

No. 635,663.

Patented Oct. 24, 1899.

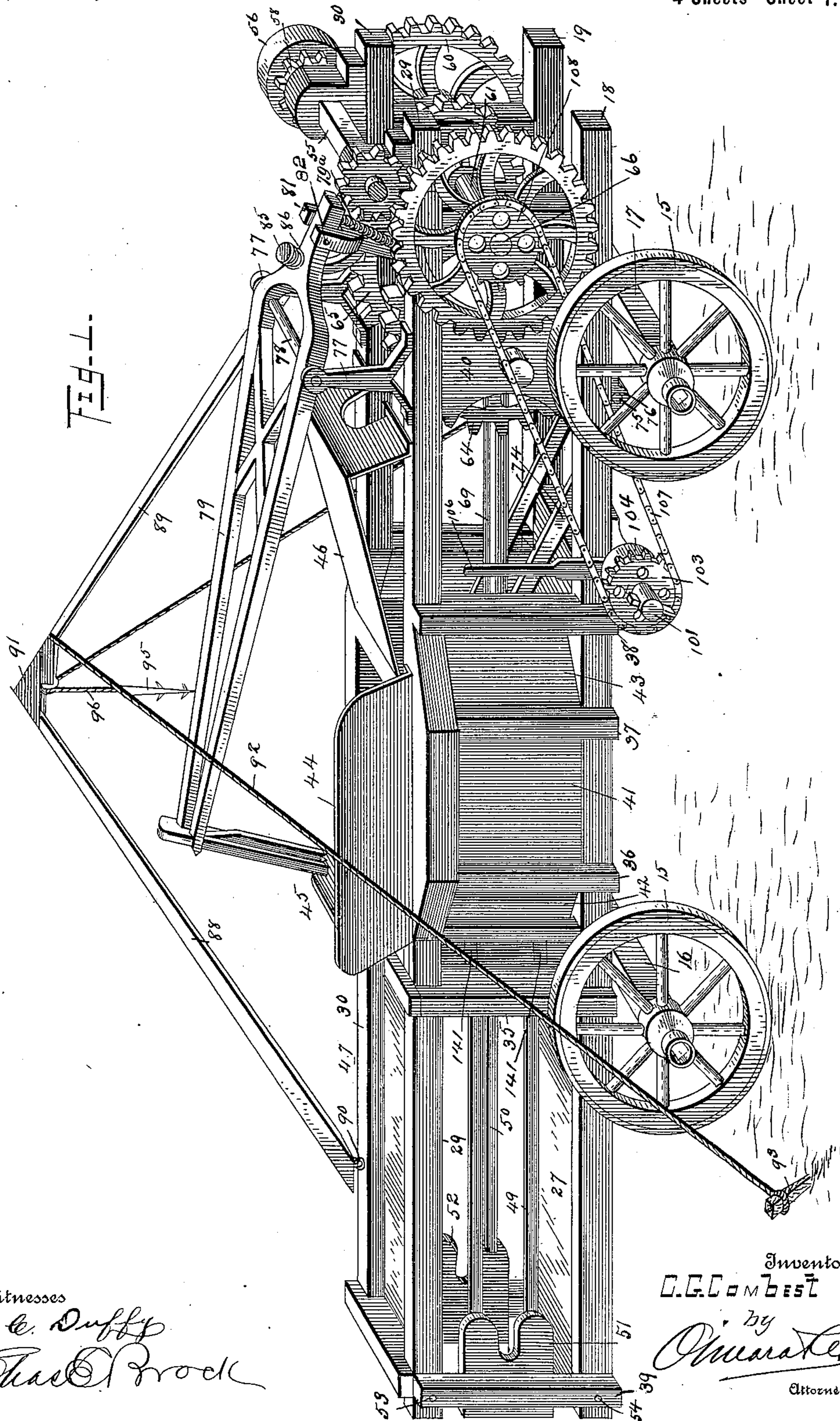
C. G. COMBEST.

HAY PRESS.

(Application filed Oct. 29, 1898.)

(No Model.)

4 Sheets—Sheet 1.



Witnesses

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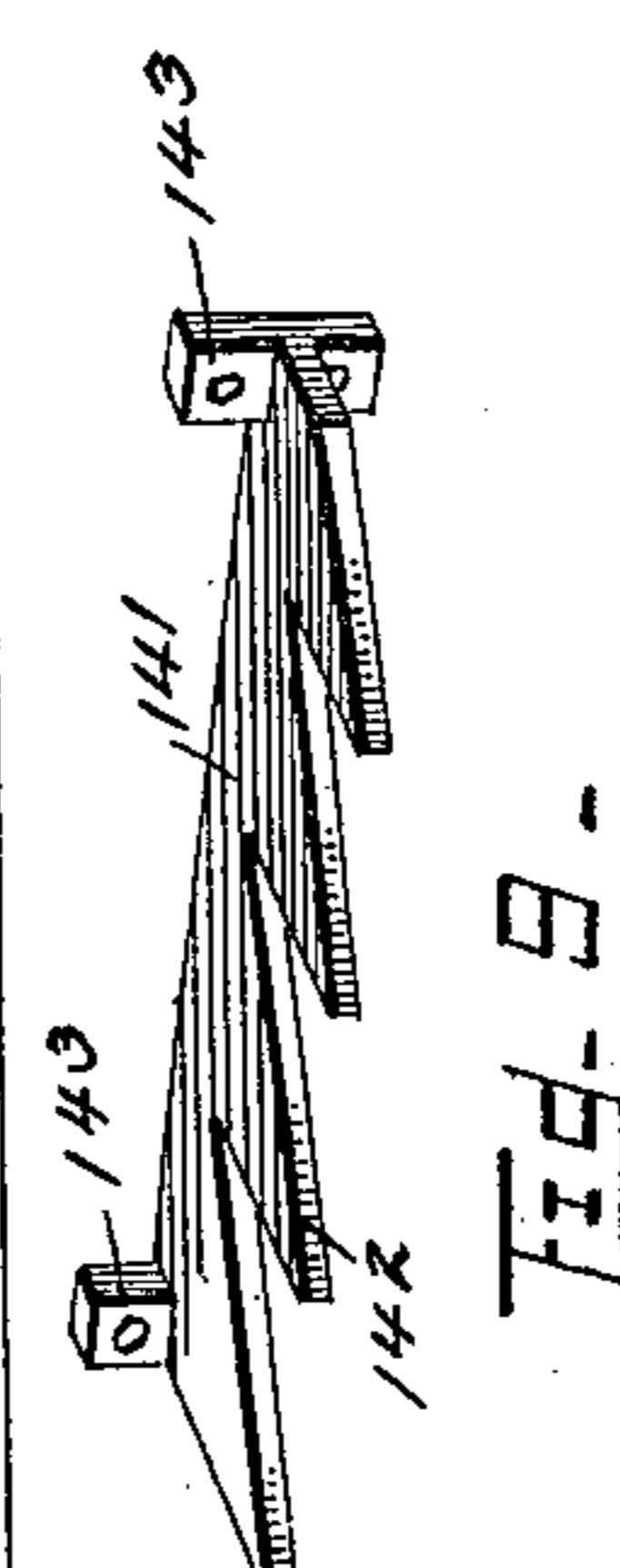
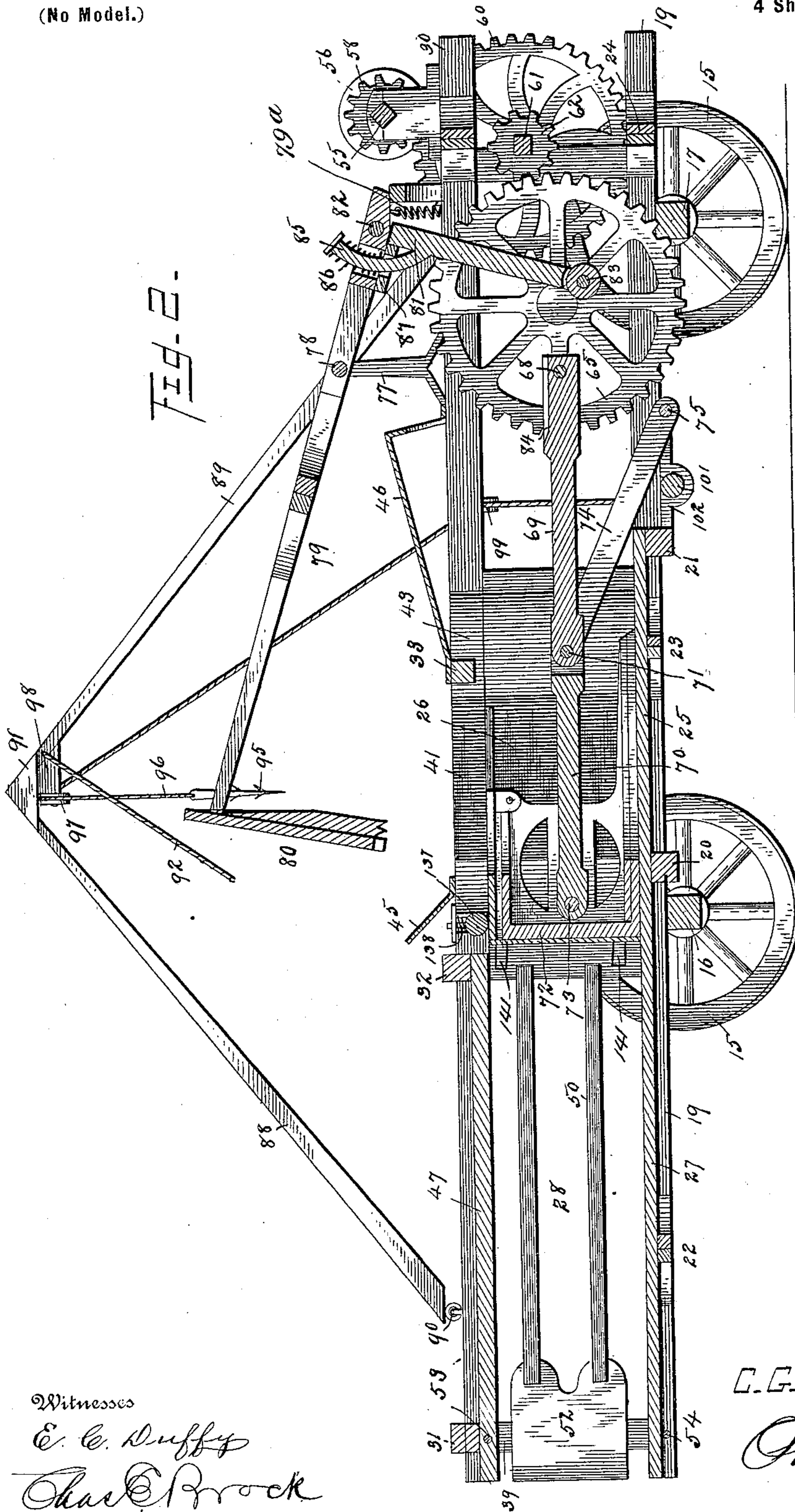
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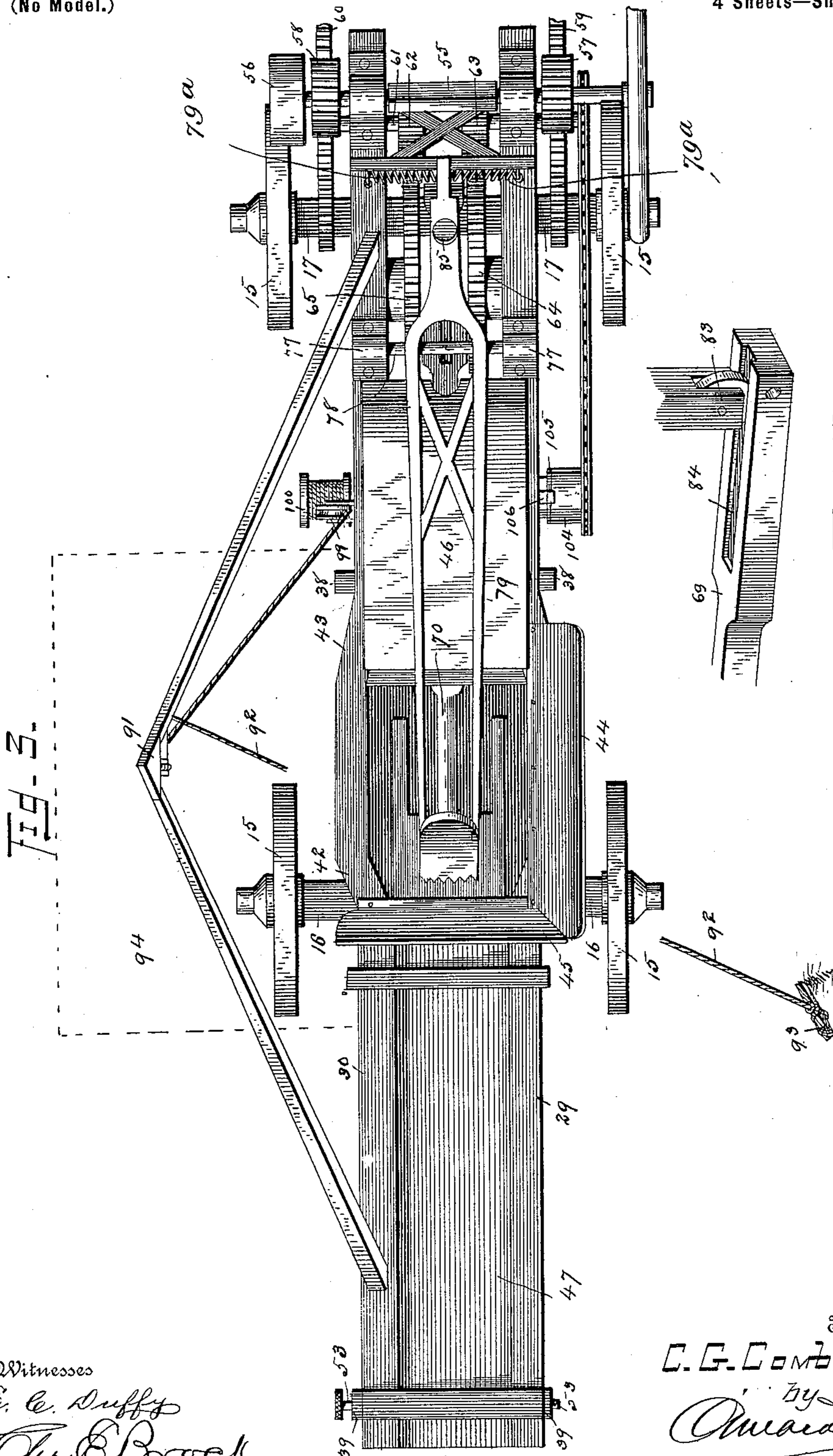
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4 Sheets—Sheet 3.



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Fig. 4.

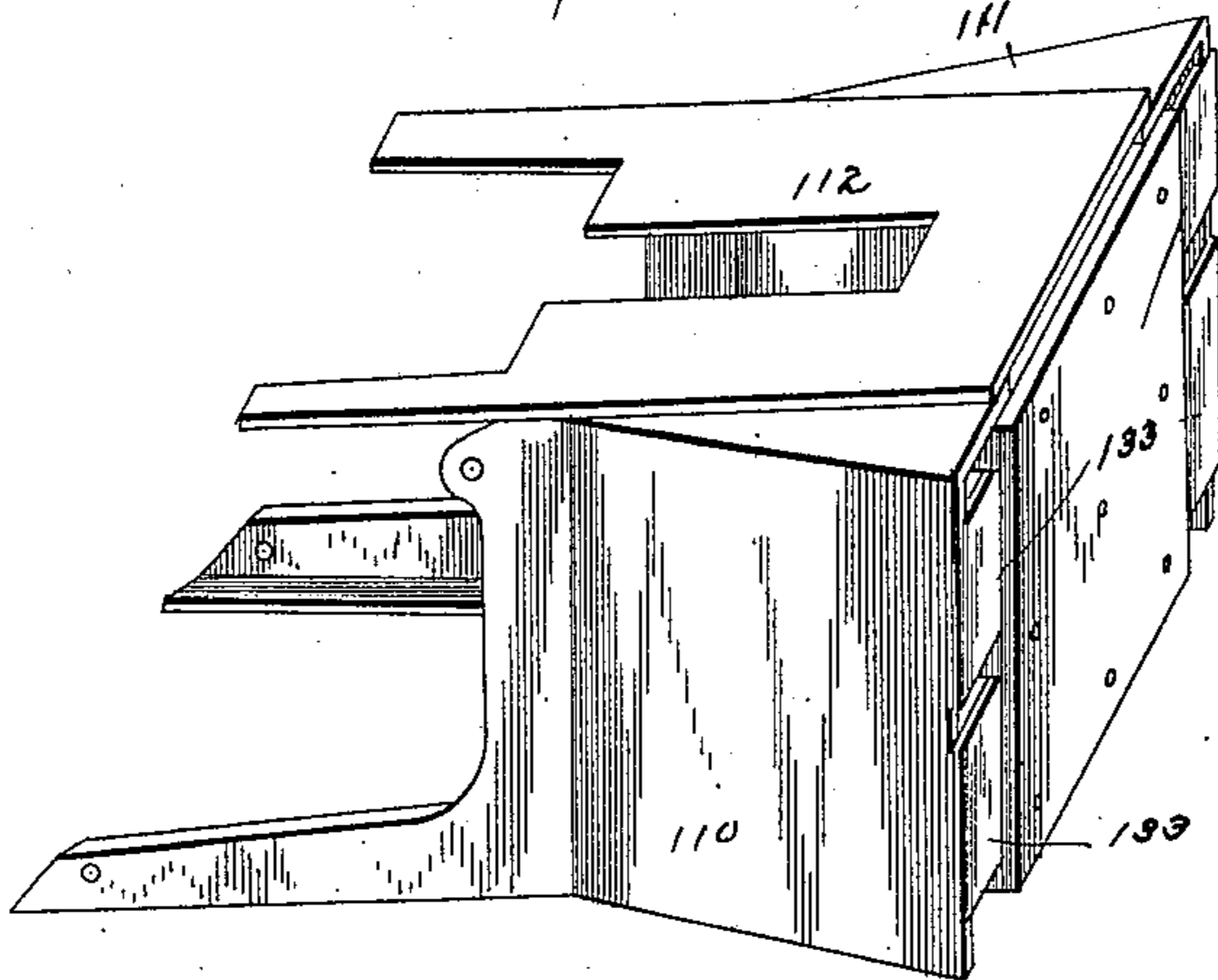


Fig. 8.

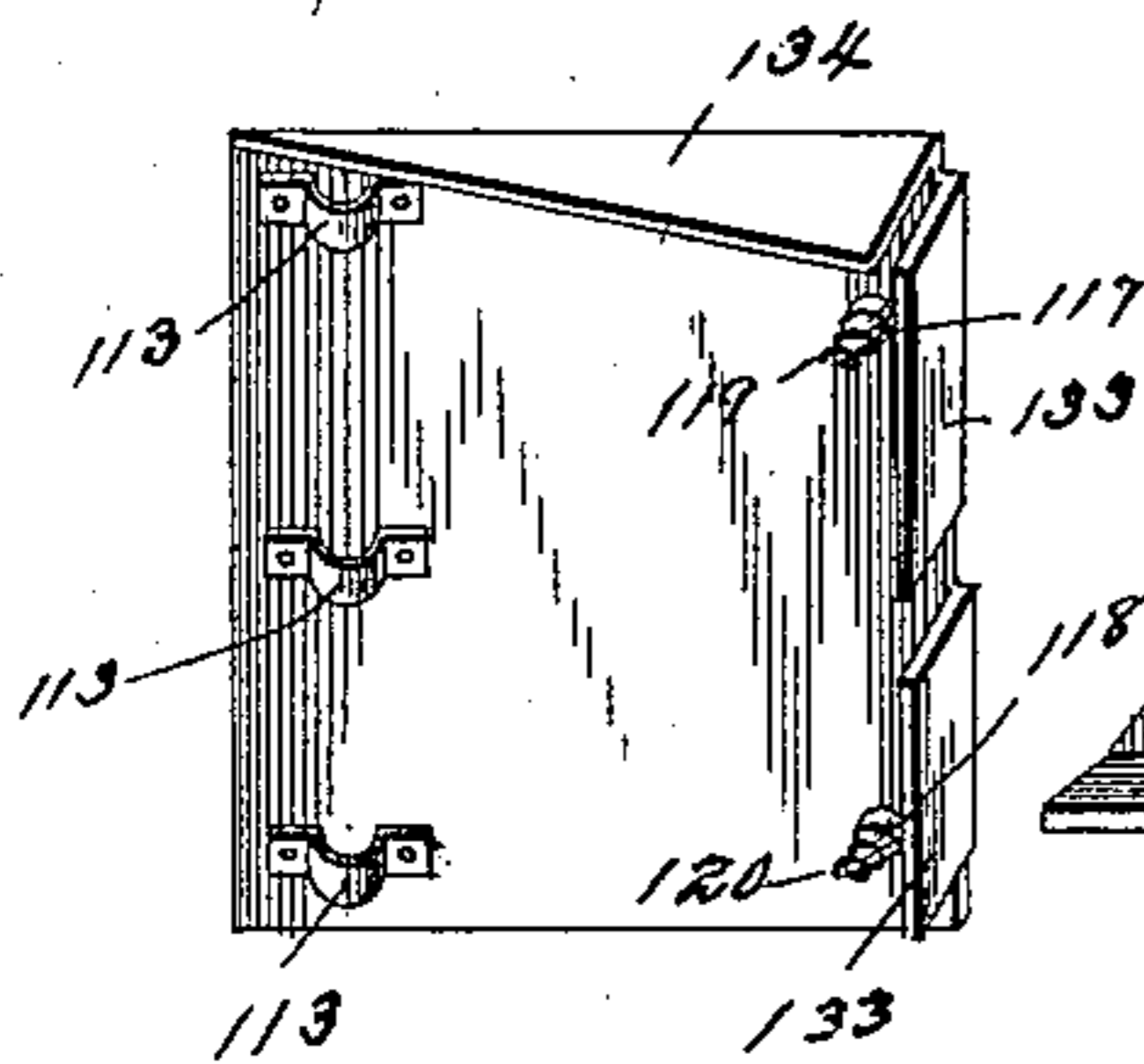


Fig. 5. Fig. 5A.

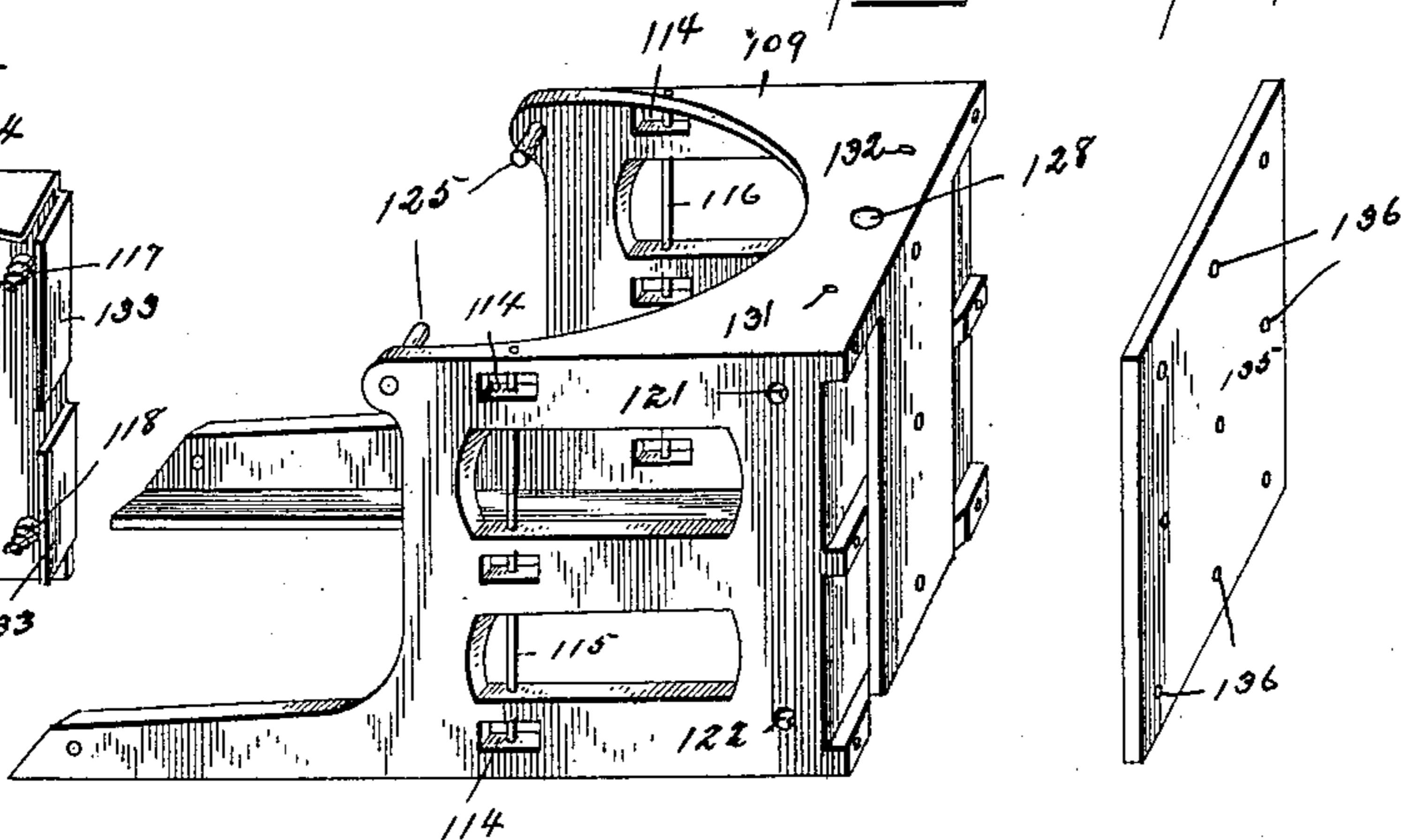


Fig. 6.

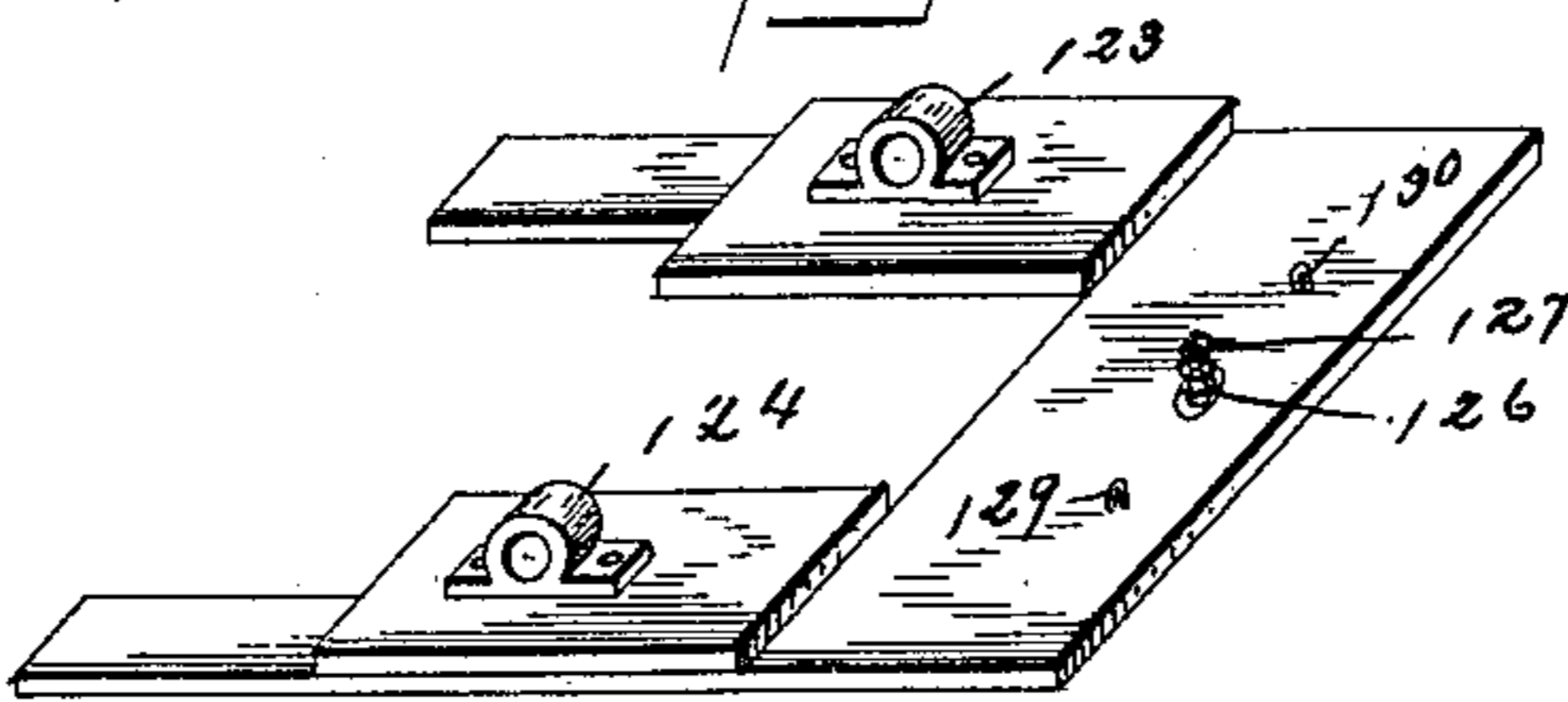
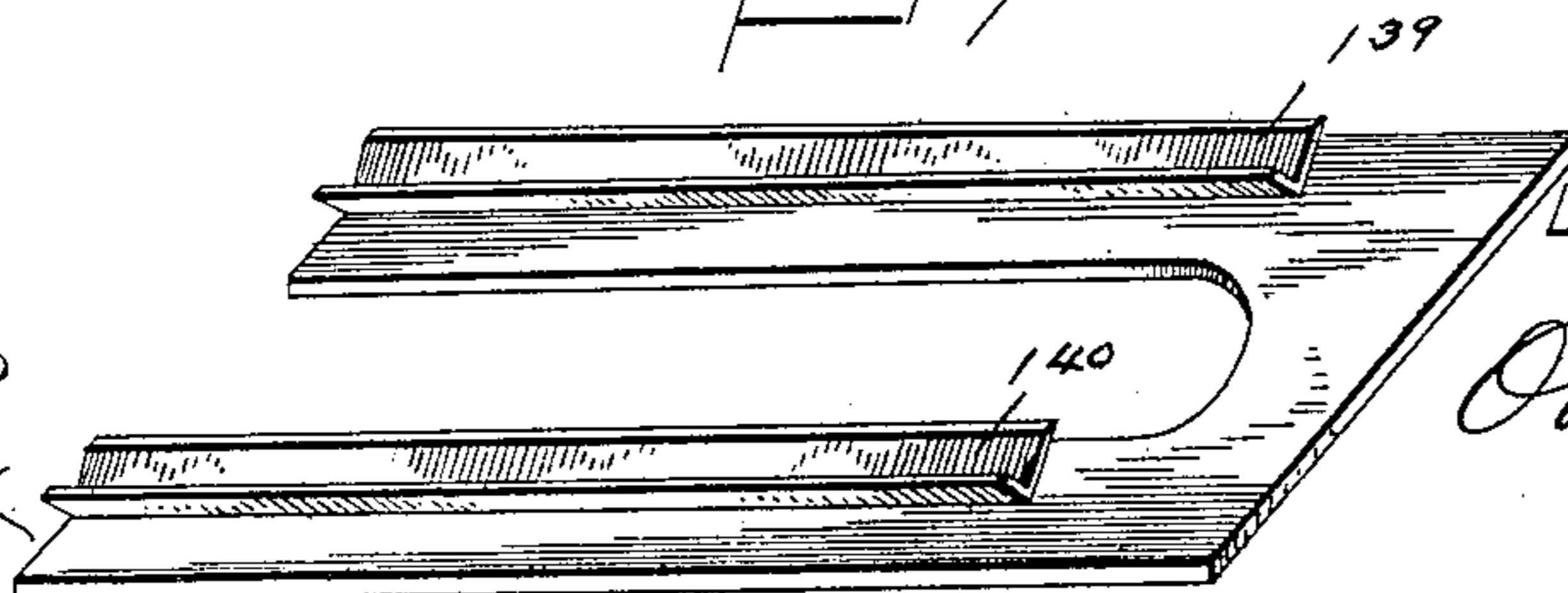


Fig. 7.



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UNITED STATES PATENT OFFICE.

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HAY-PRESS.

SPECIFICATION forming part of Letters Patent No. 635,663, dated October 24, 1899.

Application filed October 29, 1898. Serial No. 694,932. (No model.)

To all whom it may concern:

Be it known that I, CHARLES GRANVILE COMBEST, a citizen of the United States, residing at Pana, in the county of Christian and State of Illinois, have invented a new and useful Hay-Press, of which the following is a specification.

My invention relates to presses especially intended for baling hay, the object of the invention being to generally improve the construction and operation of such presses.

With this object in view my invention consists in improved means for performing the several operations necessary to a complete press of this class, the construction, arrangement, and combination of the parts of which will be fully described hereinafter, the particular points of novelty therein being specifically set forth in the appended claims.

In order to enable others skilled in the art to which my invention most nearly appertains to make and use the same, I will now proceed to describe its construction and operation, having reference to the accompanying drawings, forming part hereof, in which—

Figure 1 is a perspective view of a hay-press constructed in accordance with my invention. Fig. 2 is a vertical longitudinal sectional view. Fig. 3 is a top plan view of the same, part of the guy-rope being broken away and the table or platform at the side of the press being shown in dotted lines. Fig. 4 is a detail perspective view of the plunger detached from the press. Fig. 5 is a similar view of the same with the side wings or folders removed. Fig. 5^a is a similar view of the plunger face or cap detached. Fig. 6 is a detail perspective view of the upper folding wing of the plunger inverted. Fig. 7 is a detail perspective view of the bottom plate of the plunger inverted. Fig. 8 is a detail perspective view of one of the wings or folders. Fig. 9 is a detail perspective view of one of the hay-retainers. Fig. 10 is a fragmentary detail perspective view showing the inner end of the pitman and the lower end of the upright arm connected with the feeder-beam of the feeding-packer.

Like numerals of reference indicate the same parts in all the figures of the drawings.

Referring to the drawings by numerals, 15 indicates wheels of ordinary construction

mounted upon axles 16 17, upon which the press is supported, so that it may be readily moved from place to place. Main beams 18 19 extend from end to end on each side of the press and rest upon the axles 16 17, forming the support of the whole press. These beams are suitably connected by cross-beams 20 21 and braces 22, 23, and 24. Upon cross-beams 20 and 21 and braces 22 and 23 are secured planks, (or plates of metal,) which form the bottom 25 of the feed-chamber 26 and the bottom 27 of bale-chamber 28. There are also longitudinal beams 29 and 30 above and in line with the beams 18 and 19, running the entire length of the press, connected together by cross-beams 31, 32, and 33 and by braces 34 and to the beams 18 and 19 by uprights 35, 36, 37, and 38 on each side of the feed-chamber, tension-bars 39 at the outer end of the bale-chamber, and castings 40, of any suitable design, in which are formed bearings for the operating-shafts, as will be hereinafter described.

The feed-chamber is inclosed by sides, which also connect beams 18 and 19 with 29 and 30, said sides being constructed so as to widen the chamber in its central portion, the portions 41 being widest apart and the portions 42 and 43 inclining inward toward the ends, these ends of the chamber being of a width equal to the width of the bale-chamber and of the main body or frame of the plunger, the object of the widening of the feed-chamber being to accommodate a larger quantity of loose hay.

The feed-chamber and the bale-chamber are lined with metal throughout, and at the mouth or top of the feed-chamber are arranged inclined side and end plates 44, 45, and 46 to facilitate the placing of the hay therein. The top and bottom 47 and 27 of the bale-chamber are solid, while the sides are formed of strips 49 and 50, extending longitudinally and secured at their rear ends to tension-plates 51 and 52, which in their turn are secured to tension-bars 39, said tension-bars being secured by rods 53 and 54, which pass entirely through the longitudinal beams and the connecting cross-beams, whereby the width of the bale-chamber may be slightly varied at its discharge end.

55 indicates a shaft mounted transversely

of the press in suitable bearings and provided on either or both ends with a band-pulley 56, by means of which the power of any suitable tread-mill, horse-power, engine, or motor is communicated to the press. This shaft is also provided with two pinions 57 and 58, which engage with gear-wheels 59 and 60, mounted on transverse shaft 61, journaled in suitable bearings and carrying inside of the frame of the press two pinions 62 and 63. The pinions 62 and 63 engage with gear-wheels 64 and 65, mounted on stub-shafts 66 and 67, journaled in suitable bearings formed in the castings 40, said stub-shafts extending from the outer face of the castings to the inner face of the gear-wheels 64 and 65, leaving a clear space between the two wheels. Connecting the two wheels and crossing this space is a crank-pin 68, upon which is pivotally connected a pitman 69, which at its outer end is pivoted between the bifurcated ends of a toggle-lever 70 by means of a pin 71, the opposite end of the toggle-lever 70 being pivoted to the plunger 72 by means of a pin 73. Upon the pin 71, which connects the pitman 69 and toggle-lever 70, is also pivotally connected on each side of the bifurcated ends of the toggle-lever 70 one end of a toggle-lever 74, which toggle-levers 74 are mounted at their opposite or outer ends upon a transverse pin or shaft 75, journaled in suitable bearings 76, rigidly fixed to the under side of the beams 18 and 19.

By means of the construction just described the plunger will be reciprocated in the feed-chamber to compress the hay horizontally. To pack the loose hay vertically in the feed-chamber, I have provided the following mechanism:

77 indicates a bracket, of which there are a pair, one mounted on the top of the longitudinal beam 29 and one on the top of the longitudinal beam 30. A cross pin or shaft 78 is journaled in the upper ends of the brackets 77, a steel feeder-beam 79, which extends forward to a point vertically above the feed-chamber, being mounted upon said pin or shaft 78. At the forward end of the feeder-beam 79 is fixed a vertical arm 80, depending downward in line with the feed-chamber. At the rear end of the feeder-beam is pivotally attached a depending arm 81, the upper end of said arm being bifurcated and embracing the rear end of the feeder-beam and pivotally connected thereto by means of a pin 82. Coiled springs 79^a connect the rear end of the feeder-beam with the side sills of the main frame. At its lower end the arm 81 is also bifurcated and carries a friction-roller 83, adapted to engage in a groove 84 in the upper surface of the inner end of the pitman 69 in a manner hereinafter described.

The arm 81 is provided with a projecting curved guide-bar 85, which passes through an opening in the feeder-beam 79, a spring 86 being coiled around the guide-bar and having its end bearing against the bottom of the open-

ing and a cap or head on the outer end of the guide-bar. A stop 87 prevents the arm 81 from being drawn too far forward by the spring 86. That portion of the feeder-beam 79 outside of its pivotal pin 78 will be made sufficiently heavy to counterbalance the inside portion, so that the normal position of the inner end and its arm 80 will be raised out of the feed-chamber. In operating the press the wheels 64 and 65 will be rotated in the direction indicated by the arrow in Fig. 2, and as the crank-pin 68 passes downward from the position illustrated in that figure the plunger will be withdrawn from the feed-chamber and the pitman 69 will be carried under the friction-roller 83 in the lower end of the depending arm 81 of the feeder-beam. The continued rotation of the wheels 64 and 65 will continue to withdraw the plunger from the feed-chamber until the crank-pin 68 reaches a position at about one-third of a revolution from the point in which it is illustrated in Fig. 2. From this onward the movement of the crank end of the pitman will be upward, with the friction-roller 83 in the groove 84 pressing the outer end, with the arm 80, downward upon the hay in the feed-chamber in front of the plunger. When the pitman in the continuation of the rotation of the wheels 64 and 65 is again carried toward the feed-chamber, the friction-roller 83 will slip out of the groove 84 off the end of the pitman and fall again to its normal position, as illustrated in Fig. 2, thus withdrawing the depending arm above the feed-chamber and permitting the plunger to be again pressed forward into said chamber.

88 and 89 indicate two derrick-poles pivotally connected at their ends, as at 90, to the frame of the press and removably connected together at their upper ends by means of a metallic cap 91. These derrick-poles 88 and 89 are maintained in their normal position by means of a guy-rope 92, secured to a stake 93, (see Fig. 1,) said normal position being slightly inclined outward to bring their upper ends over the central portion of a table or platform, as indicated in outline by dotted lines at 94 in Fig. 3. A hay-fork 95 is suspended upon the end of a rope 96, which passes over a pulley 97, journaled in a block 98, secured to the pole 89, said rope passing thence downward around a pulley 99 to a drum 100 on the end of a shaft 101, journaled in bearings 102, secured to the frame of the machine. On the end of the shaft 101 is loosely journaled a sprocket-wheel 103, to which is secured one section 104 of a friction-clutch, the other section 105 being keyed to the shaft. A shifting-lever 106 engages the sliding section 105 of the clutch, so as to bring it into or out of contact with the section 104, as may be desired. A sprocket-chain 107 connects the sprocket-wheel 103 with the sprocket-wheel 108 on the shaft 66. The two sections 104 and 105 of the friction-clutch being disengaged, the sprocket-wheel 103 will turn upon the

shaft 101 without causing the shaft to rotate. When in this condition, the hay-fork 95 may be carried to a stack of hay and engaged therein, when by shifting the section 105 of the friction-clutch by means of the lever 106 the rope 96 will be wound upon the drum and the fork-load of hay raised to a position above the table or platform. By again disconnecting the clutch-sections the hay-fork and its load of hay will be dropped upon the table or platform ready to be deposited in the feed-chamber by a man or men standing upon the table or platform for that purpose. I am thus enabled to apply the power which drives the press in bringing the hay into convenient position for feeding into the feed-chamber without the exertion of manual strength for that purpose. The plates 44, 45, and 46 all incline toward the feed-chamber and facilitate the deposit of hay therein, preventing the hay from being spilled beyond the ends or far side of the chamber.

The special construction of the plunger for cooperating with the specially-formed feed-chamber forms a very important part of my invention and is illustrated in detail in Figs. 4 to 8 of the drawings.

The plunger consists of a main casting 109, (illustrated in detail in Fig. 5,) to which are pivoted two side wings or shutters 110 and 111, the latter being shown detached in Fig. 8, and a top wing 112. (Shown detached and inverted in Fig. 6.) The side wings 110 and 111 are provided with loops 113 on their inner faces, which fit into recesses 114 in the sides of the main frame of the plunger, pins 115 and 116 passing through the loops and forming hinges. Conical points 117 and 118 project from the inner side of the wings and have springs 119 and 120 around them, the points and springs entering recesses 121 and 122 in the sides of the main body of the plunger when the wings are in place. Similar loops 123 and 124 are formed on the under face of the top wing, and a pin 125, passing through this loop, hinges the wing to the main body. A conical point 126, spring 127, and recess 128 cooperate in the same manner as those of the side wings. Loops 129 and 130 project downward from the under face of the top wing 112 into recesses 131 and 132 in the main frame of the plunger and are adjustably secured therein to permit of only a limited movement of the top wing 112 on its hinges. The side wings or shutters are provided with front flanges 133 and a top flange 134, the front flanges being adapted to move in spaces in the front end of the plunger between the face of the plunger and a cap 135, secured to the main casting by screws passed through openings 136, while the top flange 134 slides in a space between the top of the main frame of the plunger and the top wing or shutter, all as shown in Fig. 4.

The normal tendency of the springs 119 and 120 is to throw the side wings or shutters outward, so that while the plunger is pressed for-

ward these wings will spread outward and occupy the full width of the central extended portion of the feed-chamber, as hereinbefore described. When the inclined portions 42 of the feed-chamber are reached, the extended wings will be folded close against the sides of the plunger, so as to permit them to pass into the bale-chamber, which is of less width. On the return movement of the plunger the side wings or shutters will be again moved outward until the inclined portion 43 of the feed-chamber is reached, against which they will rest at the inner end of the stroke of the plunger, as clearly shown in Fig. 3. When the plunger is nearing the end of its forward stroke, the top wings or shutters 112 will run under a roller 137, mounted in bearings normally pressed downward by springs 138, so that the top shutter will be closed against the main body of the plunger, as shown in Fig. 2.

In Fig. 7 I have illustrated the bottom of the plunger inverted, showing angular plates 139 and 140 rigidly secured on the under face thereof. These plates slide in similarly-shaped grooves in the floor of the press to properly guide the plunger in its movement and prevent its rising off the floor when force is applied to it.

In Fig. 9 I have illustrated one of the hay-retainers, each of which consists of a plate 141, provided with saw-teeth 142 and lugs 143, through which to pass screws or bolts to secure the retainer in position in the entry end of the bale-chamber. There will be two or more of these retainers on each side of the chamber with the teeth pointing toward the discharge end, so that the bale can be readily pressed toward the discharge end, but cannot be moved in the opposite direction.

The construction and specific operation of the various parts of my improved press will be readily understood from the foregoing description.

The general operation may be described as follows: Motion being imparted to the machinery through a belt (not shown) connecting the belt-pulley 56 with the driving power, the shaft 55 will be rotated, its motion being communicated to the shaft 61 through the pinions 57 and 58 and gear-wheels 59 and 60. Through the pinions 62 and 63 and gear-wheels 64 and 65 the motion is communicated to the crank-pin 68. The crank-pin through the medium of the pitman 69 operates the toggle-levers 70 and 74, causing the reciprocation of the plunger. On the forward movement of the plunger the packing-arm 80 is raised and upon the withdrawal of the plunger the depending arm is pressed downward to pack the hay into the feed-chamber. At various desired times the hoisting mechanism is brought into play by means of a shifting-lever 106, whereby the table 94 is kept supplied with hay ready to be deposited in the feed-chamber.

While I have illustrated and described definite constructions for each part of the

press, it will be of course understood that I do not wish to confine myself to the exact form of the various elements shown and described nor to any specific material, it being
5 well understood that the shape of the various parts or the material of which they are made may be changed to suit the fancy of the manufacturer without departing from the limit and scope of my invention.

10 Having thus fully described my invention, what I claim as new, and desire to secure by Letters Patent of the United States, is—

1. The combination in a hay-press provided with a feed-chamber laterally extended centrally and having inclined sides at its discharge end, of a plunger and means to reciprocate it in the chamber, the plunger being provided with normally-extended side wings to fill the extended portion of the feed-chamber, the inclined sides thereof serving to hold the wings against the plunger, substantially as described.

2. The combination in a hay-press, of the plunger, the main shaft, the gear-wheel, its crank-pin, the feeder-beam, a depending arm pivoted thereto at its rear end, a curved arm secured to the depending arm below the feeder-beam and passing through a slot therein, and a spring around the curved arm above
30 the feeder-beam to yieldingly hold the depending arm in the path of the pitman to be operated thereby, substantially as described.

3. The combination in a hay-press, of the plunger, the pinion, crank and pitman for
35 reciprocating the plunger, the pitman having a longitudinal groove in its upper surface ex-

tending to its inner end, a feeder-beam pivoted to the frame of the machine above the pitman, a depending arm pivoted to its rear end, a curved arm secured to the depending
40 arm and passing through a slot in the feeder-beam, a spring around the curved arm by which the depending arm is yieldingly held in the path of the pitman, and a friction-roller in the lower end of the depending arm
45 to engage in and intermittingly ride out of the groove in the pitman, substantially as described.

4. The combination with the main frame of the plunger provided with recesses in its sides, of side wings provided with loops to enter said recesses, pins to pass through said loops and recesses and hinge the wings to the frame, front flanges on the wings to overlap the front end of the plunger-frame, and a top
55 flange to overlap the top of the frame, substantially as described.

5. The combination with the main frame of the plunger, of the top wing or shutter provided with loops on its under side, a pin passing through the plunger-frame and said loops, to hinge the top wing to the frame, a spring for normally holding the front end of the wing raised, and loops on the under side of the top wing entering recesses in the top of
65 the plunger-frame and adjustably secured therein to limit the upward movement of the top wing, substantially as described.

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