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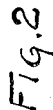
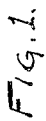
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PRESS

Filed Nov. 16, 1925

11 Sheets-Sheet 1



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Nov. 3, 1931.

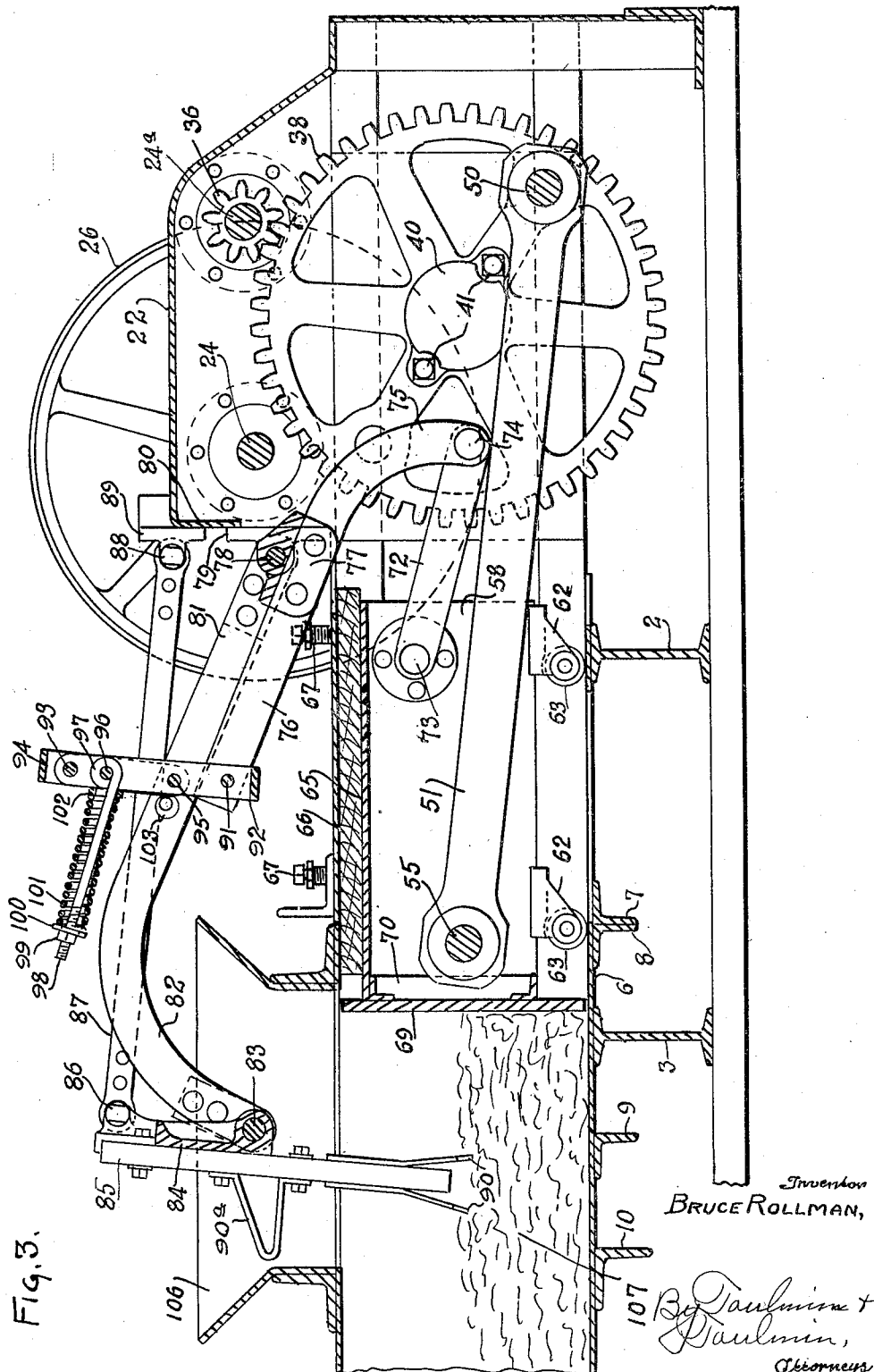
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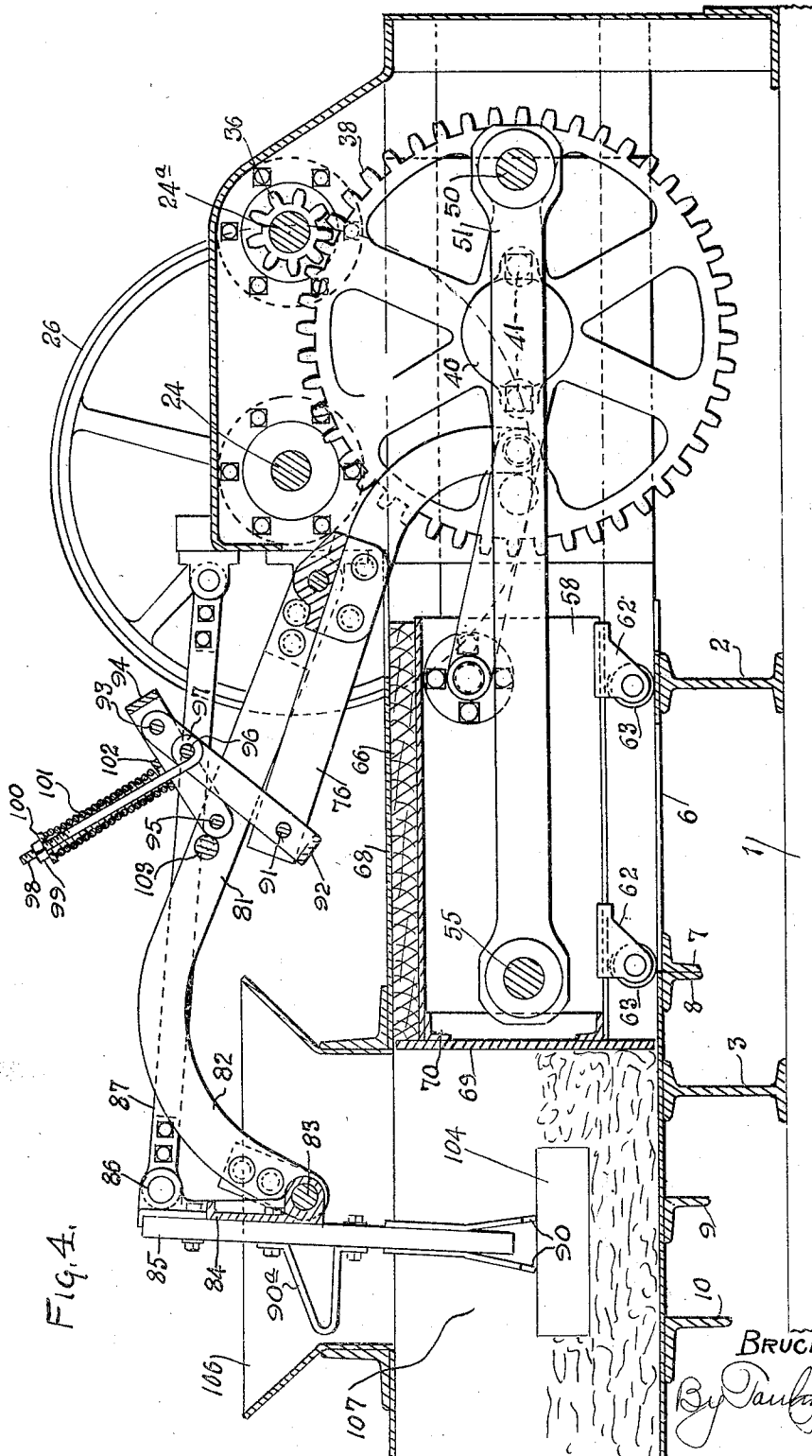
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11 Sheets-Sheet 3



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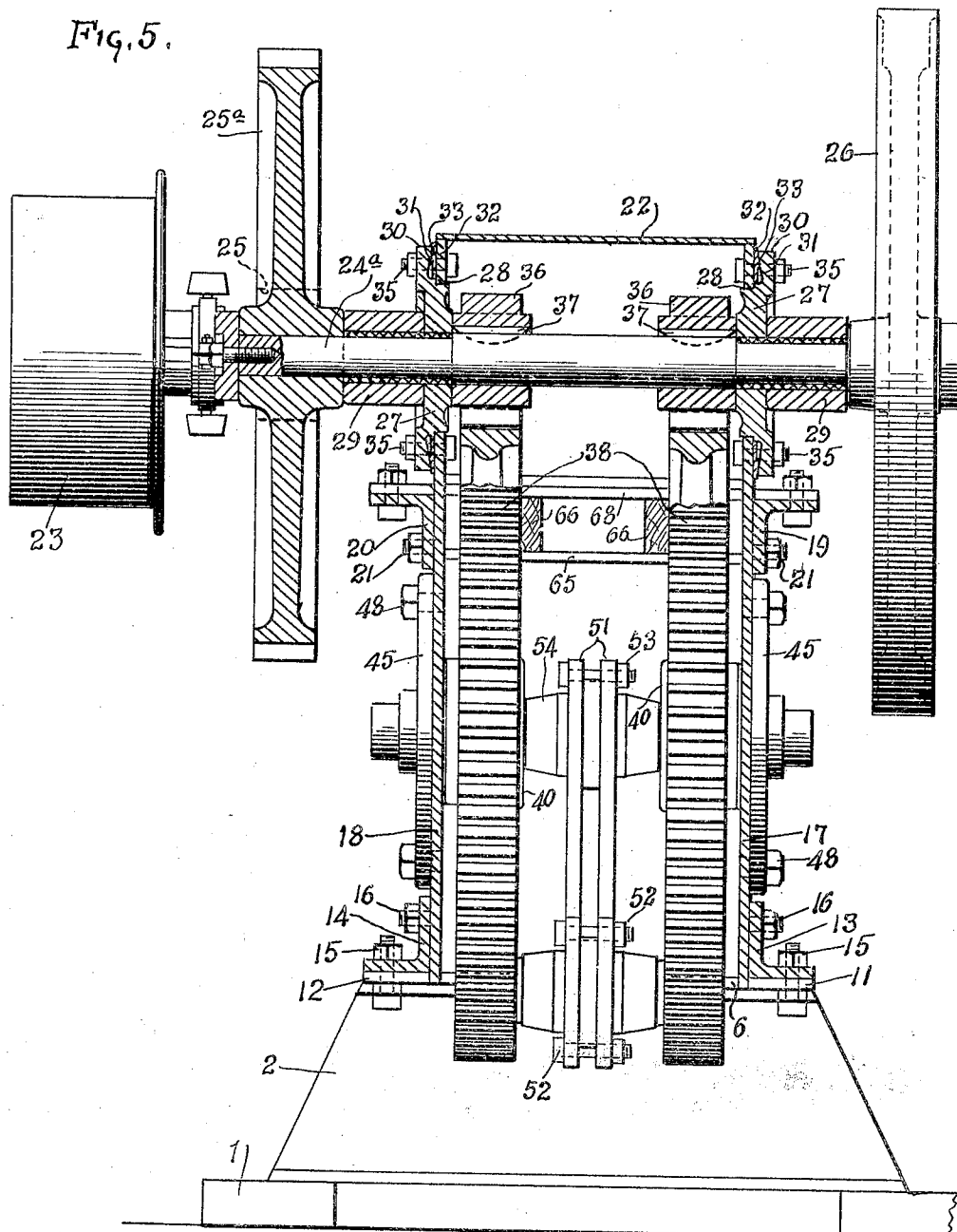
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Fig. 5.



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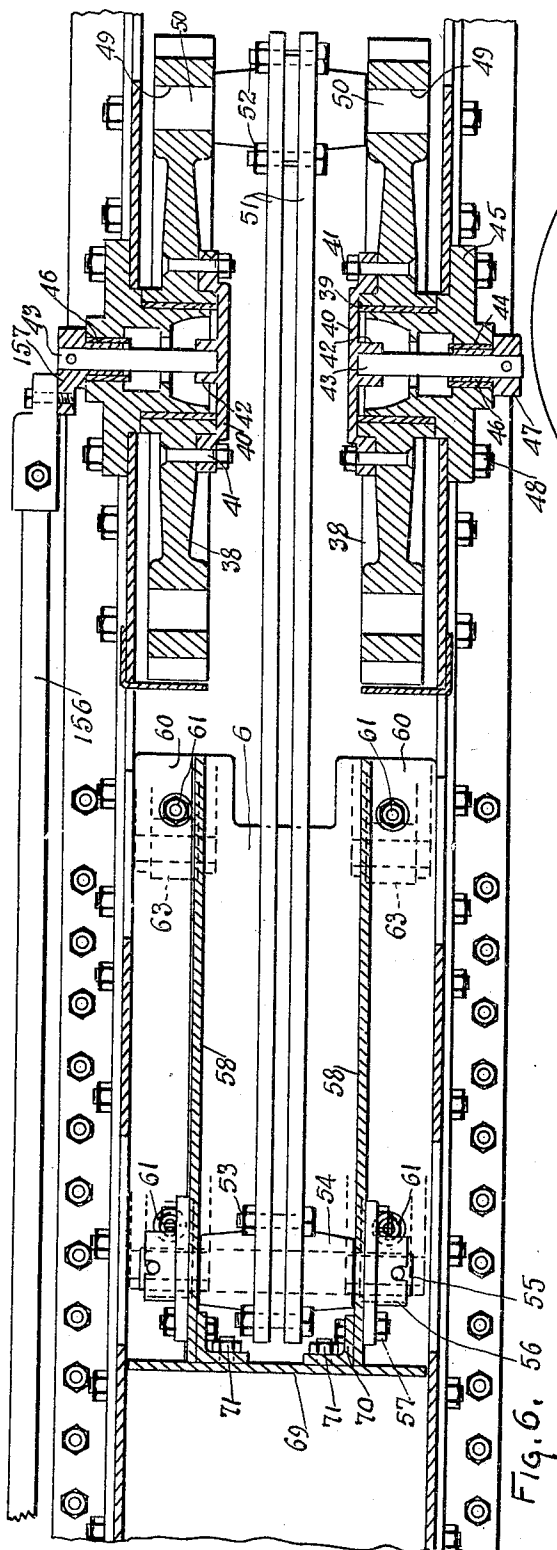


Fig. 6.

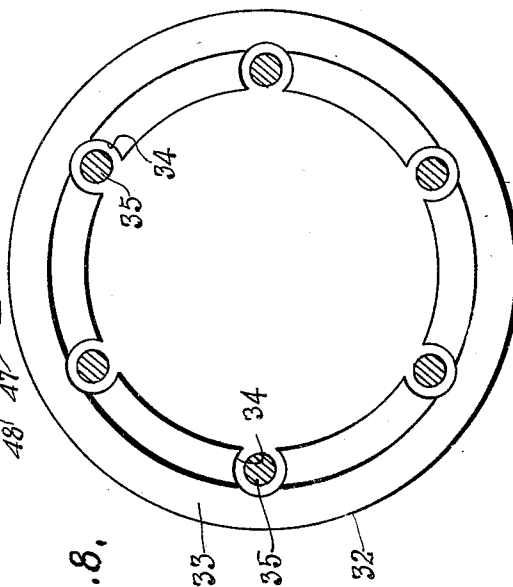


Fig. 8.

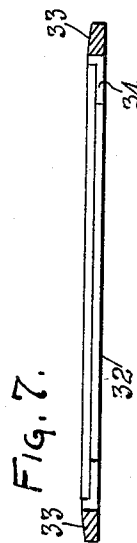


Fig. 7.

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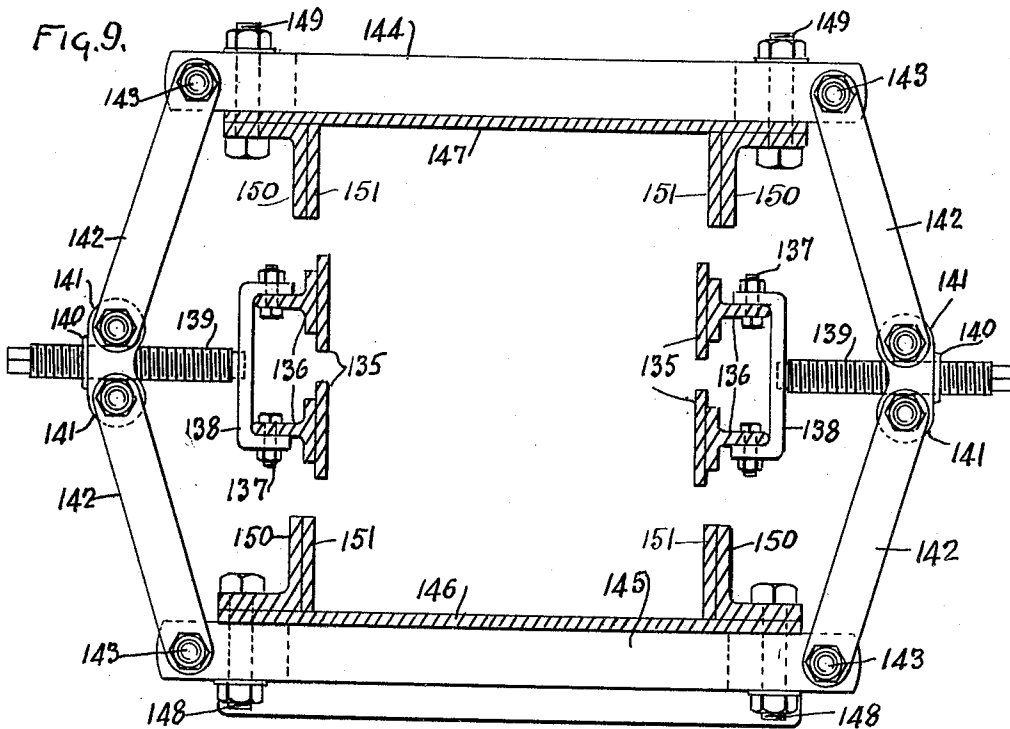
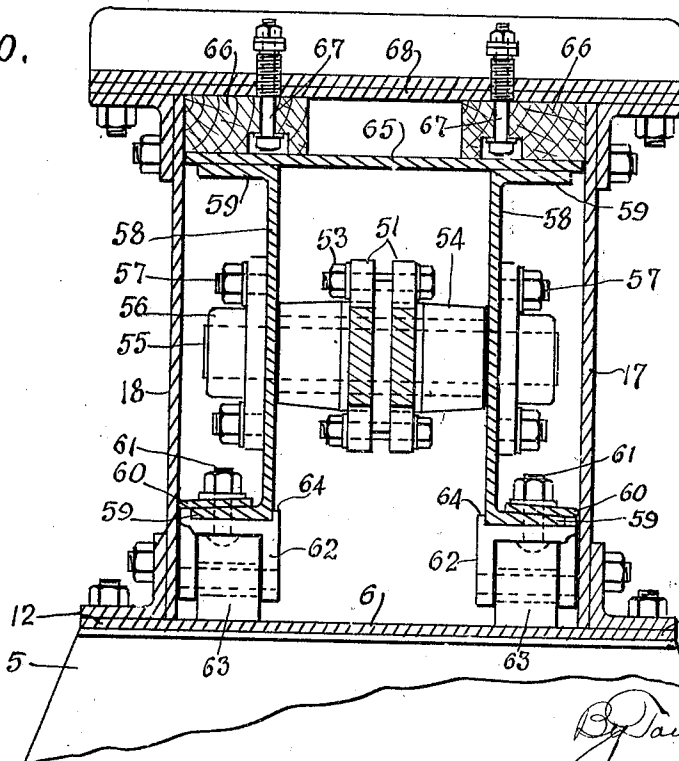


Fig. 10.



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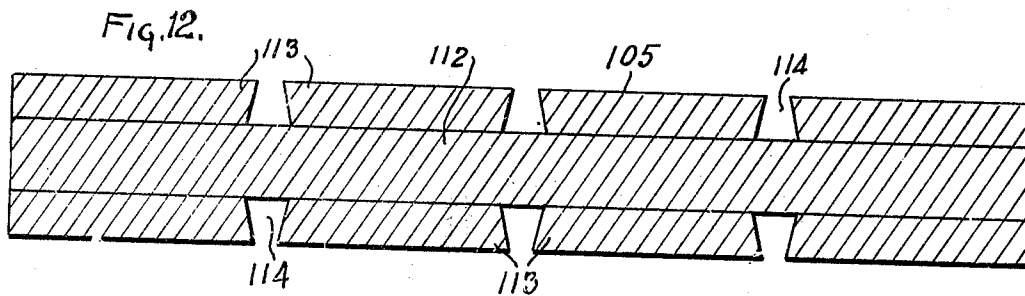
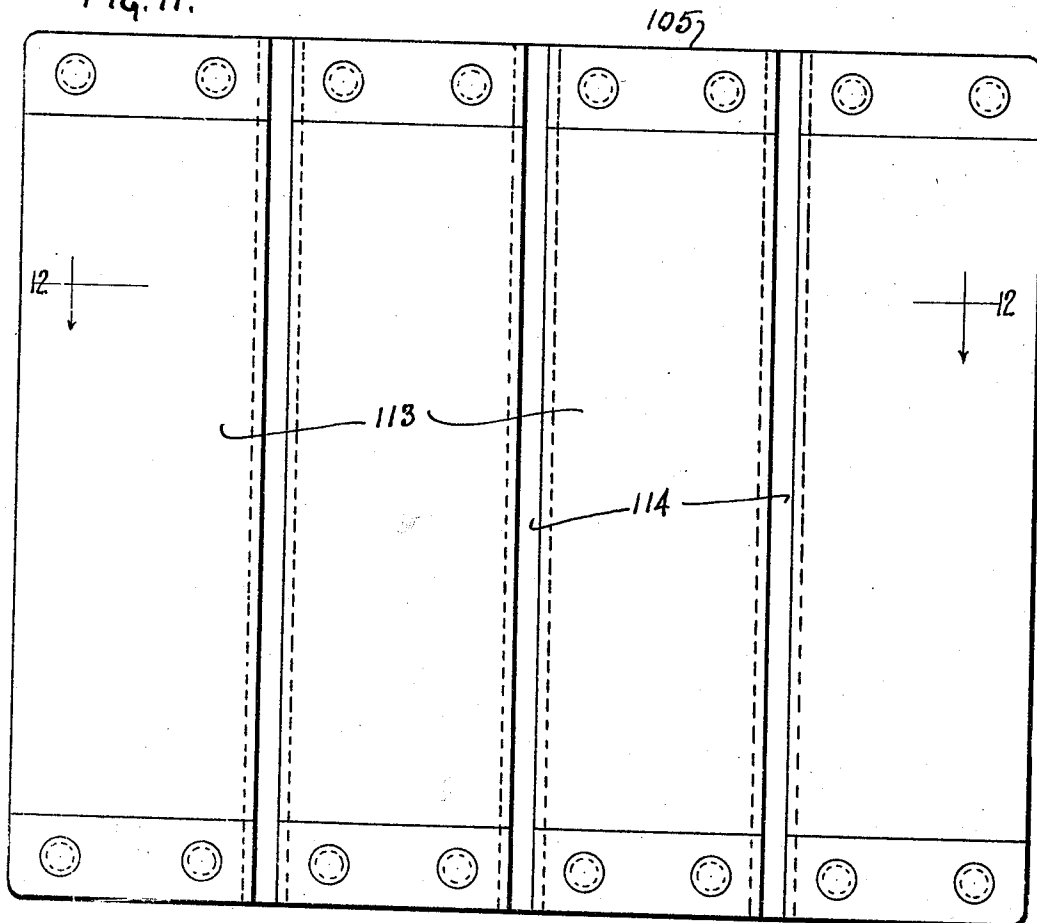
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Fig. 11.



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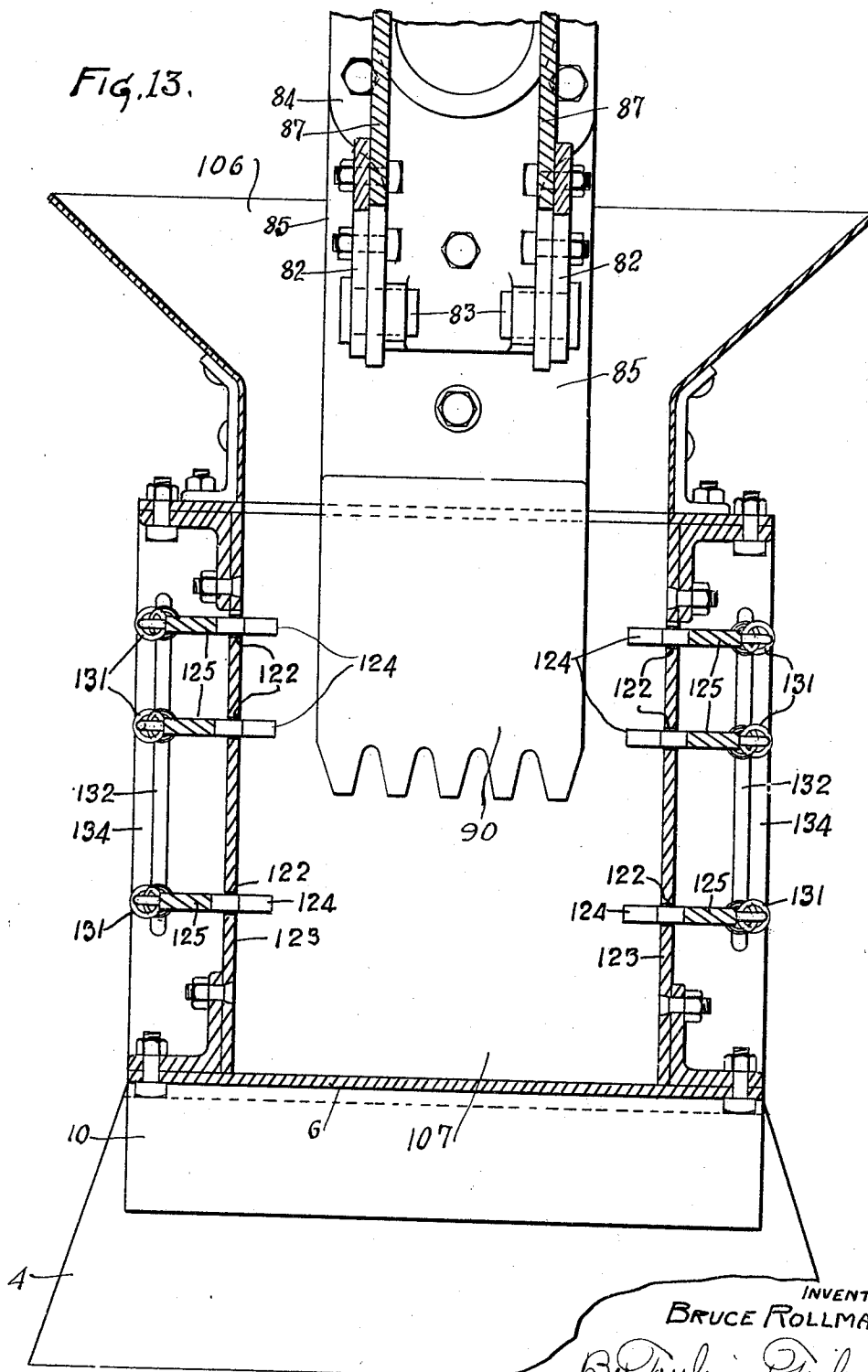
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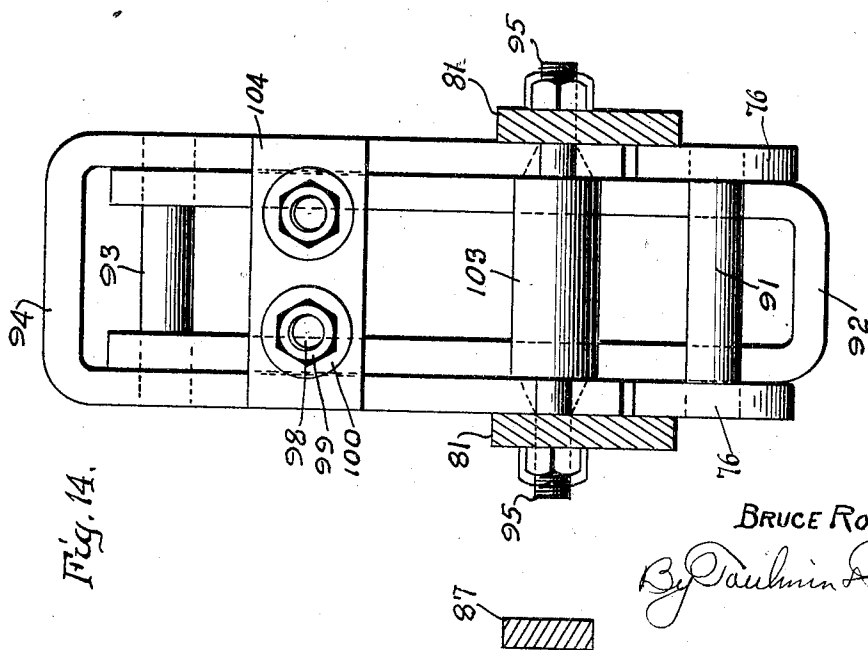
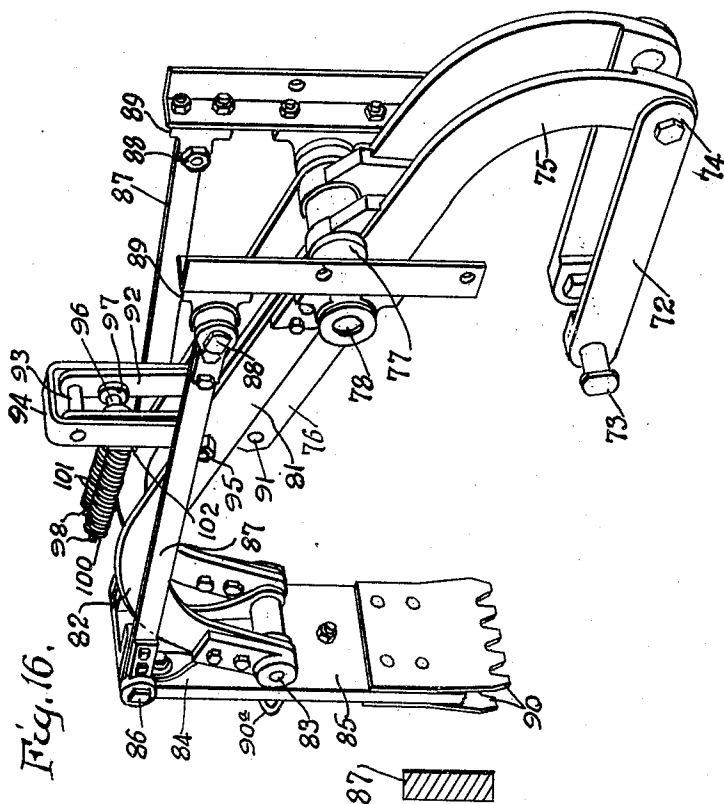
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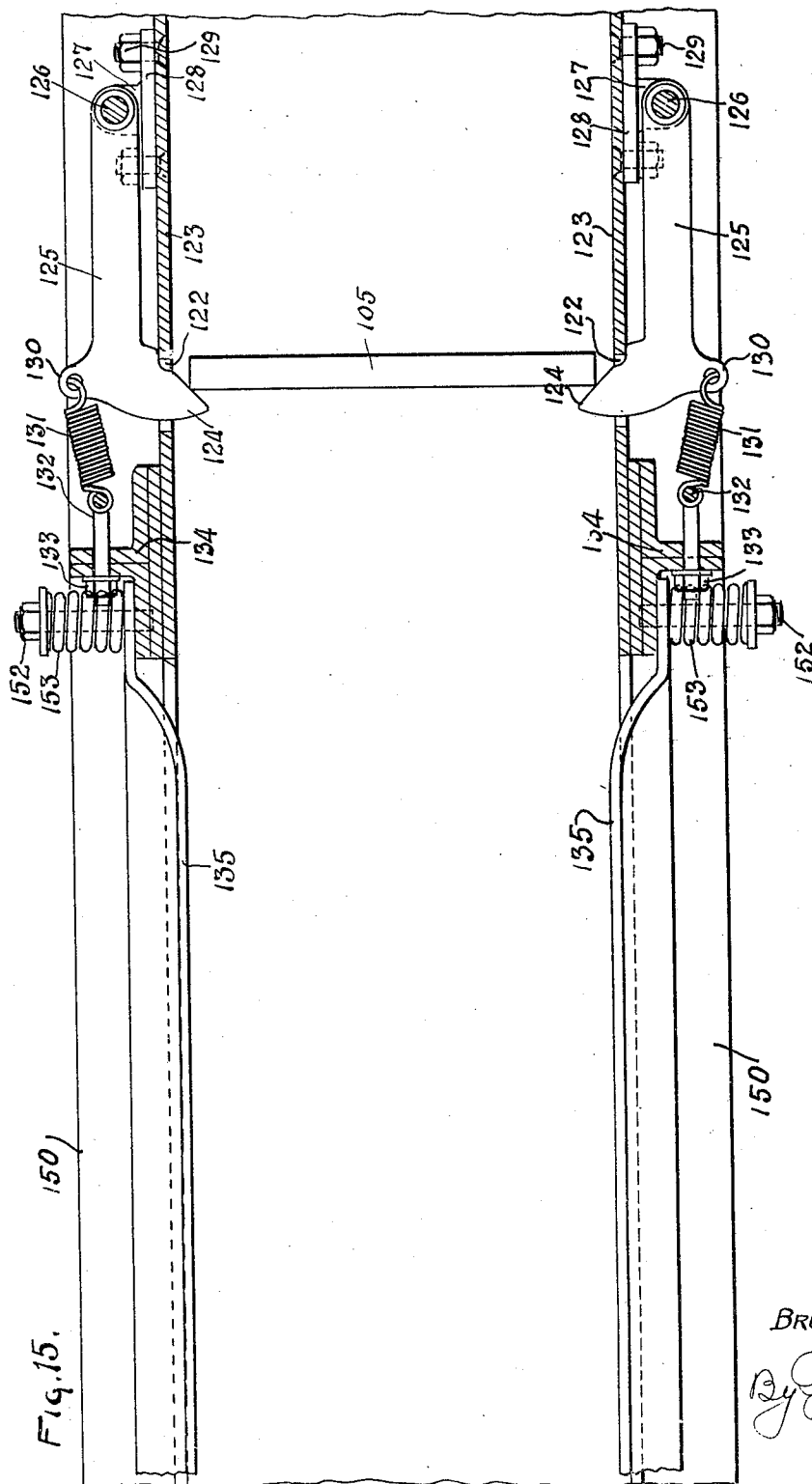
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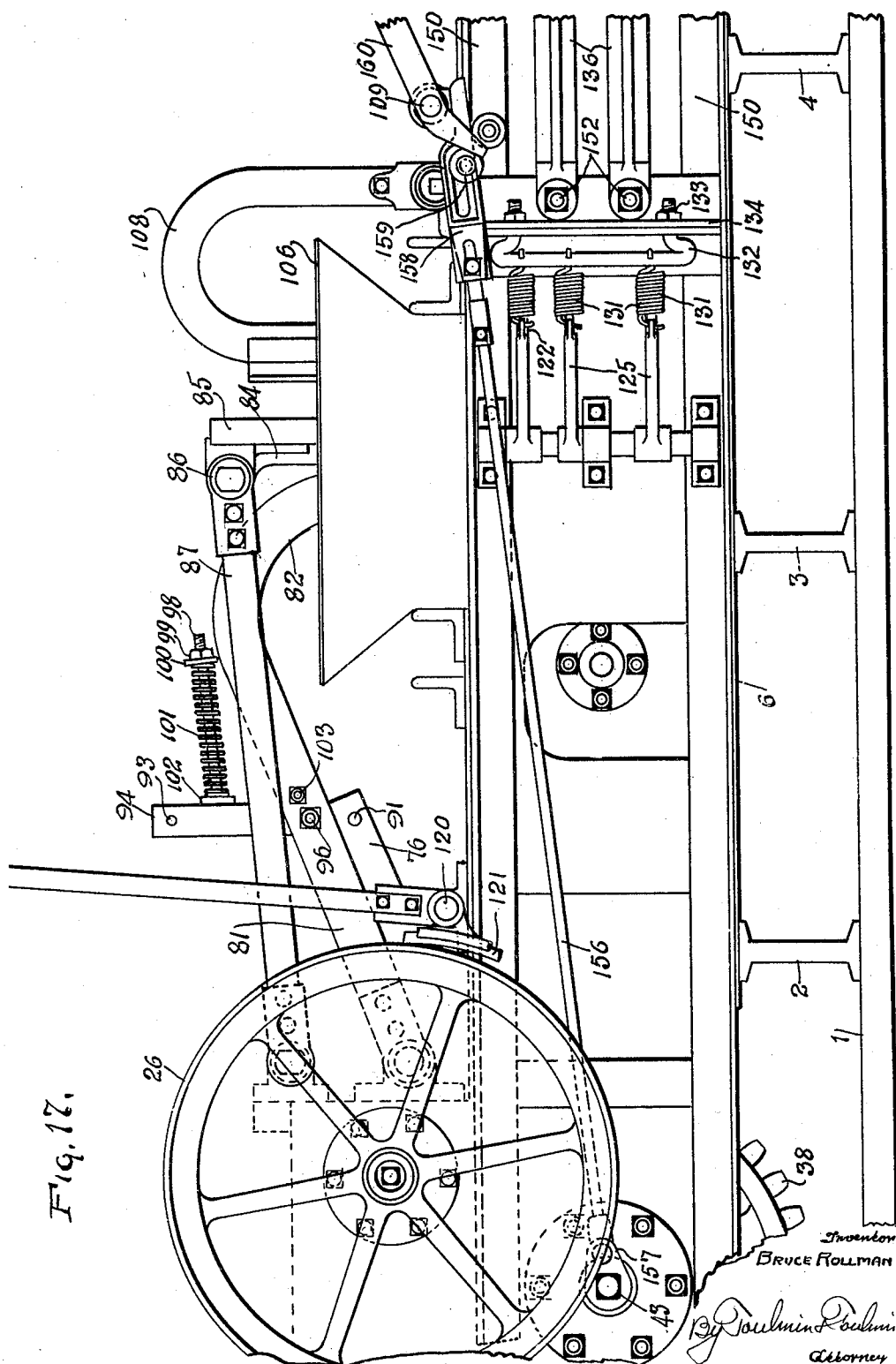
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UNITED STATES PATENT OFFICE

BRUCE ROLLMAN, OF BELLEVUE, OHIO, ASSIGNOR TO THE OHIO CULTIVATOR COMPANY, OF BELLEVUE, OHIO, A CORPORATION OF OHIO

PRESS

Application filed November 16, 1925. Serial No. 69,392.

My invention relates to presses and in particular to a press for the baling of paper or other finely divided and fragmentary material.

It is the object of my invention to provide a press of this character which will rapidly bale the material in question, which may be readily assembled and which will have suitable safety devices to insure continuous operation without breakage in the event foreign material is introduced in the press inadvertently.

It is my object to provide a press so arranged that the feeding board will be maintained substantially vertical during its descent into and its ascent from the baling chamber to prevent the withdrawal of material from the chamber which has been fed into it.

It is my object to provide means for this purpose for preserving the feeding board in nearly a vertical position from the connecting bars between the upper end of the feeding board and fixed points on the general frame where the other ends of the connecting bars are pivoted.

It is my object to provide such an arrangement so that the distance between the pivots of the connecting bars and the pivots of the feeding arms is greater at the end near the feeding board than the distance between the pivots of the connecting arms and the feeding arms at the other end of the bars and arms.

It is a further object to provide means for releasing the feeding board from further movement whenever the board is obstructed in the act of feeding as by some solid object found in the paper or other material that is being fed into the baling chamber.

It is my object to provide such a safety mechanism which is novel in that, although the safety springs increase in compression as the power is continued to be applied, still the leverage over the springs increases at a greater ratio than the compression increases, which results in relieving the feeding board from any increased pressure against the obstruction although the coil springs are undergoing further compression.

My safety device is so arranged that this increased pressure on the feeding board is prevented even though the press continues to operate during the time that the obstruction is in an obstructing position.

It is a further object to provide means in a bearing mechanism for maintaining the driving and driven shafts in suitable alignment and for aligning them easily when the machine is assembled, which greatly reduces the necessity for careful manufacture and the expense thereof.

It is an additional object to provide a novel feature of construction of the frame in that side plates extend from the bottom of the machine above the upper rail where they are used as supports for the bearings of the shafts, both for the driving shafts and the driven shafts.

It is an additional object of my invention to provide a novel form of retainer dogs for retaining the division block, which consists of a plurality of dogs mounted on a common vertical shaft, which is independently actuated and adjustable.

It is an additional feature of my invention to provide adjustable wearing plates for the cross head, of replaceable and detachable material.

It is an additional object of my invention to provide a four-way adjustment of the walls of the rear portion of the baling chamber.

It is an additional object of my invention to provide a built-up steel construction of the plunger or plunger head and in particular to provide a novel form of plunger head which can be easily and cheaply manufactured, but which will have requirements of strength and ease of replacement not heretofore obtainable.

In the accompanying drawings:

Figure 1 is a top plan view of the complete press;

Figure 2 is a side elevation of the complete press with the feeding board in its elevated position;

Figure 3 is a longitudinal section taken on a vertical plane through the baling end of

the press, showing the feeding board in its lowered position;

Figure 4 is a similar view showing the feeding board after it has come in contact with an obstruction and its safety device has been brought into operation;

Figure 5 is a section on the line 5—5 of Figure 1, showing the driving shaft and the method of adjusting it in its horizontal position with reference to the rest of the mechanism;

Figure 6 is a section on the line 6—6 of Figure 2, showing the arrangement of the lower bearings of the lower stud shafts and gears, together with a section showing the construction of the plunger head;

Figure 7 is a section through the wedge ring used in the adjustment of the bearings and shaft position, such as shown in Figure 5;

Figure 8 is a plan view of this ring showing the apertures for the clamping bolts;

Figure 9 is a section on the line 9—9 of Figure 1 showing the four-way adjustment for the rear portion of the baling chamber;

Figure 10 is a section on the line 10—10 of Figure 1, showing the arrangement of the wearing plates and of the plunger head;

Figure 11 is a front elevation of the division block;

Figure 12 is a section on the line 12—12 of Figure 11;

Figure 13 is a section on the line 13—13 of Figure 1, showing in detail the feeding block and the retaining dogs;

Figure 14 is an elevation partially in section of the safety toggles;

Figure 15 is a plan view partially in section showing in detail a pair of the retaining dogs;

Figure 16 is a perspective of the feeding block mechanism and its safety device;

Figure 17 is an elevation showing the timing mechanism for timing the actuation of the division block, support and slide.

Referring to the drawings in detail, 1 is a base or platform on which is mounted the press. A plurality of transverse I-beams, 2, 3, 4 and 5, are arranged transversely on this platform for the purpose of supporting the bottom plate 6. This plate is further reinforced by a plurality of transverse angle irons, 7, 8, 9 and 10. Side rails 11 and 12 of plate 6 are provided on this support, longitudinal, upon which members, 11 and 12, are the angle irons or rails 13 and 14 which are supported and bolted by the bolts 15. To these lower rails, 13 and 14, are bolted by the bolts 16, the side plates 17 and 18. These side plates extend upwardly within and above upper rails 19 and 20 which are bolted thereto by the bolts 21. These side plates are capped at their upper end by a plate 22. 23 designates a driving pulley which is driven by a belt from any suitable source of power. This

pulley is mounted upon the driving shaft 24 which carries the driving pinion 25 which drives a driven gear 25a on the driven shaft 24a. On the other end of the shaft 24 is a fly wheel 26. The shaft 24a is journaled in a plate 27, the inner margins of which rest upon the shoulders 28 of the side plate. As these side plates are roughly formed and as the disks 27 are likewise relatively roughly formed, it may result that the driving shaft is not in its proper position in a suitable horizontal plane. In order to prevent the necessity for a heavy, perfectly manufactured structure for this purpose which would be prohibitive in its expense, I provide the following arrangement for adjusting this driving shaft in its horizontal plane, so that it will turn in its bearings 29 in the plane desired.

The disk 27 is provided with flanges 30 having concave faces 31. Between this concave face and the side plate is a wedge disk 32 having a wedge margin with a convex surface 33. This disk is provided with slots internally disposed, designated 34, through which the bolts 35 pass for retaining the several members together in position on the side plate. Thus, if it is desired to change the angularity of the driving shaft to the horizontal plane, a shifting of this wedge plate upwardly or downwardly will effect the desired end. Bolts can then be clamped and the structure will be held in the desired position.

On this driving shaft 24a are a pair of spaced pinions 36, held in position by the keys 37 in the conventional way. These pinions engage with their respective gears 38. These gears are mounted on suitable shafts carried by the side plates, as will be more fully seen in Figure 6. The gears 38 are known as the pitman gears. They are mounted upon a bearing sleeve 39 over the end of which is a plate 40 bolted to the gear by the bolts 41. A receiving cup 42 on the inside of this plate receives a square shaft 43, the other end of which turns in a bearing 44 on the interior of the plate 45 which carries the stud shaft 46 for supporting the gear and its bearing 39. This square shaft 43 carries a retaining cotter or sleeve 47. The plate 45 is bolted to the side plates by the bolts 48.

On the rim of each gear is an aperture 49 carrying the end of a cross pin 50, on which is journaled a pair of plates 51 constituting the pitman. These plates are bolted together by the bolts 52. A similar arrangement is found at the other end of the pitman which are bolted together by the bolts 53 on a sleeve 54 mounted on a cross pin 55 which is journaled in the bearings 56 and bolted by the bolts 57 on the vertical plates 58, which constitute a portion of the plunger. This construction will be seen in Figure 10.

These plates 58 are provided with outward-

ly extending flanges 59 at the top and bottom. The bottom flanges are provided with side guide plates 60 which are bolted to the flanges 59 by the bolts 61 which also retain the inverted U-shaped jaw 62 for supporting the roller 63 which rolls upon the bottom plate 6. The U-shaped member 62 is provided with shoulders 64 which fit on either side of the flange 59. The top flange 59 has supported thereon a top plate for the plunger 65, which engages with the wearing plates 66. These wearing plates are preferably of wood and are suspended by the bolts 67 from the cap plate 68.

The end of the plunger head is formed by a steel plate 69 connected to the vertical side plates 58 by internally disposed angle irons 70 bolted to the plate 69 in the plate 58 by the bolts 71. This provides a light weight but extremely strong assembly and disassembly structure. It is a matter of great advantage to have a built-up structure of this character with a steel built plunger head.

Mounted on the interior of this plunger is a link 72 pivoted at 73 on the plunger, and at its other end 74 to the curved end 75 of a driving arm 76. This driving arm is carried on a bracket 77 which, in turn, is pivoted upon a cross shaft 78 carried in the bracket 79 on a transverse portion 80 of the housing which is connected to the side plates of the frame. On this same transverse pin 78 is pivotally mounted the lower block arm 81, the outer end of which is curved downwardly as at 82 to a point where it is pivotally mounted upon the cross shaft 83 carried in the bracket 84 on the feeding board 85. The upper end of this bracket 84 carries a second pivotal member 86 to which is connected a spacing link 87, the other end of which is pivoted at 88 on a bracket 89 carried on the same transverse portion 80.

The feeding block is provided with a pair of downwardly extending and diverging segregated feeding fingers 90. A follower member 90a is provided on the one face of the feeding board.

In order to prevent injury to this mechanism, if the end of the feeding board comes in contact with an object which cannot be compressed, as in Figure 4, it will be noted that the driving arm 76 carried on the end thereof pivotally at 91, a frame or link 92, the upper end of which is pivoted at 93 to a second frame 94, the other end of which is pivoted at 95 to the arm 81. Between the pivotal points 91 and 93 is a cross pin 96 on which is mounted the eye 97 of a pin 98, the other end of which carries a nut 99 and washer 100 for engagement with a helical spring 101 surrounding the pin 98 and having its other end engaging upon a washer or plate 102 mounted on the frame member 94. 103 is a stop member carried by the arm 81.

When this block is moved downwardly, if its movement is resisted by an obstacle, such as 104, while the machinery continues to move, the arm 76 will continue in its downward movement and in doing so will tend to pull backwardly and downwardly the member 92 and the member 94 which are pivoted together at 93. The movement of 94 is resisted by the eccentric bolt 103. It will be noted that, due to this arrangement, the leverage will continue to increase while the spring resistance will not proportionately increase so that the strain upon the feeding board will not increase, due to the increase of tension of the spring. The reason that this increased leverage is obtained in greater ratio than the increased resistance offered by the coil springs is that the toggle formed by 94 and 92 opens wider and wider as the power continues and thus the links in the toggle pull on a line that moves further and further from the dead center.

The division block 105 is dropped into the hopper 106 through which material is introduced to be compressed into the baling chamber 107 by the U-shaped division block supports 108 which is pivoted on top of the baling chamber at 109 and is actuated by a lever or levers 110. These supports 108 are spaced to support the edges of the block. The blocks are held in position as they slide into the hopper by the guides 111 which are mounted on the slides 108. It will be noted that these division blocks are provided with a central member 112 and spaced keystone members 113 on either side thereof which have slots of tapered cross section designated 114 therebetween with the narrow end of the slot on the outside. This provides a space through which the wires may be inserted.

In controlling the starting and stopping of the machine, I provide a clutch lever 115 which carries a link 116 pivotally connected to a bell crank 117 which is pivoted on a bracket 118 on the frame. The other end of this bell crank is connected to a clutch of any desired kind 119, which connects the power from the pulley to the driven shaft 120, as desired.

The shaft 120, on which the lever 115 is mounted, extends across the machine and on the other side carries a bracket 121 which engages with the periphery of the fly wheel 26.

It will be noted that the construction of the actuating mechanism for the feeding block consists of a pair of arms 76, a pair of arms 81 and a pair of springs 101. Such an arrangement gives a steadier machine and insures that the block will be maintained in its predetermined positions.

Turning to the rear end of the baling chamber and in particular to Figures 13 and 15, it will be noted that a plurality of slots 122,

one above the other on either side of the machine in the side walls 123 of the baling chamber. Through these slots project the tapered noses 124 on the retaining arms or
 5 retainer dogs for retaining the division block. These retaining dogs 125 on each side are mounted on a common vertical shaft 126 which has supporting eyes 127 on plates 128
 10 attached by the bolts 129 to the side walls 123. The outer ends of the dogs are provided with eyes 130 into which is hooked a helical spring 131, the other end of which
 15 is mounted on a U-shaped bolt 132 that is adjustable through the nuts 133 in its position to adjust the tension of the spring 131. These bolts pass through a bracket 134 on the
 20 outside of the side walls 123. Thus, the groups of retaining dogs are adjustable but are supported upon a common vertical shaft on their respective sides in their respective series.

The rear end of the baling chamber has mounted on the sides thereof, spaced from one another, a pair of plates 135. These
 25 plates are mounted upon supporting members which are T-shaped, designated 136, the flanges of which are connected by bolts 137 to U-shaped members 138 carried on the screw 139. This screw turns in a cotter 140 which
 30 has eyes 141 in which are pivoted the links 142. These links are pivoted at their other ends 143 to the cross members 144 at the top and the cross members 145 at the bottom. These cross members carry bottom plates 146
 35 and top plates 147 to which they are bolted by the bolts 148 and 149. Side flanges 150 and side plates 151 are carried thereby.

A similar screw construction is carried at
 40 either end. The ends of these plates 135 extend outwardly and parallel to the baling chamber and are mounted upon the ends of the stationary side plates 123 of the baling chamber and are held in position on the
 45 bolts 152 by the helical spring 153 surrounding the bolts.

The other ends of the plates 135 are supported by the construction shown in Figure 9, consisting of the screws 139 and associated
 50 mechanism. The top and bottom plates 146 and 147 are thus adapted to be drawn together simultaneously by the drawing together or expansion of the side members 135, so that the pressure is equalized on all four
 55 sides, strains are relieved and the size of the baling chamber is adjustable. The bracket arms 154 carry a delivery platform 155 at the exit end of the baling chamber.

60 The synchronism of the dropping of the spacer block or division block is effected through a pitman 156 which is mounted on the crank 157 on the shaft 43. Its other end is provided with a slotted portion 158 which
 65 works on a pin 159 connected to a lever 160

which is mounted on the shaft 109 of the division dropper 108.

Method of operation

The power is applied to the pulley wheel
 70 23 which is communicated to the driven shaft 24 which turns the pinion 25. This results in driving the gear 25a, the driven shaft 24a, the pinions 36, the gears 38, the pitman 51,
 75 the plunger and plunger head, so that the material which has been fed through the hopper by the feeding block will be compressed and forced into the baling chamber between the division blocks. The feeding block moves
 80 upwardly and downwardly in substantially a vertical plane, due to the fact that the distance between 88 and 86 are constant while the distances between the points 78 and 83
 85 are varied due to the fact that the link 87 is a straight link and link 81 has a curved end 82 which is connected to the lower portion of the feeding board. This permits of the straight down feeding of material into
 90 the chamber and the withdrawal in a substantially straight line of the feeding block to prevent pulling the material out again.

In the event of wear, due to the thrust of the plunger upwardly against the top of the machine, the wearing blocks of wood
 95 can be taken away and new ones replaced. The bottom of the plunger is carried on rails so that the friction at that point is thus taken care of.

The safety device has already been described. In the event of stopping of the
 100 feeding board, the machine can continue to operate without having any damage or excess force applied to the feeding board or associated mechanism due to the give of the
 105 spring 101 and the U-shaped toggle members 92 and 93 which work one within the other between the pairs of arms 81 and 76. It will be understood that the means of adjusting the horizontal position of the driven
 110 shaft is also used in connection with the driving shaft. It can be used with the other shafts, as desired.

It will be also understood that I desire to comprehend within my invention such modifi-
 115 cations as may be necessary to adapt it to varying conditions and uses.

Having thus fully described my invention, what I claim as new and desire to secure by Letters Patent, is:—
 120

1. In a baler, a feeding board, supporting arms therefor, actuating arms, means for pivotally mounting said supporting arms intermediate the ends of said actuating arms, guiding means for said feeding board, and yield-
 125 ingly controlled means comprising a plurality of links pivoted together to form a toggle and connecting said actuating arms at their ends at points midway of said supporting arms.
 130

2. In a baler, a feeding board, supporting arms therefor, actuating arms, means for pivotally mounting said supporting arms intermediate the ends of said actuating arms, remotely pivoted guiding means for said feeding board, and yieldingly controlled means comprising a plurality of links movably connected to form a lever of variable length and connecting said actuating arms at their ends at points midway of said supporting arms.

3. In a baler, a feeding board, supporting arms therefor, actuating arms, means for pivotally mounting said supporting arms intermediate the ends of said actuating arms, guiding means for said feeding board, yieldingly controlled means comprising a plurality of links movably connected to form a lever of variable length and connecting said actuating arms at their ends at points midway of said supporting arms, a plunger and means for connecting said plunger to said actuating arms, whereby said plunger and feeding board may be synchronously operated.

4. In a baler, a power means, a reciprocating plunger, a baling chamber therefor having a hopper opening for introducing material into the chamber, a feeding board, an arm pivoted to said board and to said baler for directing the upper end of the board, a lower arm connected to said baler and to a lower portion of said feeding board, so arranged as to move said board about its pivot with the upper arm and to maintain the board in its vertical position, and an actuating means connected to said lower arm and directly connected to the compressor means whereby as the compression means reciprocates, the board will be raised and lowered in a substantially vertical position, and a safety device between said lower arm and said actuating arm whereby if the board is obstructed in its movement the feeding arm will continue to operate without forcing the feeding board and its arm to operate, said safety mechanism consisting of a toggle joint and a compression spring, so arranged that as the toggle joint continues to open, the leverage of the toggle will increase to a greater degree than the compression force of the spring acting upon the feeding board and its actuating arm.

5. In a baler, actuating means adapted to move about a given pivotal point on the baler, an arm pivoted on said point and connected to said actuating means adapted to actuate a feeding block and maintain said block in a vertical position during the feeding operation and a second arm pivoted on the baler and to said feeding block to maintain said block in a predetermined path with reference to the baler, means comprising a toggle between said actuating means and first mentioned arm whereby said feeding block if obstructed may come to rest while the actu-

ating means will continue to actuate without injuring the rest of the mechanism.

6. In a baler, actuating means adapted to move about a given pivotal point on the baler, an arm pivoted on said point and connected to said actuating means adapted to actuate a feeding block and maintain said block in a vertical position during the feeding operation and a second arm pivoted on the baler and to said feeding block to maintain said block in a predetermined path with reference to the baler, means between said actuating means and first mentioned arm whereby said feeding block if obstructed may come to rest while the actuating means will continue to actuate without injuring the rest of the mechanism, said actuating means being connected to a reciprocating plunger operating the baling chamber for compressing material therein, the connection between the first mentioned arm and the actuating means being composed of a toggle joint and a compression spring so arranged that the increasing of leverage of the toggle joint as the actuating means moves away from the lever will be greater than the compression force of the spring being compressed and its action upon the arm of the feeding block.

7. In a baler, a feeding means consisting of a feeding block, a spacing means, a supporting means, a power actuated means and means for connecting the supporting means and power actuated means consisting of U-shaped toggle members pivoted to one another and to the power actuated means and supporting means respectively, a compression means pivoted to one of said toggle members and a compression spring mounted on said compression means and the other of said toggle members, means to limit the pivotal movement of the toggle member on the supporting means whereby when the feeding block is obstructed the leverage of the toggle will increase to a greater degree than the compression force of the spring.

8. In a baler, a feeding means consisting of a feeding block, a pair of spaced spacing arms pivoted on the block and the baler, a pair of spaced actuating arms pivoted at a lower point on the baler and at a lower point on the feeding block, a second pair of actuating arms pivoted on the same pivotal point of the actuating arms on the baler, link means of connecting said pairs of actuating arms so that if the feeding block is obstructed the second pair of actuating arms will continue to operate, a link connecting said second pair of actuating arms to a reciprocating plunger in the baler and means for actuating said reciprocating plunger in the baler.

9. In a baler, a power means, a reciprocating plunger, a baling chamber therefor having a hopper opening for the introduction of material into the chamber, a feeding board,

an arm pivoted to said board and to said baler for directing the upper end of the board, a lower arm pivoted at one end to said baler and at the other end to the lower portion of said feeding board and so arranged
5 as to move said board about its pivot with the upper arm and to maintain the board in a vertical position, and an actuating means comprising a lever yieldingly connected to
10 said lower arm and unyieldingly connected to the reciprocating plunger whereby as the plunger reciprocates the board will be raised and lowered in a substantially vertical position.

15 10. In a baler, a baling chamber, a compression means and a hopper for introducing material into the baling chamber, a feeding block, a spacing arm pivoted thereto and to the baler, a supporting arm pivoted to the
20 baler and to the feeding block and so arranged that as the feeding block is raised and lowered the feeding block will be moved about its pivotal connection with the spacing arm and maintained in a substantially vertical
25 position as it rises and falls, an actuating arm pivoted on the same pivot as the supporting arm, one end of said actuating arm being connected to the compression means, and link mechanism connecting the
30 actuating arm to the supporting arm.

11. In a baler having a baling chamber, a compression means and a hopper for introducing material into the baling chamber, a feeding block, a spacing arm pivoted thereto
35 and to the baler, a supporting arm pivoted to the baler and to the feeding block and so arranged that as the feeding block is raised and lowered the feeding block will be moved about its pivotal connection with the spacing
40 arm and maintained in a substantially vertical position as it rises and falls, an actuating arm pivoted on the same pivot as the supporting arm and having one of its ends connected to the compression means, and
45 means connecting the other end of the actuating arm to said spacing arm and said supporting arm, said last-named means comprising a pair of link members pivoted to each other at one end, the other end of one
50 of said members being pivoted to the actuating arm and the other end of the second member being pivoted to the supporting arm, and a spring connection between said members.

55 In testimony whereof, I affix my signature.
BRUCE ROLLMAN.