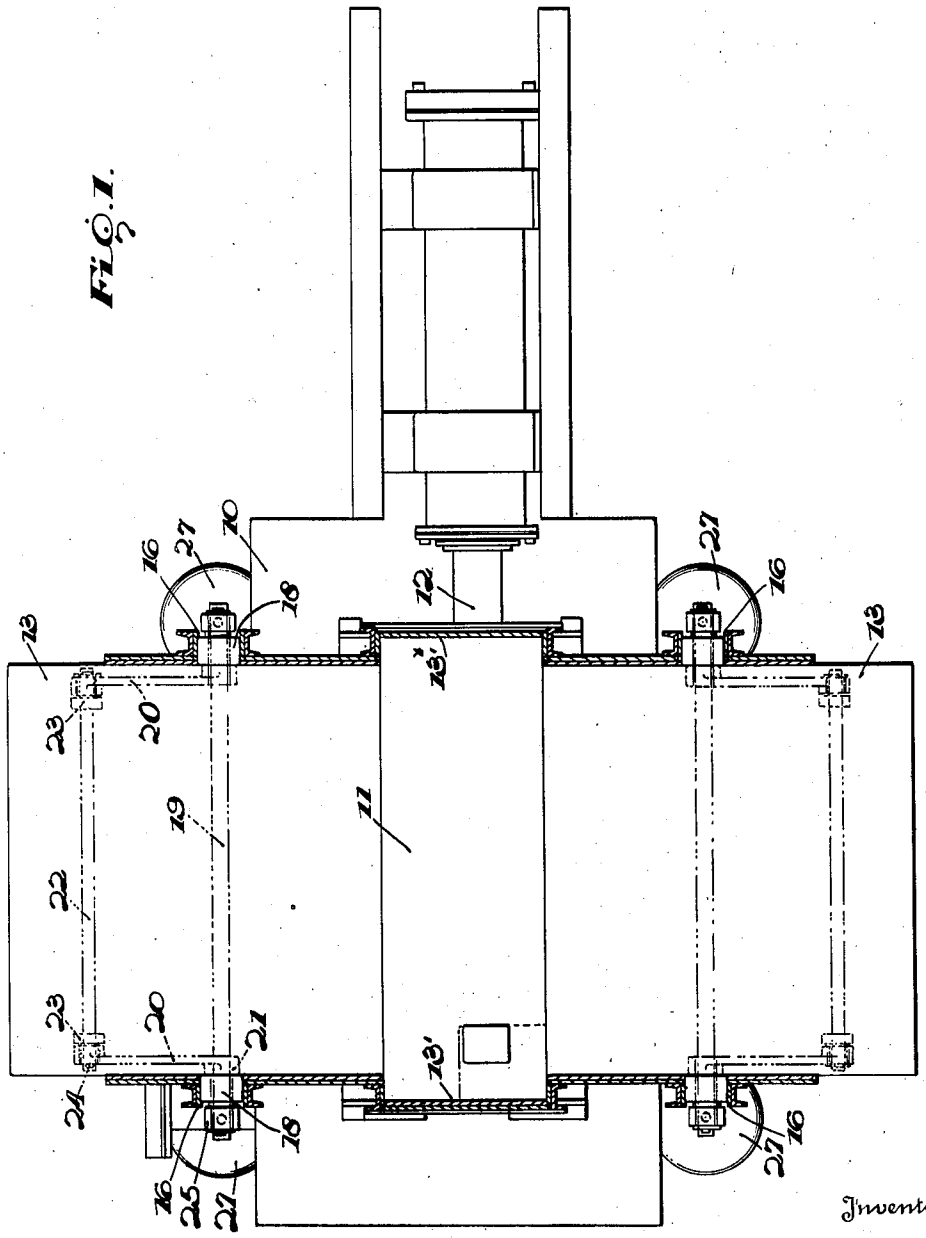
Dec. 14, 1943. W. A. PRYOR 2,336,637

PRESS

Filed Oct. 11, 1941 2 Sheets-Sheet 1

FIG. 1.



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PRESS

Filed Oct. 11, 1941 2 Sheets-Sheet 2

Fig. 2.

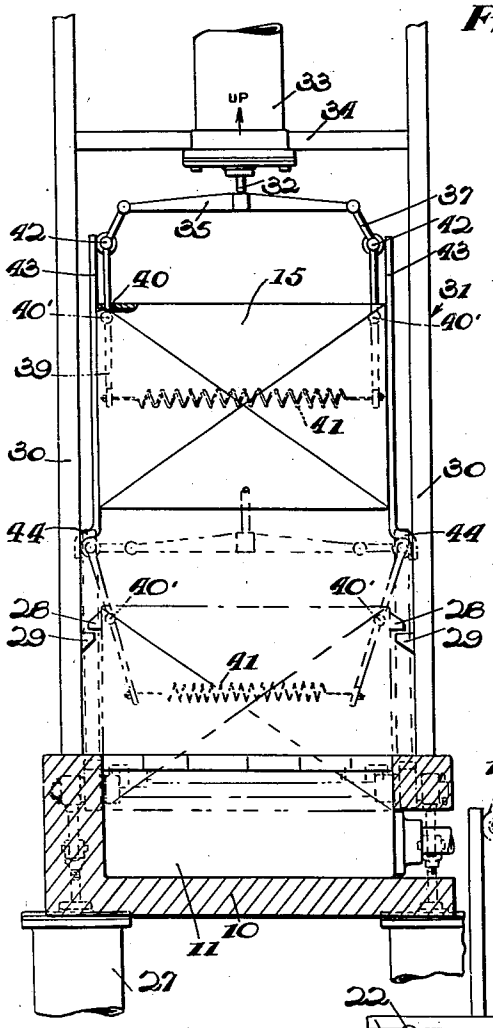


Fig. 3.

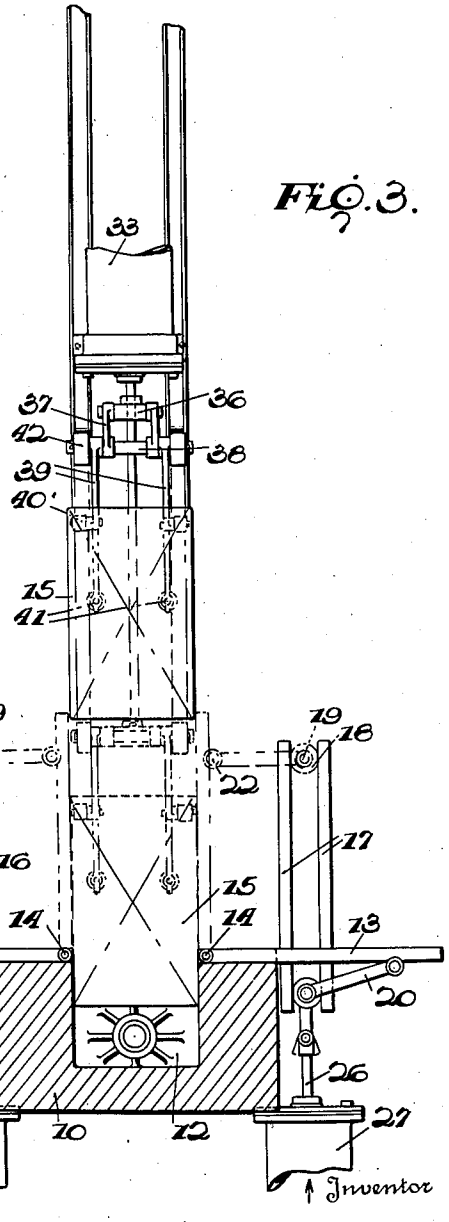
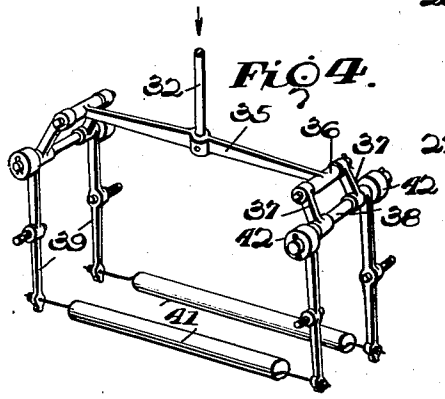


Fig. 4.



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PRESS

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Application October 11, 1941, Serial No. 414,668

19 Claims. (Cl. 78—42)

The present invention relates to presses, and more particularly to baling presses for briquetting scrap metal and other material.

An object of the present invention is to provide a baling press having a base or press box, a pair of opposed gatherer platens mounted on the press box to swing from a horizontal to a vertical position to confine scrap material between them, and a tramper platen located above the press box and adapted to be moved to and from the box between the gatherer platens to initially compress the material in the press box.

Another object is the provision of means for efficiently operating the gatherer platens and for locking these platens in their raised positions against movement caused by pressure exerted on the surfaces of the platens.

A further object is to provide stop means for limiting the downward movement of the tramper platen.

Another object is the provision of means associated with the operating means of the tramper platen, to lock said platen in its lowermost position against an upward thrust after it has engaged the stop means.

With the foregoing and other objects in view, the invention will now be more fully described, reference being had to the accompanying drawings in which:

Figure 1 is a top plan view partly in section of the press;

Figure 2 is a side elevation partly in section of the press;

Figure 3 is an end elevation partly in section of the press, and

Figure 4 is a detail of the linkage mechanism associated with the tramper platen.

Referring now to the drawings, the numeral 10 designates a base or press box provided with a substantially rectangular-shaped material-receiving opening or receptacle 11 having one end open to receive a compression ram 12. Upon opposite sides of the receptacle or opening 11 are located opposed gatherer platens 13. Each of these platens is pivoted at its inner end 14 adjacent one edge of the opening 11 and is capable of swinging from the horizontal full line position (see Figure 3) to the vertical dotted line position. A pair of end or scrub plates 13' cooperate with the gatherer platens 13 to form a box to retain the scrap material in position to be compressed. These gatherer platens and scrub plates also cooperate with a tramper platen 15, which is suspended above the press box, to initially compress the scrap material, as will be hereinafter described in greater detail.

Means are provided to raise and lower the gatherer platens 13 and to lock them in their raised position. This means includes pairs of tracks 16 substantially vertically mounted in any desired manner upon opposite sides of the base or press box 10. One track of each pair is positioned adjacent one end of the opening or receptacle 11 (see Figure 1) and comprises a pair of spaced vertically extending rails 17. A wheel or roller 18 is adapted to travel along each track between the rails 17, and this wheel is connected to its complementary wheel by means of a shaft 19 upon which the pair of wheels is journaled. A pair of links or toggle arms 20 connect the shaft 19 and wheels 18 to their respective gatherer platen 13. Each link 20 is provided at one end with a bearing surface 21 surrounding the shaft 19, while its other end is connected to a rod 22 mounted adjacent the outer end of its respective platen 13. The rod 22 is preferably fixed in brackets 23 mounted on the platen 13, while the outer ends of the links 20 are pivotally mounted on the ends of the rod and removably retained thereon, as by cotter pins 24 or other suitable fastener elements. If desired, the rod 22 may be journaled in the brackets 23, and the links 20 fixed to the rod.

Each shaft 19 extends outwardly beyond its pair of rollers 18, and is pivotally connected at each end to the upper end of a rod 25. Each rod 25 is suitably connected to a piston rod 26 operating in cylinder 27 which comprises the means for raising and lowering one of the gatherer platens 13. It is to be understood that air, hydraulic, or any other power means may be utilized to operate these platens and that this means may be located above, instead of below, the platens 13.

With the construction as thus described, it will be observed that as the pistons 26 operate to raise the wheels or rollers 18 along the tracks 16, this upward motion will be imparted to the links 20, and this will effect a movement of the platens 13 about their pivots 14. The platens will thus be raised from their horizontal positions to the vertical position shown in Figure 3 where their upper ends will slightly overlap the lower sides of the tramper platen 15. The arrangement is such that when the gatherer platens are in their vertical positions, the links or toggle arms 20 will be in a substantially horizontal position and will thus constitute a locking means for locking each gatherer platen in vertical position against

movement caused by pressure exerted on the surface of the platens. In other words, the straight line motion of each wheel or roller will be transformed into rotation of the platen and further provide a lock of the platen where normal pressure on the surface of the platen will exert pressure upon and normal to the track, but not parallel to the same.

Referring particularly to Figures 2 to 4, the means for actuating the tramper platen and for locking it in its lowermost position will now be described in detail. This platen is substantially rectangular in cross sectional formation and of a size to closely fit within the top of the press box or opening 11. Thus in its lowermost position (see Figure 3), the tramper platen will have preliminarily compressed the scrap material, and subsequently cooperates with the ram 12 to complete the baling or pressing operation. In order to insure that the lower end of the tramper always enters the opening 11 to the desired extent, means are provided to arrest or limit the downward movement of this platen. This means comprises sets of lugs 28 projecting outwardly from opposite ends of the platen 15 adjacent the top of the same. Cooperating with these lugs are sets of stops 29 which are mounted upon columns 30 constituting part of the framework of a tower 31. As will be observed (see Figure 2), the stops 29 are positioned directly in the path of the lugs 28 so that the latter will engage and rest upon the stops 29 when the platen has reached its lowermost position.

Any suitable means may be utilized for raising and lowering the tramper platen, and in the present instance, I have disclosed a piston 32 and cylinder 33 which is supported in the tower 31 and has its lower end connected to the cross rail 34. The lower end of the piston rod 32 is centrally secured to a cross bar 35. Complementary sets of toggle linkage mechanism are connected to opposite ends of the cross bar 35, and each set comprises a stub shaft 36 fixed to one end of the cross bar 35. A pair of upper links 37 have their upper ends pivoted to opposite ends of the stub shaft 36, while the lower ends of the links 37 are pivotally mounted upon an intermediate shaft 38. Exteriorly of the upper links 37 is located a pair of lower links 39, the upper ends of which are journaled on the shaft 38. These links 39 are pivotally secured intermediate their ends adjacent one end of the tramper platen 15. This platen is preferably fabricated of steel plates and is hollow throughout, at least, the greater portion of its area. The links 39, therefore, pass through openings or slots 40 in the top of the platen and are pivoted in bearings 40' located interiorly of the platen and mounted or fixed to opposite walls or sides thereof.

Each lower link 39 is extended below the pivot point or bearings 40' and is connected adjacent its lower end to one end of a spring 41, the other end of this spring being connected to one of the links 39 mounted at the other end of the tramper platen. The springs 41, therefore, are located within and extend substantially parallel to each other and to the side walls of the platen. They always tend to urge the upper ends of the links 39 outwardly. This is for the purpose of pressing or urging wheels or rollers 42 outwardly against rails 43. These rollers or wheels are four in number and are in sets of two, one roller of each set being journaled upon an end of one of the intermediate shafts 38. The rails 43, one for each roller or wheel, are secured to the framework 31 in any suitable manner, and each rail is fashioned at its lower end to provide an outwardly curved portion 44.

With this construction, and assuming that the tramper platen 15 is in its raised full line position, the latter is thus suspended from the piston rod 32 and cross bar 35 by means of the toggle linkage mechanism. In this position, the springs 41 are sufficiently strong to move the links 39 about their pivots and urge the wheels 42 outwardly into contact with their respective rails or tracks 43. Further assuming that the scrap material has been placed in the press box and that the gatherer platens have been raised to their vertical positions in overlapping relation to the lower portion of the tramper platen, downward movement of the piston rod 32 will, through the toggle linkage mechanism, lower the tramper platen and gradually compress the material into the opening or box 11. As the tramper platen descends, the links 37 and 39, and rollers 42 will remain in the full line position shown in Figure 2 until the platen reaches its lowermost position. The arrangement is such, however, that as the lugs 28 engage the stops 29, the rollers or wheels 42 will reach the outwardly curved portions 44 of the rails 43. The action of the springs 41, together with toggle action of links 37, due to pressure from cylinder 33, will thus urge the rollers outwardly into these curved portions, as clearly shown in dotted line position in Figure 2. In this position, the upper ends of the links 39 will be inclined outwardly, and the upper links 37 will be substantially in the same horizontal plane as the cross bar 35. This position of the links and rollers will prevent any movement of the platen initiated by an upward thrust upon the same and thus provide an effective lock to retain the platen in its lowermost position against any thrust or pressure exerted upon the platen from below the same. It is to be understood, of course, that after the ram 12 has further compressed the scrap material into a briquette, the tramper platen 15 may be readily raised to its uppermost position by the piston 32 and the cross bar 35. Any suitable means (not shown) may be employed to remove the compressed briquette from the press.

From the foregoing, it will be observed that the present invention provides an effective baling press for metal scrap or other material, and that the operating means for both the gatherer platens and the tramper platen have associated therewith means for effectively locking these platens against outward and upward movements respectively when they are in their operative positions.

It is to be understood that the invention is not limited to the details of construction shown in the drawings, and that the phraseology employed in the specification is for the purpose of description and not of limitation.

I claim:

1. In a press, a press box having a material receiving opening, a pair of opposed gatherer platens, each pivotally mounted upon one side of the opening to swing upwardly from a horizontal to a vertical position, a tramper platen suspended above the opening and vertically movable to and from said opening between the gatherer platens, a plurality of lugs carried by and projecting outwardly from said tramper platen, and a plurality of stops positioned above the press box in the path of said lugs and engageable

with the lugs to limit the downward movement of said tramper platen.

2. In a press, a press box having a material receiving opening, a pair of opposed gatherer platens, each pivotally mounted upon one side of the opening to swing upwardly from a horizontal to a vertical position, a tramper platen suspended above the opening and vertically movable to and from said opening between the gatherer platens, pairs of lugs, each mounted upon opposite ends of and adjacent the top of the tramper platen, and pairs of stops supported above the press box in the path of said lugs and engageable with the lugs to limit the downward movement of said tramper platen.

3. In a press, a press box having a material receiving opening, a pair of opposed gatherer platens, each pivotally mounted upon one side of the opening to swing upwardly from a horizontal to a vertical position, a tramper platen suspended above the opening and vertically movable to and from said opening between the gatherer platens, a plurality of lugs carried by and projecting outwardly from said tramper platen, a plurality of stops positioned above the press box in the path of said lugs and engageable with the lugs to limit the downward movement of said tramper platen, and means for locking said platen against upward thrust after the platen lugs have engaged the stops.

4. In a press, a base, a pair of opposed gatherer platens pivotally mounted on the base to swing from a horizontal to a vertical position, means for operating each gatherer platen and for locking it in vertical position against movement caused by pressure exerted on the surface of the platen, said means including a track, and toggle mechanism associated with the track and platen.

5. In a press, a base, a pair of opposed gatherer platens pivotally mounted on the base to swing from a horizontal to a vertical position, means for operating each gatherer platen and for locking it in vertical position against movement caused by pressure exerted on the surface of the platen, said means including a track, a wheel movable along the track, and a link having opposite ends pivotally connected to the wheel and platen whereby upon movement of the wheel along the track, the platen will be raised and lowered and in its raised position will be locked against movement because of the position of the link.

6. In a press, a base, a pair of opposed gatherer platens pivotally mounted on the base to swing from a horizontal to a vertical position, and means for operating each gatherer platen and for locking it in vertical position against movement caused by pressure exerted on the surface of the platen, said means including a substantially vertical track, a wheel movable along said track and a link having one end pivotally connected to the platen adjacent its outer free end, the other end of said link being pivotally connected to said wheel whereby upward movement of said wheel will actuate the link to raise the platen to vertical position and the link to horizontal position and thereby lock the platen in its raised position.

7. In a press, a press box, a pair of opposed gatherer platens pivotally mounted on the box to swing from a horizontal to a vertical position, a pair of substantially vertical tracks located on opposite sides of each platen, a pair of wheels, one movable over each track, a pair of links, each having one end pivotally connected to said platen and the other end pivotally connected to one of the wheels, and means for moving the wheels over the tracks to raise and lower the platen, said links in the raised position of the platen being horizontally positioned between the wheels and the platen and thereby locking the platen against movement caused by pressure exerted on the surface of the platen.

8. In a press, a press box, a pair of opposed gatherer platens pivotally mounted on the box to swing from a horizontal to a vertical position, a pair of substantially vertical tracks located on opposite sides of each platen, a pair of wheels, one movable over each track, a shaft upon which said wheels are rotatably mounted, a rod mounted on the platen adjacent its upper end, a pair of links, one end of each link connected to one end of the rod, the other end of each link being pivotally mounted on said shaft, and means connected to opposite ends of said shaft for moving the wheels over the tracks to raise and lower the platen, said links in the raised position of the platen being horizontally positioned between the wheels and the platen and thereby locking the platen against movement caused by pressure exerted on the surface of the platen.

9. In a press, a press box, a tramper platen associated with said press box and movable to and from operative position relative to said press box, substantially vertically disposed tracks upon opposite sides of said tramper platen, the lower end of each track being laterally offset from the rest of the track, operating means for raising and lowering said tramper platen relatively to said press box, and linkage mechanism connecting opposite sides of said tramper platen and said operating means and including wheels for said track, each wheel being urged against its track and in the lowermost position of the platen, engaging the offset portion of the track and cooperating therewith and with the rest of the linkage mechanism to lock the platen against an upward thrust upon the same.

10. In a press, a press box, a tramper platen associated with said press box and movable to and from operative position relative to said press box, substantially vertically disposed tracks upon opposite sides of said tramper platen, the lower end of each track being laterally offset from the rest of the track, operating means for raising and lowering said tramper platen relative to said press box, and linkage mechanism connecting opposite sides of said tramper platen and said operating means and including a cross bar positioned above the tramper platen, links pivotally connected to opposite ends of the cross bar, a second link pivotally connected to the end of each first link and also pivotally connected to the platen, a wheel connected to said links at their common pivot point and being urged against its track, each wheel in the lowermost position of the platen engaging the offset portion of its track and cooperating therewith and with the rest of the linkage mechanism to lock the platen against an upward thrust upon the platen.

11. In a press, a press box, a tramper platen associated with said press box and movable to and from operative position relative to said press box, substantially vertically disposed tracks upon opposite sides of said tramper platen, the lower end of each track being laterally offset from the rest of the track, operating means for raising and lowering said tramper platen relative to said

press box, and linkage mechanism connecting opposite sides of said tramper platen and said operating means and including a cross bar positioned above the tramper platen, links pivotally connected to opposite ends of the cross bar, a second link pivotally connected to the end of each first link and also pivotally connected to the platen, a wheel connected to said links at their common pivot point, each second link being extended downwardly beyond its pivotal connection to the tramper platen, and a spring connecting the said extensions and exerting pressure on said second links to urge the wheels against their respective tracks, each wheel in the lowermost position of the platen engaging the offset portion of its track and cooperating therewith and with the rest of the linkage mechanism to lock the platen against an upward thrust upon the platen.

12. In a press, a press box, a tramper platen associated with said press box and movable to and from operative position relative to said press box, substantially vertically disposed tracks upon opposite sides of said tramper platen, the lower end of each track being laterally offset from the rest of the track, operating means for raising and lowering said tramper platen relative to said press box, and linkage mechanism connecting opposite sides of said tramper platen and said operating means and including a cross bar positioned above the tramper platen, linkage mechanism connecting opposite ends of the cross bar to the platen and comprising pairs of links, the links of each pair having one end pivotally connected to an end of the cross bar, a shaft upon which the other ends of the links are pivoted, a second set of links pivoted on said shaft and also pivotally connected to one side of the platen, a pair of wheels mounted on said shaft and urged against the tracks, each wheel in the lowermost position of the platen engaging the offset portion of its track and cooperating therewith and with the rest of the linkage mechanism to lock the platen against an upward thrust upon the platen.

13. In a press, a compression chamber, a member movable to and from said compression chamber and having a wall adapted to engage the material to be pressed, longitudinally disposed tracks upon opposite sides of said member, the inner end of each track being laterally offset from the rest of the track, operating means for moving said member to and from said compression chamber, and linkage mechanism connecting opposite sides of said member and said operating means and including wheels for said track, each wheel being urged against its track and in the innermost position of said member, engaging the offset portion of the track and cooperating therewith and with the rest of the linkage mechanism to lock said member against outward pressure.

14. In a press, a compression chamber, a member slidable to and from said chamber and having a wall adapted to engage the material to be pressed, longitudinally disposed tracks upon opposite sides of said member, the inner end of each track being laterally offset from the rest of the track, operating means for moving said member to and from the compression chamber, and linkage mechanism connecting opposite sides of said member and said operating means and including a laterally extending element associated with said operating means, links pivotally connected to opposite sides of said element, a second link pivotally connected to the end of each first link and also pivotally connected to said member, a wheel connected to said links at their common pivot points and urged against its track, each wheel in the innermost position of said member engaging the offset portion of its track and cooperating therewith and with the rest of the linkage mechanism to lock the member against outward pressure.

15. In a press, a compression chamber, a ram reciprocal to and from said compression chamber and adapted to engage and press material in the direction of reciprocation of the ram, operating means for said ram connected thereto, and ram locking means operatively connected to said operating means and movable to a locking position at the inner end of the movement of the ram to lock said ram against outward pressure in the direction of reciprocation of the ram.

16. In a press, a compression chamber, a ram movable to and from said compression chamber and adapted to engage the material to be compressed, and operating means for said ram connected thereto, said operating means including an element movable transversely to the direction of movement of the ram and operable at the inner end of the movement of the ram to lock the ram against outward pressure in the direction of travel of said ram.

17. In a press, a compression chamber, a ram reciprocal to and from said compression chamber and adapted to engage and press material in the direction of reciprocation of the ram, fluid pressure operating means for moving said ram to and from the compression chamber, and mechanical means connecting the fluid pressure operating means to said ram, said mechanical means including an element operable at the inner end of the movement of the ram to lock said ram against outward pressure in the direction of reciprocation of the ram notwithstanding failure of said fluid pressure operating means to exert inward pressure on said ram.

18. In a press, a compression chamber, a ram slidable to and from said compression chamber and adapted to engage the material to be compressed, fluid pressure operating means for moving said ram to and from the compression chamber, and linkage mechanism connecting said fluid pressure operating means to said ram, said linkage mechanism including an element movable transversely to the direction of movement of the ram and operable at the inner end of the movement of the ram to lock said ram against outward pressure in the direction of travel of said ram notwithstanding failure of said fluid pressure operating means to exert inward pressure on said ram.

19. In a press, a compression chamber, a member movable to and from said compression chamber and having a wall adapted to engage the material to be pressed, operating means for moving said member to and from said compression chamber, linkage mechanism connecting opposite sides of said member and said operating means and including outwardly urged elements, and means engageable with said elements and in the innermost position of said member cooperating with said elements to lock said member against outward pressure.

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