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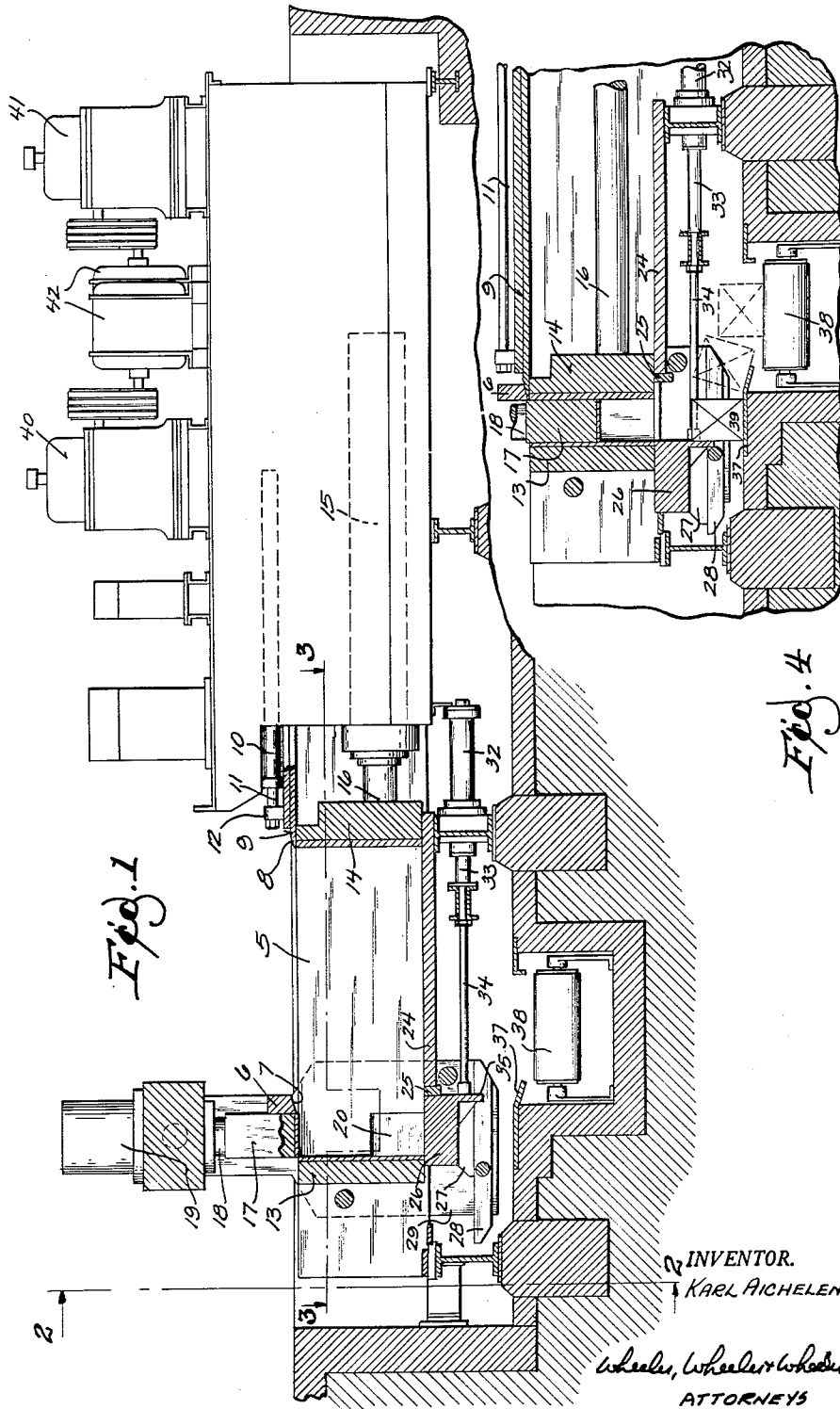
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SCRAP BALING PRESS WITH BOTTOM DISCHARGE

Filed July 28, 1955

2 Sheets-Sheet 1



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2 Sheets-Sheet 2

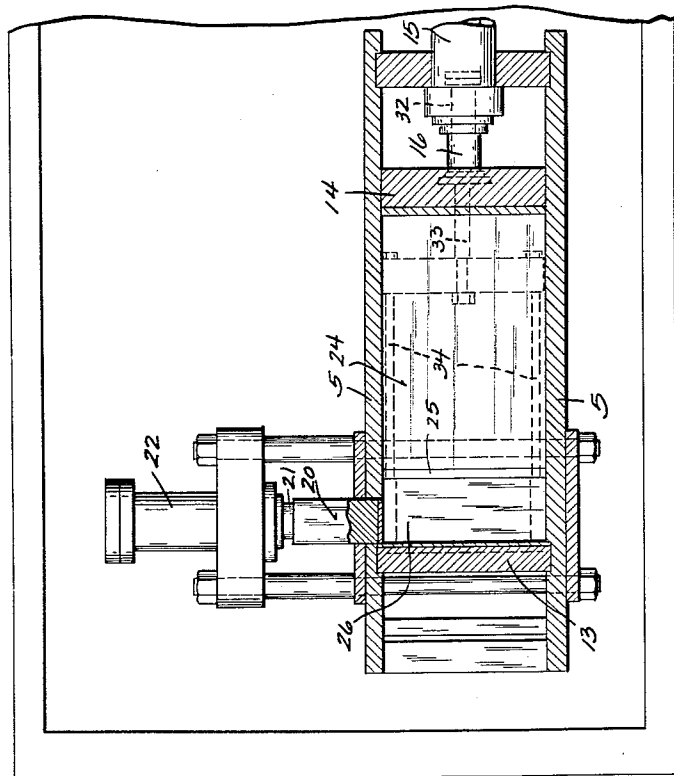


Fig. 3

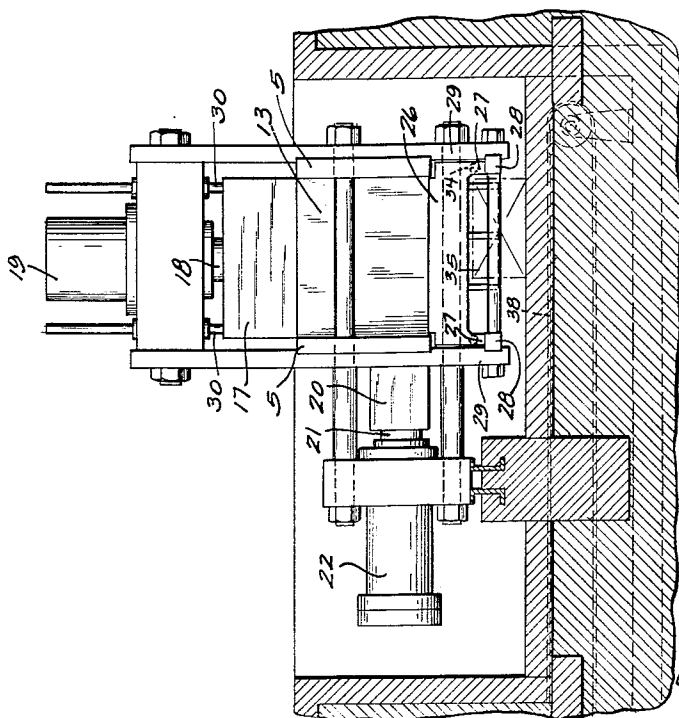


Fig. 2

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SCRAP BALING PRESS WITH BOTTOM DISCHARGE

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This invention relates to a scrap baling press with bottom discharge.

The present press bales scrap with rams acting in three directions but requires minimum excavation for its installation. The first compression desirably takes place longitudinally of the press box. In some installations, the second compression takes place vertically but in a downward rather than in an upward direction to force the baled scrap against an anvil in the bottom of the press box. In these installations, the third compression takes place horizontally in a lateral direction and the finished bale is then ejected by gravity by simply withdrawing the supporting anvil portion of the bottom of the box. Upon its return movement, the anvil may move the finished bale on to a discharge conveyor.

In other installations, the second ram moves horizontally and the third vertically downwardly. The sequence is, therefore, broadly immaterial. The description will be limited to the preferred embodiment with this understanding.

Those skilled in the art will recognize the fact that the described procedure and structure eliminates a dwell in the operation of the third ram cylinder which has heretofore been used quite extensively for ejection purposes after the bale has been completed.

In the drawings:

Fig. 1 is a view fragmentarily illustrating partially in section and partially in side elevation a baling press embodying the present invention.

Fig. 2 is an end elevational view of the press, the floor and walls of the installation pit and foundation pit being shown in section on the line 2—2 of Fig. 1.

Fig. 3 is a view taken in section on line 3—3 of Fig. 1.

Fig. 4 is a fragmentary detail view similar to Fig. 1 but showing the discharge of the bale.

The press box 5 is spanned near its compression end by a bridge member 6 with a lower surface beveled at 7 to receive the correspondingly beveled end 8 of the slidable cover 9. The cover is closed by a ram which includes a cylinder 10 and piston 11, the latter being directly engaged with an ear 12 projecting upwardly from the cover.

A heavy wall 13 closes the press box at its compression end. Slidable longitudinally of the box to and from the wall 13 is the head 14 of the first or low pressure ram that acts upon the scrap placed in the box. The cylinder of this ram is illustrated at 15 and the piston at 16. In normal operation, this ram will approach the end wall 13 sufficiently closely to be substantially flush with the far side of the bridge member 6.

Thereupon the second or intermediate ram will go into action. This ram operates downwardly. Its normally retracted head 17 is flush with the bottom of the bridge member 6 in its retracted position. Its actuating piston 18 and cylinder 19 are best shown in Fig. 2. The scrap, already compressed in the compression end of box 5, is pressed against anvil 26 with such force as to be reduced

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to less than half its height by the operation of the intermediate ram.

Upon conclusion of the operation of the intermediate ram, the high pressure ram operates. This ram has a head 20 normally retracted flush with the side of the box 5 as best shown in Fig. 3. From the retracted position there illustrated, the head 20 is advanced to the right by the movement of ram piston 21 outwardly from ram cylinder 22. The heads 14 and 17 of the low pressure and intermediate rams remaining in position, the advance of the high pressure ram head 20 reduces the bale to little more than half of its original length transversely of the press box.

Dimensions are given solely for purposes of illustration, and not by way of limitation. In commercial embodiments, the press box is 120 inches long, 60 inches wide and 48 inches deep. The low pressure ram head 14 approaches to within about 16 inches of the end wall 13 of the press box. The intermediate ram head 17 approaches to within about 20 inches of the anvil in the bottom of the press box. The high pressure ram at 20 approaches to within 36 inches of the far side of the press box. Thus the approximate dimension of the compressed bale of scrap is 16 inches by 36 inches by 20 inches.

The permanently installed bottom portion 24 of the press box terminates at a transverse member 25, beyond which, in the compression end of the press box, the bale is supported on a retractable anvil 26. The anvil is illustrated in full lines in Fig. 1 in the position which it occupies during the forming of the bale. The anvil has supporting flanges 27 which ride on ways provided at 28 by the downwardly extended side plates 29 which support an intermediate ram cylinder 19 and the guide pins 30 for the intermediate ram head 17.

From the normal position of the anvil 26 as shown in Fig. 1, the anvil may be moved to the position in which it is shown in Fig. 4 by means of a ram which includes a cylinder 32 and piston 33 and yoke comprising laterally spaced legs 34 shown in dotted lines in Fig. 3. An apron 35 depends from the front of anvil 26.

With the anvil in the retracted position indicated in Fig. 4, the bale formed in the press box as above described is allowed to drop by gravity from the press box between the yoke legs 34 onto a receiving plate 37 which overhangs a discharge conveyor 38 operating laterally beneath the press. With the bale on the plate in the position indicated at 39, the retraction of piston 33 in the cylinder 32 not only closes the bottom of the press box in readiness for another compressing operation, but discharges the bale onto the conveyor 38 which conveys it to any suitable delivery point. In dotted lines in Fig. 4, the bale is shown in successive positions en route to the conveyor.

It will be observed that no dwells or delays are required in the operation of the device. Just as soon as the bale is completed within the press box, all of the several rams are retracted to their starting points. The anvil simply moves forth and back to discharge the bale and while the conveyor carries the finished bale away, the box is being reloaded for another forming operation.

Only the fundamentals of the present invention have been described. It is immaterial to the present invention how the operation of the several rams is controlled and whether the controls are manual or hydraulic or electrical or fully automatic. The rams are, in accordance with the conventional practice, hydraulically powered through the pumps 40, 41 driven by motors 42. It is known in the art that the valves which connect the respective cylinders to, or relieve them of, the hydraulic pressure may be directly operated manually or may be controlled remotely by push buttons and solenoids. In the instant

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device, it is preferred that the control be fully automatic so that, the operation being initiated by the closing of the press box cover, each successive operation follows in series without further attention of the operator. This is easily done by the installation of pressure switches so that, as the pressure in a ram rises at the completion of each movement, a pressure switch is closed to initiate the next operation. The cover and anvil may be controlled by a single valve to close their respective press box openings concurrently and to open them concurrently.

I claim:

1. In a scrap baling press, the combination of a press box provided with a low pressure ram operable longitudinally thereof, an intermediate ram operable downwardly, and a high pressure ram operable laterally for the consolidation of scrap, said box having a compression end provided with a fixed bottom wall portion and with a retractable bottom wall portion in the path of the intermediate ram and constituting an anvil against which the scrap is compacted in the downward movement of said intermediate ram, means supporting the anvil for retracting and advancing movement transversely to the path of said intermediate ram, and means separate from said rams for actuating said anvil between advanced and retracted positions, whereby a bale of scrap compressed in said box is discharged by gravity upon the movement of said anvil to its retracted position.

2. The device of claim 1 in which the means supporting the anvil for movement between advanced and retracted position comprises generally horizontal ways generally parallel to the path of movement of the low pressure ram and along which said anvil is slidable from beneath a bale of scrap compressed in the compression end of said box, in further combination with a support for a bale of compressed scrap discharged by gravity from said box upon movement of said anvil to its retracted position, said anvil comprising means engageable in the

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course of the advancing movement of said anvil with a bale of compressed scrap on said support to displace such bale toward a point of discharge.

3. In a scrap baling press, the combination with a press box and a low pressure ram operable longitudinally thereof, said press box having a bottom underlying the path of movement of said low pressure ram and having a high pressure end provided with a retractable anvil constituting at least a portion of its bottom and extending substantially throughout the width of said box and toward which end said low pressure ram operates, an intermediate ram positioned above the box and arranged to operate downwardly toward said anvil for compacting scrap thereagainst, and a high pressure ram disposed laterally of the box and arranged to operate laterally to complete a bale over the anvil, and means separate from said rams for retracting the anvil from beneath the bale thus completed, whereby the bale is discharged by gravity from the bottom, a bale-ejecting conveyor mounted for operation beneath the box and offset from the point of bale discharge, the anvil having means for pushing onto said conveyor, in the return movement of the anvil, a bale discharged by gravity from the box.

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