

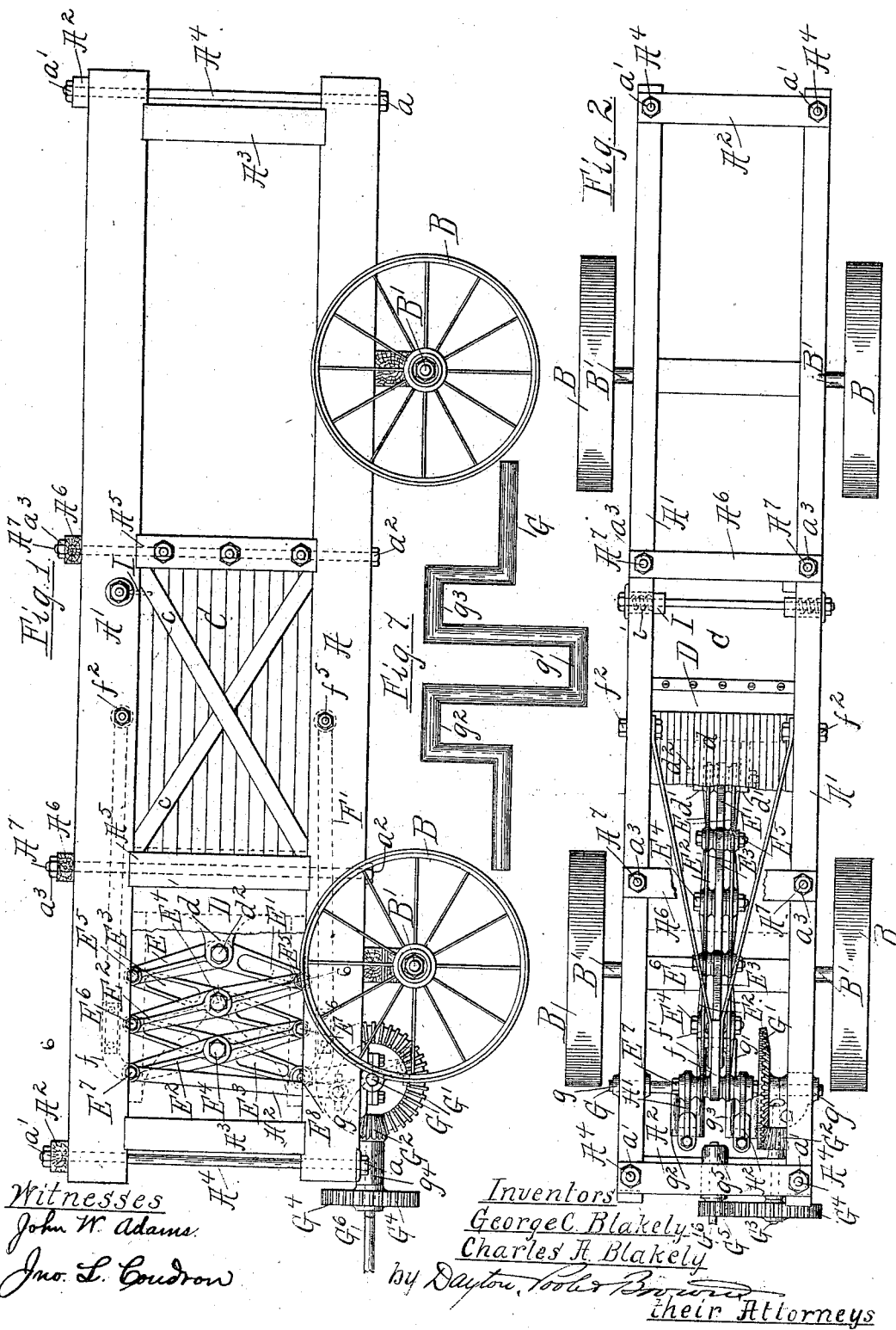
(No Model.)

G. C. & C. A. BLAKELY.
BALING PRESS.

2 Sheets—Sheet 1.

No. 513,553.

Patented Jan. 30, 1894.



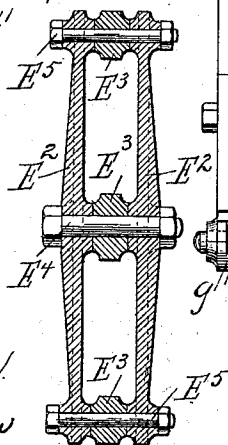
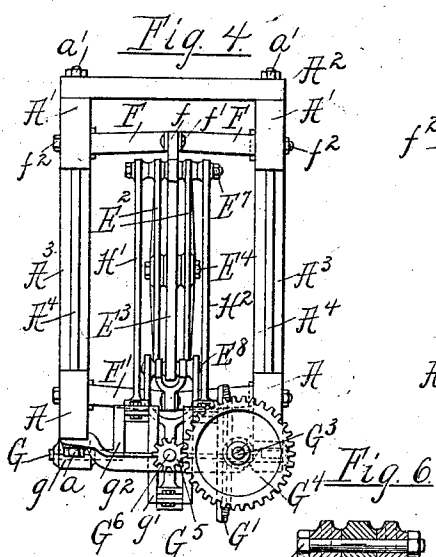
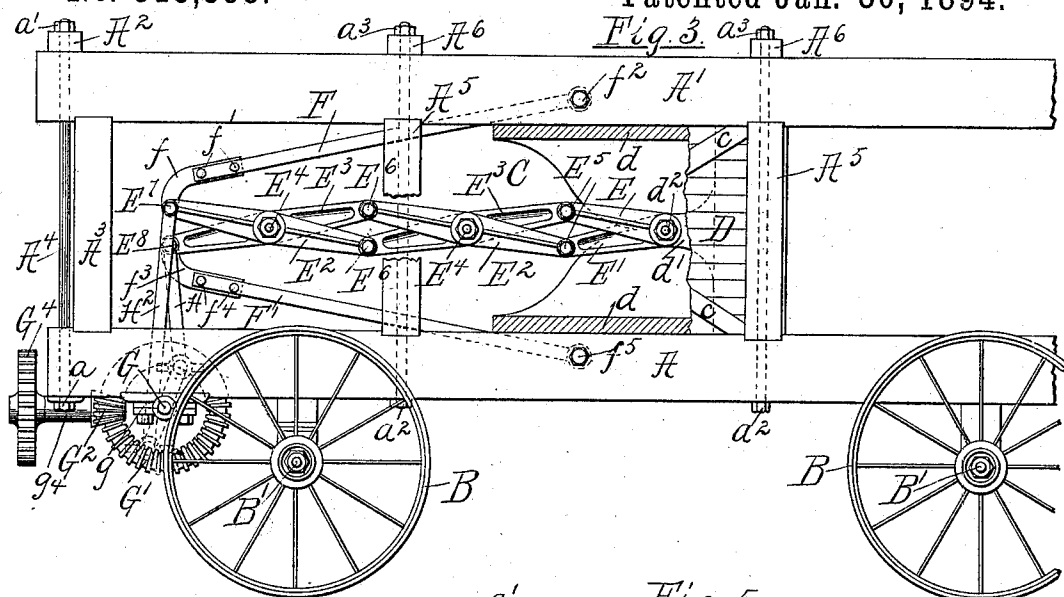
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UNITED STATES PATENT OFFICE.

GEORGE C. BLAKELY AND CHARLES A. BLAKELY, OF PLANO, ILLINOIS.

BALING-PRESS.

SPECIFICATION forming part of Letters Patent No. 513,553, dated January 30, 1894.

Application filed December 20, 1892. Serial No. 455,830. (No model.)

To all whom it may concern:

Be it known that we, GEORGE C. BLAKELY and CHARLES A. BLAKELY, of Plano, in the county of Kendall and State of Illinois, have invented certain new and useful Improvements in Baling-Presses; and we do hereby declare that the following is a full, clear, and exact description thereof, reference being had to the accompanying drawings, and to the letters of reference marked thereon, which form a part of this specification.

Our invention relates to that class of machines, known as baling-presses, which are designed to compress hay, straw, paper, rags, and various other materials into compact masses or bales, for shipment, storage, &c., and the objects of our invention are to produce a baling-press which shall be of light construction and of great working-capacity, but which shall, at the same time, possess great strength and compactness. Also, to produce a baling-press in which the forward and backward movement of the beater or compression-head shall be effected without any reversal of movement of the actuating devices, and in which the beater or compression-head shall first advance with greater speed and less power and complete its advance with lessened speed but with increased power. Furthermore, to produce a baling-press in which there shall be no possibility of lateral movement of the actuating devices, and in which also all necessity of employing auxiliary feeding devices, either of automatic or other types, shall be avoided. Still further, to provide a baling-press in which changes in speed-gearing can be readily effected without any removal of the gearing-shafts.

To the above purposes, our invention consists in certain peculiar and novel features of construction and arrangement, as hereinafter described and claimed.

In order that our invention may be fully understood, we will proceed to describe it with reference to the accompanying drawings, in which—

Figure 1 is a side elevation of a baling-press embodying our invention; the beater or compression-head being shown in its retracted position. Fig. 2 is a plan view of the same; the beater or compression-head being advanced. Fig. 3 is a side elevation of the press; the rear end-portion of the machine-frame being broken away, and the beater or compression-

head being advanced. Fig. 4 is a front elevation of the operative mechanism, in the position which the parts occupy when the beater or head is retracted. Fig. 5 is also a front elevation of the operative mechanism, enlarged; certain of the actuating gears being omitted. Fig. 6 is a transverse section of one set of lazy-tong bars, taken on the line 6—6 of Fig. 1. Fig. 7 is an enlarged plan view of the triple-crank shaft, in detached condition.

In the said drawings A, A, designate the two lower side-beams of the press-frame, these beams being shown as extending horizontally and parallel with each other throughout the length of the frame, and at opposite sides of the same.

A', A', designate the two upper side-beams of the frame, these beams being also shown as extending parallel with each other throughout the length of the frame, and at opposite sides thereof, and also as parallel with the lower side-beams A. The upper side-beams A' are shown as connected together at their ends by horizontal cross-bars A², and the lower side-beams A are shown as similarly connected together at their ends, while the upper and lower side-beams at each side of the press-frame are shown as connected together at their ends by vertical cross-bars A³ and vertical tie-rods A⁴; the latter being provided at their ends with heads a and nuts a' which securely retain the tie-rods and beams and cross-bars in their proper relative position. The press-frame is thus shown as of oblong rectangular form disposed horizontally, and, in order to render the press easily portable, it is also shown as mounted upon a suitable running-gear of which B designates the carrying-wheels; there being a front and rear set of such wheels mounted upon the front and rear axles B', as in the usual construction of running-gears. We desire it to be distinctly understood, however, that while we have shown the press as so portable, it may be a stationary structure if preferred, without departing from the essential spirit of our invention, and also that the press-frame itself may be of any suitable or preferred form of construction.

Intermediately of its ends, the press-frame is shown as further strengthened by additional vertical cross-pieces A⁵ located at the sides of the frame, horizontal cross-pieces A⁶ being located at the top and bottom of the

frame, and vertical tie-rods A^7 , being also located at the sides of the frame and having at their ends heads a^2 and nuts a^3 which securely retain these additional cross-bars and tie-rods in position.

At a point about midway of the length of the press-frame is placed or built a baling-chamber C, the sides of which are shown as braced by cross-bars c arranged in X-form, and into the open front end of this baling-chamber C enters, at times, the beater or compression-head D, which is designed to move backward and forward in the front end of the press-frame, as hereinafter more fully explained. This beater or compression-head D is preferably in the form of a single integral casting from the front side of which protrude parallel horizontal extensions d , these extensions engaging the sides of the machine and serving as guides to retain the beater or compression-head in proper position and to properly direct the movements of said beater or head. From the center of the rear side of this beater or head D extends rearwardly a pair of lugs or bosses d' and transversely through said lugs or bosses is passed a horizontal pin or bolt d^2 . To this bolt or pin are shown as pivotally connected two outer and upper lazy-tong bars or arms E and an inner and lower lazy-tong bar or arm E'; the lower ends of the upper bars E being shown as loosely surrounding the pin or bolt d^2 near its ends, and the upper end of the lower arm E' being shown as loosely surrounding said pin or bolt near its middle. Proceeding forward from this first set of three lazy-tong bars E and E', there are shown two other sets of similar lazy-tong bars E^2 , E^3 each of which is shown as consisting of two outer bars E^2 and one inner bar E^3 ; through the middles of which is shown as passing transversely a horizontal pivot pin or bolt E^4 . Each of the lazy-tong arms E^2 and E^3 is shown as of twice the length of the lazy-tong arms E and E' and as extending equal distances in opposite directions from its pivot E^4 . At their opposite ends, the intermediate lazy-tong bars E^2 are shown as pivotally connected by cross-pins or bolts E^5 , to the ends of the arms E and E', and also as connected, by similar cross-pins or bolts E^6 , to the ends of the front set of arms E^2 and E^3 . It is to be understood that there may be as many sets of lazy-tong bars or arms E^2 and E^3 , as desired, according to the size of the machine and that each set of said bars may either be composed of three members, as shown, or of any other suitable number of members. The upper ends of the outer or front lazy-tong bars E^2 , are shown as connected, pivotally, by a cross-pin or bolt E^7 , to the outer or front end of a downwardly curved arm f which is shown as bolted, as at f^7 , or which may be otherwise secured between the front ends of a pair of bars F the rear or inner ends of which are shown as pivoted, as at f^2 , to the two upper side beams A' . These two bars F are shown as converging toward

each other from their rear ends to their front ends, and as closely embracing between their front ends the arm f . The lower end of the front lazy-tong arm E^3 is shown as pivotally connected at its lower end, by a cross-pin or bolt E^8 , to an arm f^3 , this arm f^3 being shown as similar in all respects to the arm f excepting that the arm f^3 is forked to embrace the end of the lazy-tong arm E^3 and curves upward instead of downward, as does the arm f . This arm f^3 is shown as bolted, as at f^4 , or otherwise secured between the front ends of the arms F' , similar to the arms F above described; the rear ends of the arms F' being shown as pivoted, as at f^5 , to the two lower side-beams A and as converging from their rear ends to their front ends, so as to closely embrace the bar f^3 between said front ends.

Beneath the lower side-beams A, near the front ends thereof, is shown a horizontal crank-shaft G which extends transversely of the framework and is journaled at its ends in bearings g which are shown as secured to the under sides of the beams A. This shaft G is shown as formed with three crank-sections g' , g^2 , and g^3 ; the crank-section g' being located midway of the length of the shaft and intermediate of the crank-sections g^2 and g^3 , and the said crank-sections g^2 , g^3 , being shown as extending coincidently with each other and oppositely from the crank-section g' . Obviously the crank-shaft may be mounted in any other suitable manner at the front end of the machine, and may have any number of crank-sections desired. Upon one end of this crank-shaft G is shown a beveled-gear wheel G' with the teeth of which mesh the teeth of a beveled-gear pinion G^2 ; this pinion being shown as mounted upon the rear end of a shaft G^3 , so as to turn with said shaft.

We desire it to be understood that any other suitable form of gearing may be used to transmit motion between the shafts G and G^3 as desired. The shaft G^3 extends longitudinally of the machine-frame, and is shown as journaled beneath the front lower cross-bar of the machine-frame, in a bearing g^4 which is secured to the under side of the cross-bar, and as carrying at its front end a gear-wheel G^4 which turns with the shaft G^3 . The teeth of the gear-wheel G^4 mesh with the teeth of a gear-pinion G^5 which is mounted upon a power-shaft G^6 , so as to turn with said shaft; this shaft also extending longitudinally of the machine-frame, and being journaled in a bearing g^5 which is secured to the under side of the lower front cross-bar.

Power is applied, through a suitable belt and belt-pulley, to the power-shaft G^6 , from any suitable motor, and it will be readily understood that the gear-pinion G^5 and gear-wheel G^4 can be readily removed from their shafts without necessitating any displacement of said shafts; relatively different sizes of gears being substituted for the gears G^4 and G^5 when changes in speed are desired.

To the crank-section g' of the crank-shaft

G is shown connected the lower end of a connecting-rod H, the upper end of which is shown as formed with a fork *h*; the cross-pin or bolt E³ of the front lazy-tong bar E³ extending loosely through the upper extremities of the fork-arms. To the crank-sections *g*² and *g*³, respectively, are shown connected the lower ends of two connecting-rods H' and H² through the upper ends of which extends the cross-pin E⁷ of the front pair of lazy-tong bars E³. Thus it will be seen that, as the crank-shaft revolves, its crank-section *g*¹ moves upward while its crank-sections *g*² and *g*³ are moving downward, and vice versa. Consequently, the revolution of the crank-shaft causes the connecting-rod H to move upward while the connecting-rods H' are moving downward, and to move downward while said rods H' are moving upward. These relatively opposite movements of the connecting-rods H and H' cause the front end of the front lazy-tong bar E² and the front ends of the front lazy-tong bars E³ to alternately approach toward and recede from each other. Corresponding approaching and receding movements are imparted to the other lazy-tong bars, and thus, as the bars approach each other, the beater or compression-head D is advanced or moved toward the rear end of the machine-frame, and as said bars recede from each other the beater or head is retracted or moved toward the front end of the machine-frame. The action of the lazy-tong bars is such that the advancing movement begins at a greater speed and ends at a less speed, there being more power applied to the beater or head at the final than at the first part of its movement. So also with the retractive movement of the beater or head D; the first part of its movement occurs slowly and the speed gradually increases till the last part of the retractive movement has been effected.

The crank-shaft G rotates constantly in but one direction, to effect both of the reversed movements of the beater or compression-head, and consequently all racking strains upon the framework of the machine are avoided. Obviously, this rotation may be in either direction, according to the direction of rotation of the power-connections. It will also be seen that when the lazy-tong bars are exerting their greatest force, they are extended longitudinally and that the crank-sections *g*¹, *g*² and *g*³ and also the connecting-rods H and H' are all approaching their centers. Hence the strains are all borne longitudinally by these parts, and consequently the strains are most advantageously resisted by said parts. The arms F, F', also bear the maximum working-strains when extended longitudinally and effectively aid the lazy-tong bars to bear said strains. Moreover, when extended longitudinally, the arms F, F', form braces which prevent any side movement of the lazy-tong bars. It will be still further seen that no special or separate retracting devices are required for the beater or compression-head, nor is any re-

bounding of the compressed material necessary to effect its required action.

Owing to the compact character of the operative connections, a much larger or more capacious baling-chamber can be used in any given size of frame than heretofore, so that all auxiliary feeding mechanisms can be dispensed with. Owing also to the fact that the movements of the beater are at first more rapid and less powerful and toward the last are more powerful and slower, materially fewer advances of the beater are required to effectively compress the material into bale form.

In order to provide for the proper reception of such of the material as may pass above the beater during its advancing movements, a horizontal oscillatory stop-bar or cushion-bar I is shown as mounted pivotally in the rear part of the baling-chamber, the ends of the bar being shown as pivoted in the rear parts of the upper side-beams A' of the machine-frame, so that the bar shall extend transversely thereof. Spiral retracting-springs are shown as coiled around the ends of the bar I and as acting to return the bar to its normal position. When the material has been thrown into the baling-chamber, such of the material as may remain upon the top of the chamber will come upon the top of the beater, as said beater advances. The arrangement is such that as the beater advances it oscillates the bar I so as to permit this bar to yield to the upper part of the material, and when the beater recedes, the bar will resume its normal position and so retain the top layer of material.

Having thus described our invention, what we claim as new, and desire to secure by Letters Patent, is—

1. A baling press, comprising an oppositely movable beater or compression head, a plurality of lazy-tong bars operatively connected to said beater or head, a plurality of pivotal bars disposed longitudinally with relation to the lazy-tong bars and operatively connected at their ends to said lazy-tong bars, and a revoluble crank-shaft also operatively connected to said lazy-tong bars, substantially as set forth.

2. A baling press, comprising a reciprocating beater or compression head, a series of lazy-tong bars pivotally connected to said head at one end and sustained against lateral movement at the other, a crank-shaft having a plurality of crank-sections, and suitable rods connecting the lazy-tong bars and the crank-sections, substantially as set forth.

In testimony that we claim the foregoing as our invention we affix our signatures in presence of two witnesses.

GEORGE C. BLAKELY.
CHARLES A. BLAKELY.

Witnesses:

GEO. WILCOX,
S. K. DENNIS.