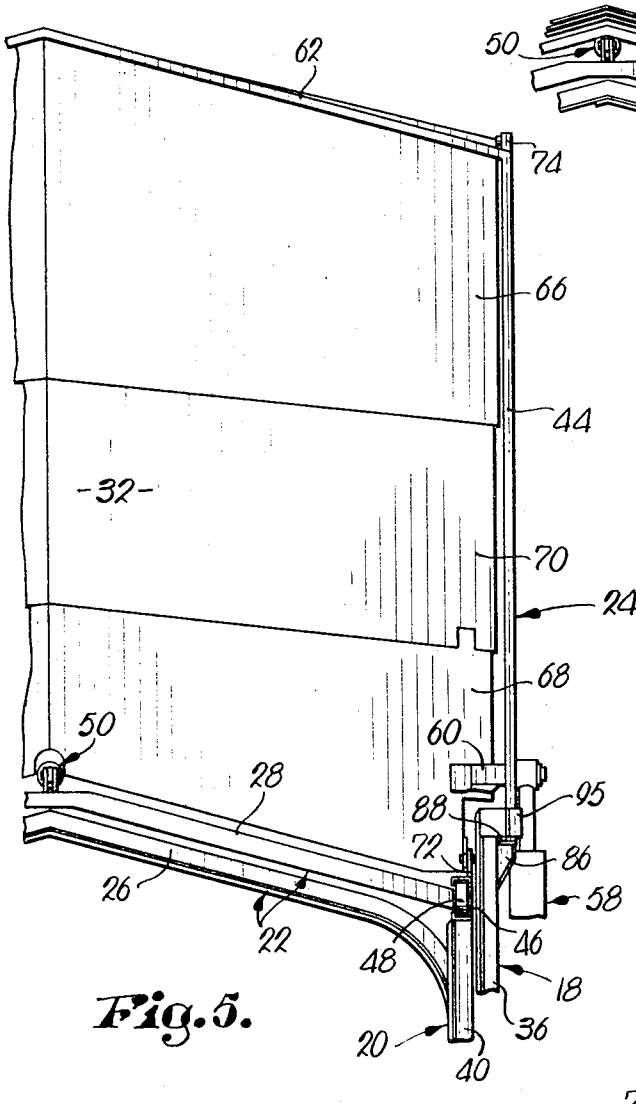


Fig.5.

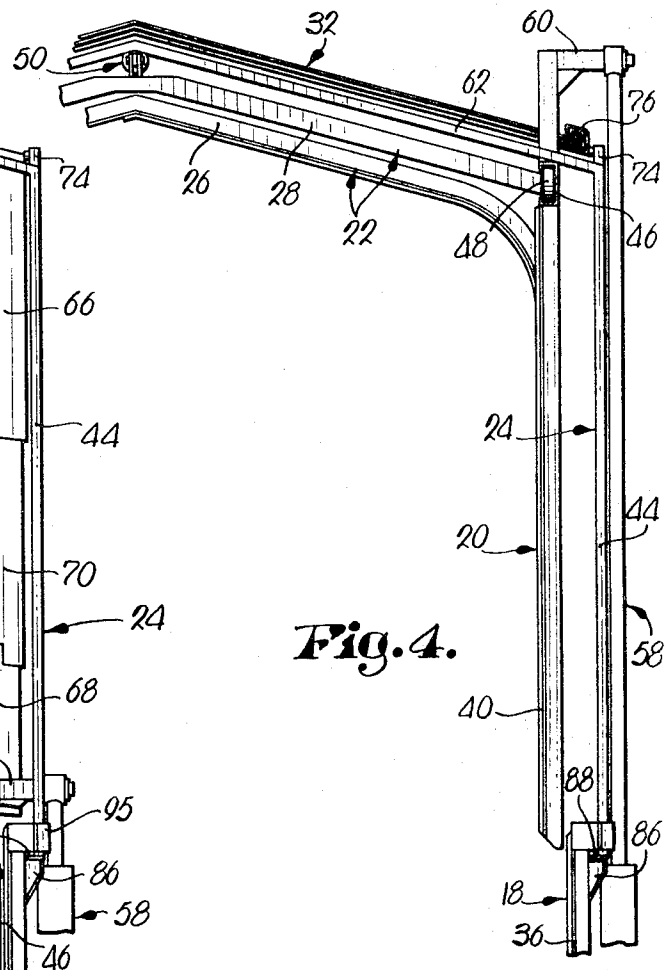


Fig.4.

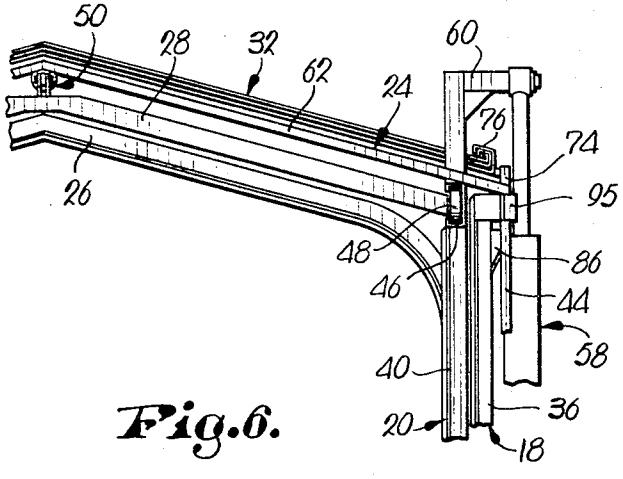


Fig.6.

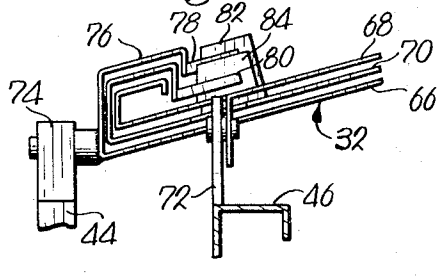


Fig.7.

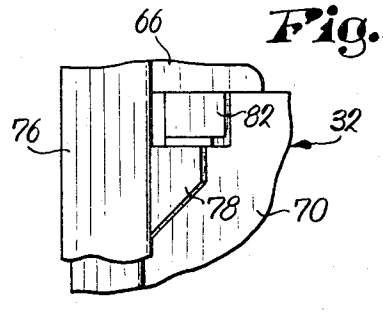


Fig.8.

PRESS FOR UNINTERRUPTED FILLING OF STACK FORMING WAGONS

This invention is related to co-pending applications Ser. No. 876,944 filed Nov. 14, 1969; Ser. No. 82,900 filed Oct. 22, 1970; and Ser. No. 139,391 filed May 3, 1971, and has an important object to improve upon the inventions disclosed in said applications and in my U.S. Letters Patent No. 3,556,327 issued Jan. 19, 1971, entitled "Loose Hay Wagon."

The most important object of the present invention is to provide, through use of a press roof having a retractable accumulator section and an extensible backstop, for periodic compression of a crop within a vehicle-supported, stack forming body without interrupting the flow of the crop as the vehicle travels across the field and continuously picks the crop off the ground.

Another important object of my present invention is to provide for crop accumulation upon one section of the press roof while pressing takes place such that the crop so accumulated may be easily and quickly discharged to the stack being formed in the body after each pressing operation by retraction of such roof section, and the feeding into the body thereupon continued without stopping or slowdown.

Still another important object of the instant invention is to provide a hollow accumulating structure whose bottom becomes part of the press, functioning both to compress the pile and receive the crop during the pressing operation, permitting continuous feeding, pressing and accumulation in a sequence which will not only compress each accumulation into the stack after its discharge, but properly compress additional collections into the stack after each such discharge.

A further object of the present invention is to provide a way to introduce a backstop into the sequence such as to prevent feeding of the crop into the body below the press roof during each pressing operation.

A still further object of my instant invention is to incorporate the accumulator bottom and the backstop into the press in such manner as to be actuated thereby and, therefore, as to be synchronized in proper sequence, substantially reducing operator work and attention.

In the drawings:

FIG. 1 is a side elevational view of a stack forming wagon embodying a press for uninterrupted feeding made in accordance with the present invention;

FIG. 2 is an enlarged, fragmentary view of the opposite side of the press, but showing its shiftable roof section within the accumulator structure, parts being broken away for clearness;

FIG. 3 is a fragmentary, essentially cross-sectional view, still further enlarged, similar to FIG. 2, taken vertically and longitudinally, but showing the press down and the backstop extended;

FIG. 4 is a fragmentary, transverse cross-sectional view looking rearwardly, showing the press up and the backstop contracted;

FIG. 5 is a view similar to FIG. 4 but showing the press down and the backstop extended;

FIG. 6 is a view similar to FIGS. 4 and 5 but showing the press down, the accumulator structure down and the backstop contracted;

FIG. 7 is a fragmentary, detailed cross-sectional view still further enlarged taken through one side edge of the backstop;

FIG. 8 is a fragmentary plan view of the details shown in FIG. 7;

FIG. 9 is a view similar to FIG. 5 but looking forwardly;

FIG. 10 is a fragmentary, horizontal, detailed cross-sectional view through a portion of that side wall of the stack forming body visible in FIG. 9 showing one of the latches for holding the accumulator structure elevated;

FIG. 11 is a fragmentary side elevational view of the side wall shown in FIGS. 9 and 10, illustrating said latch; and

FIG. 12 is a fragmentary cross-sectional view taken on line 12—12 of FIG. 9.

The stacking machine illustrated in the drawings includes a wheeled vehicle 14 which carries a crop feeder 16 at its forwardmost end and supports a hollow, open, top stack forming body 18 for receiving the crop from the feeder 16. A vertically reciprocable, open bottom press 20, carried by the body 18, has a crowned roof 22 for compacting the crop received by the body 18. A hollow structure 24 is also carried by the body 18 for accumulating the crop emanating from the feeder 16 during compaction. The roof 22 has a rear section 26 and a front section 28, the latter of which is shiftable horizontally to one position (FIG. 3) forming a bottom for the structure 24, disposed to receive the crop from the feeder 16 during compaction, and to another position (FIG. 1) overlying the section 26 for discharging the accumulated crop into the body 18 after compaction.

The crop emanating from a spout 30 of the feeder 16 is projected rearwardly with considerable force, and in the event that such type of feeder 16 is employed, a backstop 32 may be provided. The backstop 32 is contractible to its compact condition shown in FIGS. 1, 2, and 4 during ascent of the press 20, and extensible to its stretched out position shown in FIGS. 3, 5 and 9 during descent of the press 20 such that the backstop 32 is disposed to limit the extent of rearward movement of the crop emanating from the feeder 16 during compaction.

Side walls 34, 36; 38, 40; and 42,44 are provided for the body 18, the press 20 and the structure 24 respectively. The walls 38 and 40 of the press 20 reciprocate between the walls 34 and 36 of the body 18 and between the walls 42 and 44 of the structure 24. The walls 42 and 44 of the structure 24 normally extend upwardly beyond the corresponding walls 34 and 36 of the body 18 adjacent the spout 30 as shown in FIGS. 1 and 3. In effect then, the walls 42 and 44 constitute upward extensions of the walls 34 and 36 at one end of the latter. The rear section 26 of the roof 22 rigidly joins the side walls 38 and 40 of the press 20, and the front section 28 of the roof 22 overlies the rear section 26 (as shown in FIG. 1 and by dotted lines in FIG. 3) when the section 28 is in a position for discharging the accumulated crop from the structure 24 into the body 18.

Elongated tracks 46 rigid to the side walls 38 and 40 and extending longitudinally thereof along their uppermost edges receive rollers 48 on the front section 28 of the roof 22 for horizontal reciprocation of the section 28 upon actuation of a fluid pressure piston and cylinder assembly 50 interconnecting the sections 26 and 28 of the roof 22. Cylinder 52 of the assembly 50 joins with the rear end of the section 26 thereabove and at its peak, as best seen in FIG. 1, whereas piston rod 54

of the assembly **50** joins with the forwardmost end of the section **28** thereabove at its peak as seen in FIGS. **1, 2** and **4–6** and by dotted lines in FIG. **3.**

A chassis **56** of the vehicle **14** has a pair of spaced fluid pressure piston and cylinder units **58** connected thereto, extending upwardly along each of the sidewalls **34** and **36** respectively and connected with L-shaped bridges **60** that are rigid to the tracks **46** and extended outwardly over the upper edges of the walls **34** and **36.**

The structure **24** has a crowned top wall **62** joining its side walls **42** and **44** and extending forwardly from the upper, rear end of the backstop **32.** Top wall **62** serves to deflect the crop downwardly as it emanates from the spout **30** during lowering of the press **20** and also when the roof section **28** is retracted as in FIG. **1,** although the operator may, if desired, return the section **28** to its position beneath wall **62** after press **20** is raised. Vertical slots **64** in the side walls **42** and **44** extend upwardly into the top wall **62** for clearing the two forwardmost bridges **60** during actuation of the units **58** to reciprocate the press **20.**

The backstop **32** comprises a plurality of transversely V-shaped panels, including a panel **66** that is uppermost when the backstop **32** is extended and inclined as in FIGS. **3, 5** and **9,** a lowermost panel **68** and an intermediate panel **70** which is slidable relative to panels **66** and **68.** The lower corners of the panel **68** are pivotally connected to upstanding ears **72** on tracks **46** whereas the upper corners of the panel **66** are pivotally connected to upstanding ears **74** on the upper edges of the walls **42** and **44** adjacent the rearmost end of the top wall **62.**

The side edges of the panels **66, 68** and **70** are curled upwardly as shown best in FIG. **7** to present relatively telescoped, interlocking loops broadly designated **76** adapted to slide relatively during reciprocation of the press **20.** Lateral lugs **78** are provided on each of the loops **76** of the panel **66** and lateral lugs **80** are provided on each of the loops **76** of the panel **70.** Stops **82** on the panel **70** are engageable with the lugs **78** and stops **84** on the panel **68** are engageable with the lugs **80,** all as shown best in FIGS. **7–9.**

The structure **24** is held in its upper position shown in FIGS. **1** and **3** by a pair of latches **86** (FIGS. **1, 10** and **11**) swingably mounted on each of the side walls **34** and **36** of the body **18,** the latches **86** being releasable for lowering of the structure **24** to the position shown in FIG. **6.** The latches **86** normally underlie flanges **88** extending throughout the length of the lower edges of the walls **42** and **44.** Each pair of latches **86** is pivotally interconnected by a link **90** and each link **90** has a spring **92** for yieldably holding the latches **86** swung outwardly as shown by full lines in FIG. **10.** Cables **94** connected with the links **90** permit manual retraction, and therefore, release of the latches **86** from beneath the flanges **88** against the action of the springs **92** to the position shown by dotted lines in FIG. **10.**

Prior to release of latches **86** the structure **24** is raised slightly to take the weight of the structure **24** off the latches **86** by actuation of units **58** to raise the press **20.** This raises the tracks **46** into engagement with the top **62** to suspend the structure **24** from the press **20.** Hence, upon release of the latches **86,** lowering of the press **20** lowers the structure **24** for over-the-road travel. Brackets **95** on the side walls **34** and **36** overlap the side walls **42** and **44** to guide the latter in their vertically reciprocable movement. Manifestly, the backstop **32** contracts to a horizontal position between the rear roof section **26** and the top wall **62,** regardless of the position of the roof section **28,** during such lowering of the press **20** and the structure **24.**

OPERATION

The vehicle **14** may be self propelled or, as shown, in the nature of a tractor drawn trailer with the feeder **16** operating to receive windrowed crops as the vehicle **14** is continuously advanced across a field. The feeder **16** as illustrated is the same as disclosed in Ser. No. 82,900 aforementioned, but for the purposes of the present invention, may be of any desired type, e.g., the crop pickup and feeding assembly of U.S. Pat. No. 3,556,327 above referred to.

Suffice it to point out, therefore, that the feeder **16** has a vaned rotor within a housing **96** carried by the chassis **56,** capable, when driven from the power take-off of the tractor, of picking up the crop of the window and creating sufficient air movement to continuously project the crop upwardly through a conduit **98** and thence rearwardly from the spout **30** between the walls **38** and **40,** below the wall **62** and into the body **18.** The front ends of the press **20** and the structure **24** are fully open, but the press **20** may be provided with a smaller inlet to receive the crop from the spout **30.** Inasmuch as this operation may be the same as disclosed in said U.S. Pat. No. 3,556,327, showing an embodiment capable of functioning in this manner, said patent is incorporated herein by reference as need be, and made a part hereof for a full understanding of the present invention.

As in U.S. Pat. No. 3,556,327, the crop collected in the body **18** may be compressed from time to time therein to produce a compact stack of self-sustaining nature when subsequently unloaded from the body **18.** After a pile is collected, which may rise as high as the roof **22,** or nearly so, the operator causes actuation of the assembly **50** to place the front roof section **28** below the top wall **62,** without stopping the advancement of the vehicle **14** or the flow of the crop through the spout **30.**

He then causes units **58** to be actuated to lower the press **20,** brining the roof **22** into engagement with the crop collected in the body **18** and piled between the walls **38, 40** and the walls **42, 44.** As soon as roof section **28** drops below the spout **30,** the crop emanating from the latter accumulates on top of the roof section **28** and is blown between walls **42** and **44** toward the backstop **32,** the latter of which gradually unfolds as the press **20** descends.

After compaction is complete, the press **20** is again raised, and as the press **20** starts to rise the roof section **28** is returned to a position disposed above the roof section **26** as shown in FIG. **1,** causing the accumulation within the structure **24** to be discharged onto the compacted pile in the body **18.**

Thereupon, in a still continuous operation, the crop is again blown into the body **18** upon the compacted pile and upon the discharged accumulation because the backstop **32** will have become fully contracted out of the way of the incoming crop by the time the press **20** reaches the upper position shown in FIG. **1.** The compacting operation and refilling cycle may be repeated as often as desired or needed until a fully loaded, complete stack is formed in the body **18.**

The stack may then be either unloaded in the field or transported to any other desired location, whereupon tail gates **100** and **102** on press **20** and body **18** respectively are opened, as in the pending applications aforementioned, or otherwise, and the stack discharged from the rear open end of the body **18.** Here again, reference may be made to U.S. Pat. No. 3,556,327 for an understanding of one suitable way of carrying out the unloading operation which of itself, as in the case of pickup and loading operations, forms no part of the present invention.

The salient features are directed, therefore, to the accumulator structure **24** and its operative association with the press **20.** These features include the dual function of the roof section **28** of the press **20,** serving as a bottom for the structure **24** during pressing and at the same time, cooperating with the roof section **26** to compress the crop; the function of the backstop **32,** cooperating with the walls **40, 42** and **62** and with the section **28** to receive and contain the crop during compaction; the retractable nature of the section **28** to discharge the contents of the structure **24** into the body **18** after each pressing operation; the movement of the backstop **32** out of the way after each pressing operation; the manner in which operation of the press **20** actuates the backstop **32;** the releasability of the structure **24** for descent to a lowered position for over-the-road travel; the manner in which the press **20** raises and lowers the structure **24;** and the way in which the sections **26** and **28,** the top **62** and the backstop **32** are all arched and mated to give the compact stack a proper configuration.

Thus, the continuous operation above stressed is made possible by simply sectionalizing the roof **22,** mounting the walls **40, 42** and **62** on the body **18,** and connecting the backstop **32** between the press **20** and the side walls **40** and **42.** Delays incident to stopping in the field to carry out each pressing step are entirely eliminated. The particular type of slide panel backstop **32** above described is for illustrative purposes only. Any shiftable, collapsible, foldable or other construction may be used provided only that it is in proper position while the press **20** is being lowered and capable of permitting the press **20** to be raised after each pressing operation.

Having thus described the invention, what is claimed as new and desired to be secured by Letters Patent is:

1. In a stacking machine:

a hollow, open top stack forming body having a pair of side walls provided with upward extensions at one of their ends;

a vertically reciprocable, open bottom press carried by the body and provided with side walls within the body disposed along said side walls of the latter and between said extensions,

said press having a roof between its side walls; and

a continuous feeder for directing a crop into the body between said side walls of the press below the roof when the press is up, and for directing the crop between the extensions above the roof while the press is being lowered,

said roof having a section retractable to a position while the press is being raised for discharging into the body the crop accumulating thereon while the press is being lowered.

2. In a stacking machine as claimed in claim **1;** and a backstop interconnecting the press and the extensions and movable to a position during lowering of the press for limiting the crop emanating from the feeder to movement onto said section while the press is being lowered.

3. In a stacking machine as claimed in claim **2** wherein said backstop is collapsible as the press is raised.

4. A stacking machine as claimed in claim **1** wherein said extensions are shiftable vertically to a lowered position alongside said side walls of the body.

5. A stacking machine as claimed in claim **4;** and releasable means for holding said extensions elevated.

6. A stacking machine as claimed in claim **4,** said press having means for raising and lowering said extensions.

7. A stacking machine as claimed in claim **1;** and a top wall joining said extensions for downward deflection of the crop emanating from said feeder.

8. A stacking machine as claimed in claim **7** wherein said extensions and said top wall are shiftable vertically to a lowered position disposing the extensions alongside said side walls of the body.

9. A stacking machine as claimed in claim **8;** and releasable latch means for holding the extensions and the top wall elevated.

10. A stacking machine as claimed in claim **9,** said top wall being carried by the side walls of the press upon release of said latch means, rendering the press operable to raise and lower the extensions and the top wall.

11. In a stacking machine:

a crop feeder;

a hollow, open, top stack forming body for receiving the crop from said feeder;

a vertically reciprocable, open bottom press carried by the body and provided with a roof for compacting the crop received by said body; and

a hollow structure carried by the body for accumulating the crop emanating from the feeder during compaction,

said roof having a section shiftable to one position forming a bottom for said structure disposed to receive the crop from the feeder during compaction, and to another position for discharging the accumulated crop into the body after compaction.

12. A stacking machine as claimed in claim **11** wherein said body, said press and said structure are each provided with a pair of spaced side walls, the side walls of the press being reciprocable between the side walls of the body and between the side walls of said structure, the side walls of said structure normally extending upwardly beyond the corresponding side walls of the body adjacent said feeder.

13. A stacking machine as claimed in claim **12** wherein said roof has a rear section rigidly joining the side walls of the press, and wherein said shiftable section overlies the rear section when the shiftable section is in said position for discharging the accumulated crop.

14. A stacking machine as claimed in claim **11** wherein said press is provided with a pair of spaced side walls each having an elongated, longitudinally extending track, said shiftable section being carried by said tracks for horizontal reciprocation therealong.

15. A stacking machine as claimed in claim **14** wherein said roof has a rear section rigidly joining the side walls of the press, and wherein is provided means

interconnecting the sections for reciprocating the shiftable section.

16. A stacking machine as claimed in claim **11** wherein said press is provided with a pair of spaced side walls and wherein is provided means connected with said side walls for reciprocating the press.

17. A stacking machine as claimed in claim **11**, said structure having a backstop disposed to limit the extent of movement of the crop emanating from the feeder during compaction.

18. A stacking machine as claimed in claim **17** wherein said backstop is extensible during descent of the press and contractible during ascent of the press.

19. A stacking machine as claimed in claim **18** wherein said press and said structure are each provided with a pair of sidewalls, each side wall of the press having an elongated, longitudinally extending track, said shiftable section being carried by said tracks for horizontal reciprocation therealong, said backstop having one end thereof pivotally connected with said tracks and the opposite end thereof pivotally connected with said side walls of said structure.

20 A stacking machine as claimed in claim **19** wherein said backstop comprises a plurality of panels interposed between said pivotal connections thereof and including an intermediate panel slidable relative to the panels proximal thereto.

21. A stacking machine as claimed in claim **20** wherein said roof has a rear section rigidly joining the side walls of the press, wherein said side walls of said structure have a top wall rigidly interconnecting the same, and wherein said backstop is interposed between said rear section and said top wall.

22. A stacking machine as claimed in claim **21** wherein the backstop is disposed horizontally above the side walls of said structure when the backstop is contracted and disposed on an incline between the side walls of said structure when the backstop is extended.

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