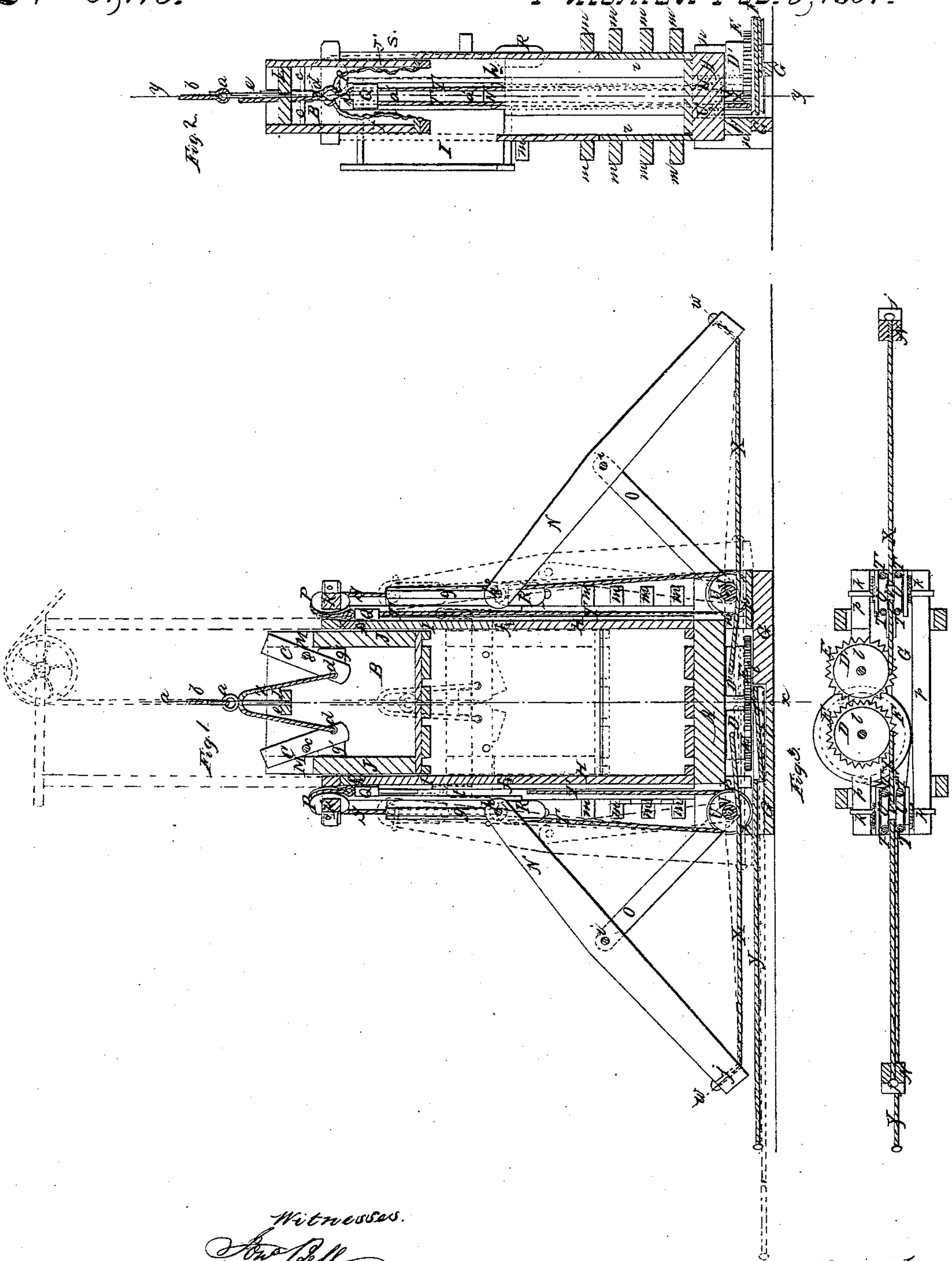


F. F. Cornell, Jr., Hay Press.

N^o 61,718.

Patented Feb. 5, 1867.



Witnesses.
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AND EDWIN M. WIGHT.

Letters Patent No. 61,718, dated February 5, 1867.

IMPROVEMENT IN BALING PRESS.

The Schedule referred to in these Letters Patent and making part of the same.

TO ALL WHOM IT MAY CONCERN:

Be it known that I, FREDERICK F. CORNELL, Jr., of the city, county, and State of New York, have invented certain new and useful improvements in Baling Presses; and I do hereby declare that the following is a full, clear, and exact description of the same, reference being had to the accompanying drawings, making part of the specification.

The objects of my invention are, first, to provide in a beater baling press, a new and convenient method of using the beater as a follower and head-block in combination with toggle-levers located at the sides or ends of the press box, when their shanks or movable ends work upward during the process of compressing the material in the press-chamber; second, a new and convenient method of forming a close packing chamber throughout its entire length, when the follower is operated by means of beams or arms, or their equivalent, projecting into or through the framing of the sides of the press in order to make a connection with the compressing power; third, a new and convenient method of operating automatically the beams or arms by means of which the combined beater and follower, though allowed to move freely when performing its functions as a beater, is held in firm connection with the compressing power when used as a follower; fourth, a new and convenient method of connecting the ends of toggle-levers located at the end or side of a baling press, with the power used for operating them by means of which their motions shall at all times be simultaneous and in the same plane; and, fifth, a new and improved arrangement of toggle-levers outside of the press framing, in relation to their position as to the other portions of the press. In the accompanying drawing—

Figure 1 is a longitudinal vertical elevation of a beater baling press taken in the line *y y* of fig. 2.

Figure 2 is a transverse vertical section taken in the line *x x* of fig. 1.

Figure 3 is a horizontal cross-section taken in the line *w w* in fig. 1.

The same letters are used in reference to the same parts in each of the figures.

Before describing the mode of construction of my improved beater baling press, and of such portions as may also be advantageously used in other forms of construction and arrangement, I would remark that the modes of constructing beater baling presses may be classified under three divisions, which will accurately define the character of all those in use previous to this, my invention, viz:

1. Those which use the beater as a head-block, and compress by a follower moved upward by a supporting power operating under the press framing.
2. Those using the beater as a follower and drawing or forcing it down for the purpose of compressing the bale by a power moving in the same direction; and
3. Those using a suspended follower in combination with a beater used as a fixed head.

The first was the primary mode of construction, and the third has in all its forms been already secured to me by Letters Patent of the United States, reissue No. 2,101, A. D. 1865, and I now desire to secure the use of a beater as a follower when the power operates in an opposite direction from the motion of the beater.

In constructing this new form of press, I securely frame together the ground sills *G G* and bed-pieces *A*, by means of the intermediate blocks *p p p* and side supports *n n n n*, leaving the space in the centre occupied by the drums *D D'*, and their gearing *E E*, and the pulley *F*, and at the ends by the sheaves *U U U U* and *V V*. Upon the said bed-piece *A* I construct an ordinary beater press frame with bale doors at the bottom at *r r*, and feed door at convenient height, and with slides for beater, as shown extended in dotted lines of fig. 1. In this press-box I place a beater, *B*, of ordinary construction, but with a slot on its upper face, running longitudinally through the centre thereof, of any required depth to fit the tilting bars *C C*, and with a cross-beam, *L*, framed into the sides *J' J'* of the beater *B*, in such position that when the bars *C C* are turned on the bolts *c c* by drawing on the rope *Z*, their ends *d d* will press firmly against it; the slot *M M* being of such depth at the ends of the beater that the bars *C C* then assume a horizontal position with their outer ends extending through into the sides of the press frame so as to engage with the compressing power, as will be hereafter explained. A recess is left in the interior of said beater of such shape that when there is no pressure on the outer ends of the bars or lifting power applied to the inner ends, the weight of said inner ends, aided by the counterpoise weights *g' g'*, will cause them to fall into said recess as they tilt loosely on the bolts *c c*, thus swinging the outer ends within the outside of the ends of the beater *D*. To the cross-beam *L*, a rope may be attached in any convenient form for

the purpose of operating the beater by any usual mechanism. At the ends of the press-frame, for the purpose of compressing the material in the press-box after the filling has been performed by the beater, I locate the levers *NN*, which are supported on movable fulcrum pins *ii* by the radii *OOOO*, whose lower ends play loosely upon the bolts *kk*, which bolts have their ends firmly secured to the bed-plate at such a distance from the framing as will enable the radii to be elevated to a perpendicular position. Upon each of these bolts, between the feet of the radii are placed three sheaves, two large, *UU*, and one small, *V*, the smaller between the two larger. In the upper ends or shanks of the levers are placed lifting bolts or pins *hh*. Between the posts of the frame of the press, in suitable grooves or slides *tt*, as shown in fig. 1, are placed, one on each side, the draw-heads *QQ*, which move freely up and down in the same a distance equal to the draw on the follower in compressing the bale. Next to said grooves or slides, on either end of said draw or cross-heads, are attached pendent ropes or chains *TTTT*, which pass down the outside of the lining, but within the framing of the press-chamber until they reach the sheaves *UUUU*, around each of which the rope or chain corresponding to it in position is passed, and thence carried up and attached to the lifting bolts or pins *hh*, one on each side of the shanks of the levers, said rope or chain *TT* being of such length as will allow the draw-heads when the levers are in position to commence moving up for the purpose of compressing the bale, to stand in the extreme upper part of the slides *tt*. I control the movement of the upper ends of the levers, so that they shall be compelled to move in parallel lines, by extending the lifting pieces or bolts *hh*, into slides *gg*, attached outside of the press frame or in any position best suited to the form and proportions of the press when constructed. Also to the centre of the upper face of the draw-heads *QQ* I attach lifting cords *SS*, which pass over their corresponding sheaves *PP*, situated so as to allow the cords *SS* to lift in a vertical line when drawn upon by the weights *RR*, which are attached to the other ends of the lifting cords, and are delivered from the sheaves *PP* in such position as to secure them against interference with the working of the other parts of the press, the caps *KK* being used in this connection only to show the ropes in position in the absence of the slides for the beater, to which in practice they could be conveniently attached. To the lower ends of the levers *NN* I attach the ropes or chains *XX*, the other ends of which are attached to their corresponding drums *DD'* at their upper edge, as shown in fig. 1, and which ropes or chains pass between the sheaves *UUUU*, and under the sheaves *VV*, which last are to prevent any rubbing against the bolts *KK*. The drums *DD'* turn loosely on the bolts *ll*, which are secured to the lower framing of the press in such position that the inner faces of the drums each nearly touch a right line drawn through the points of attachment of the ropes or chains to the levers; on the lower edge of the perimeter of each of the drums *DD'*, I place cog-gearing *EE*, that on one meshing into that of the other with equal number of teeth in each, and to one of said drums, on its lower face, I attach a driving-pulley or wheel, *F*, on which I wind the rope to be carried to the power by which the drums through this connecting gearing are made to revolve in opposite directions, winding the chains or ropes *XX* on their perimeters, and so drawing the levers *NN* into a vertical position. I have before said that the connection between the compressing power and the beater is made by means of the ends of the bars *CC* extending into or through the sides of the framing of the press, and in consequence a slot in the lining of the press would be necessary to allow motion to the follower in compressing. These slots, both in presses in which it is placed above the bale mould as in the various forms of the beater press, where the beater is used as a follower, and in those in which it is placed below the mould, as in all those operated by levers located at the sides or ends of the press framing, except as in those modes of construction heretofore secured to me by Letters Patent, are found to be objectionable, and to remedy this otherwise defect in this style of construction, and to obtain for it, in part at least, the advantages secured by my patent issued heretofore on close press-boxes formed by travelling sides or rods, I have formed a removable side, which, when the bale is being filled, will, if in position, form a close press-box; but, which, when the bale is to be compressed, may be so far withdrawn as to leave a slot for the projecting ends of the follower to move freely through the lining of the press. To accomplish this end, I form movable sections of the lining of the press-chamber *HH* at *II*. On their upper and lower edges I make tongues which move and fit in suitable guards or grooves, as seen at *ffff* in fig. 1. The inner edge of this movable section is at the further side of the slot, and the section extends over the rest of the face of the press-chamber to its outer edge, where it may be provided with suitable handles to draw it out, as is shown in fig. 2, in which case the slot is left entirely open. I do not confine myself to this peculiar mode of construction of the removable sides, as it will be readily seen that they can be made to move upward or downward, and yet answer the same end.

Having thus stated the general principles of construction and position of the parts, I will now briefly describe the mode of operation: The levers being down, as shown in fig. 1, and the draw-heads *QQ* in position at the tops of the slides *tt*, and the press-box closed, the material is put into the chamber and packed by the beater in the ordinary manner until the box is filled to such a height that the ends of the beams, bars, or arms *CC*, will, when drawn into a horizontal position, fit loosely under the said draw-heads. When filled to this point, the removable sides *II* are drawn out so as to expose the slot in the lining *a'*, shown in fig. 2. The operator now draws on the rope *Z* until each of the ends *dd* are brought against the cross-beam *L*. The rope *V*, which is now wound around the pulley *F* as many times as it will take revolutions of the drums *DD'* to wind up the chains *XX*, is then drawn upon by the power which operates the press, causing the pulley to revolve outward from the centre of the framing, carrying with it its attached drum *D*, which by means of the gearing *EE* causes the drum *D'* to revolve with the same rate of speed and in an opposite direction, thus winding up the ropes or chains *XX*, and drawing the lower ends of the levers *NN* inward until said levers assume a vertical position, and this mode of arrangement, while it secures uniformity of action in the levers, also insures a continuous tension in the same vertical plane, no matter how many times the ropes are wound around the drums, or how much they may draw either below or above the plane of the motion of the lower ends of the levers, which effectually prevents any undue strain upon the articulating points of the toggles or any pressure out of the

intended planes of motion. As the ends *j j* of the levers are drawn in by the ropes or chains *X X*, the shanks ascend, and the lifting pins *h h*, moving freely in the slides *g g*, preserve a parallel position, and at the same time carry with them the ropes or chains *T T T T*, which passing down and around the sheaves *U U U U* have the direction of their motion reversed, and by their connection with the draw or cross-heads *Q Q*, draw the same down, which last being held securely over the arms *C C* by means of their slides or guards *t t*, communicate their downward motion to them, and through them to the beater *B*, by their pressure on its ends *J J*, thus causing it to move down into the press-chamber, compressing the material therein until it assumes the position, shown in fig. 1 in red lines, the relative position of the draw-heads, levers, radii, connecting-ropes, and counterpoise weights *P P* being also all shown in similar lines. The bale may now be secured, and then removed as follows: By relieving the strain on the rope *Y*, the tension of the ropes *X X* will cause the drums *D D'* to revolve, and the rope *Y* will be again wound upon the pulley *F*, and the levers will assume their first position from their own weight, and as they descend the counterpoises *R R*, acting on the draw-heads *Q Q* through the lifting cords *s s*, will draw them upward as fast as the ropes or chains *T T T T* are slackened, and as the pressure on the ends of the arms *C C* is thus removed they will of their own weight fall inward and disconnect the beater from the compressing power, when it may be raised and the bale taken out of the bale doors *r r*, and on pushing into place the removable sections *I I* of the side linings of the press, it is ready to commence again the operation of filling.

What I claim as new, and desire to secure by Letters Patent, is—

1. The use of the beater *B*, as a follower when operated as such by the levers *N N*, located at the ends of the press.
2. The use in a baling press of stirrups or cross-heads located outside of the lining of the press-chamber, but within the framing of the press, as a means of communicating motion to the follower, when the same has arms or beams projecting through slots in the lining of the press-chamber for the purpose of forming a connection with mechanism used for compressing, located and operating at the sides or ends of the press framing.
3. The use in a baling press of toggle-levers located outside of the framing of the press, when the feet of the radii of the levers are below the plane of the top of the finished bale, and the points of connection between the upper ends of the lever, and the rods, chains, or their equivalents, connecting the same with the arms or beam of the platen, are above the said plane.
4. The use of the guides *g g* to control the motion of the levers *N N*, when operated as herein substantially described.
5. The use of the guides *t t*, cross-heads *Q Q*, ropes *S S*, and counterpoises *R R*, when used and combined for the purposes herein described.
6. Making a close press-chamber in a baling press (operated by means of a follower having arms or beams projecting through the lining thereof to form a connection with the compressing mechanism,) by means of removable sections of said lining, which, when in position render the press-box tight on all sides, but when removed, allow the said arms or beams to move freely in the openings formed thereby.
7. The removable sides *I I*, in combination with the tongues and grooves *f f f f*, arms *C C*, and cross-heads *Q Q*, substantially as and for the purposes described.
8. The levers *N N*, radii *O O O O*, sheaves *U U U U*, chains or ropes *S S S S*, cross-heads *Q Q*, arms *C C*, and follower *B*, combined, substantially as and for the purposes hereinbefore described.
9. The use in a baling press of two horizontal drums, so located under the press framing, that a vertical plane passing through the points in the ends of toggle-levers located at the ends or sides of the said framing to which the chains or ropes used for operating them are attached, will be tangent to their perimeters for the purpose of winding the said ropes or chains, and yet retaining them always in the same vertical plane.
10. The use in a baling press of the drums *D D'*, gear-wheels *E E*, driving-pulley *F*, and ropes or chains *X X* and *Y*, substantially as and for the purposes hereinbefore described.
11. The use of a hollow beater, *B*, with the arms or beams *C C*, bolts or pivots *c c*, and head-beam *L*, so constructed and arranged that the said arms, when allowed to turn freely on the bolts *c c*, will of their own weight assume a position entirely within the exterior lines of said beater, but when drawn upon by the cord *Z*, will assume a horizontal position with their inner ends held firmly by the head beam, and their outer ends projecting a sufficient distance beyond the exterior lines of the beater to engage with the mechanism used to operate it as a follower.

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Witnesses:

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