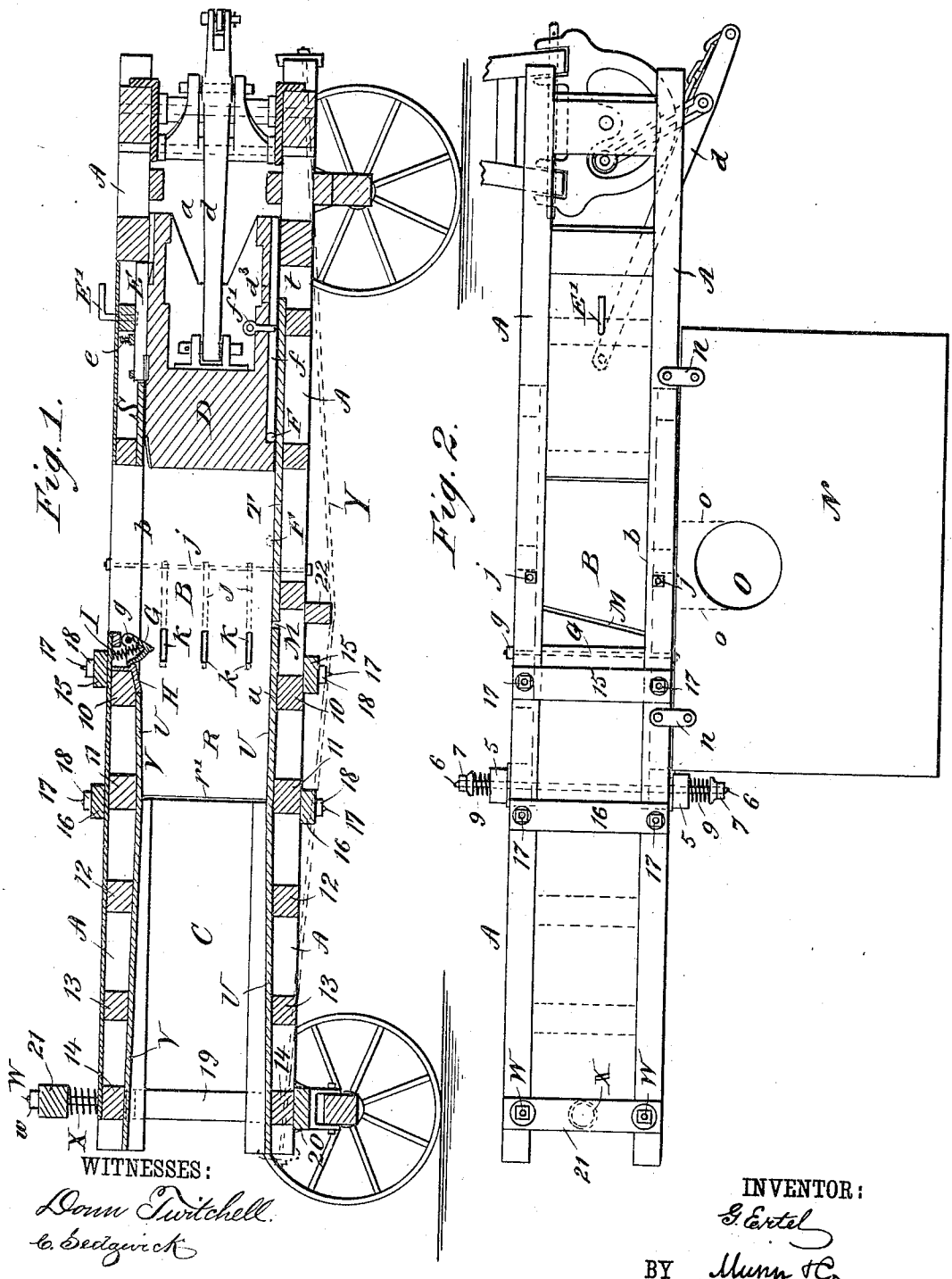
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3 Sheets—Sheet 1.

G. ERTEL.

BALING PRESS.

No. 362,884. Patented May 10, 1887.



WITNESSES:

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C. Sedgwick

INVENTOR:

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BY Munn & Co.

ATTORNEYS.

(No Model.)

3 Sheets—Sheet 2.

G. ERTEL.

BALING PRESS.

No. 362,884. Patented May 10, 1887.

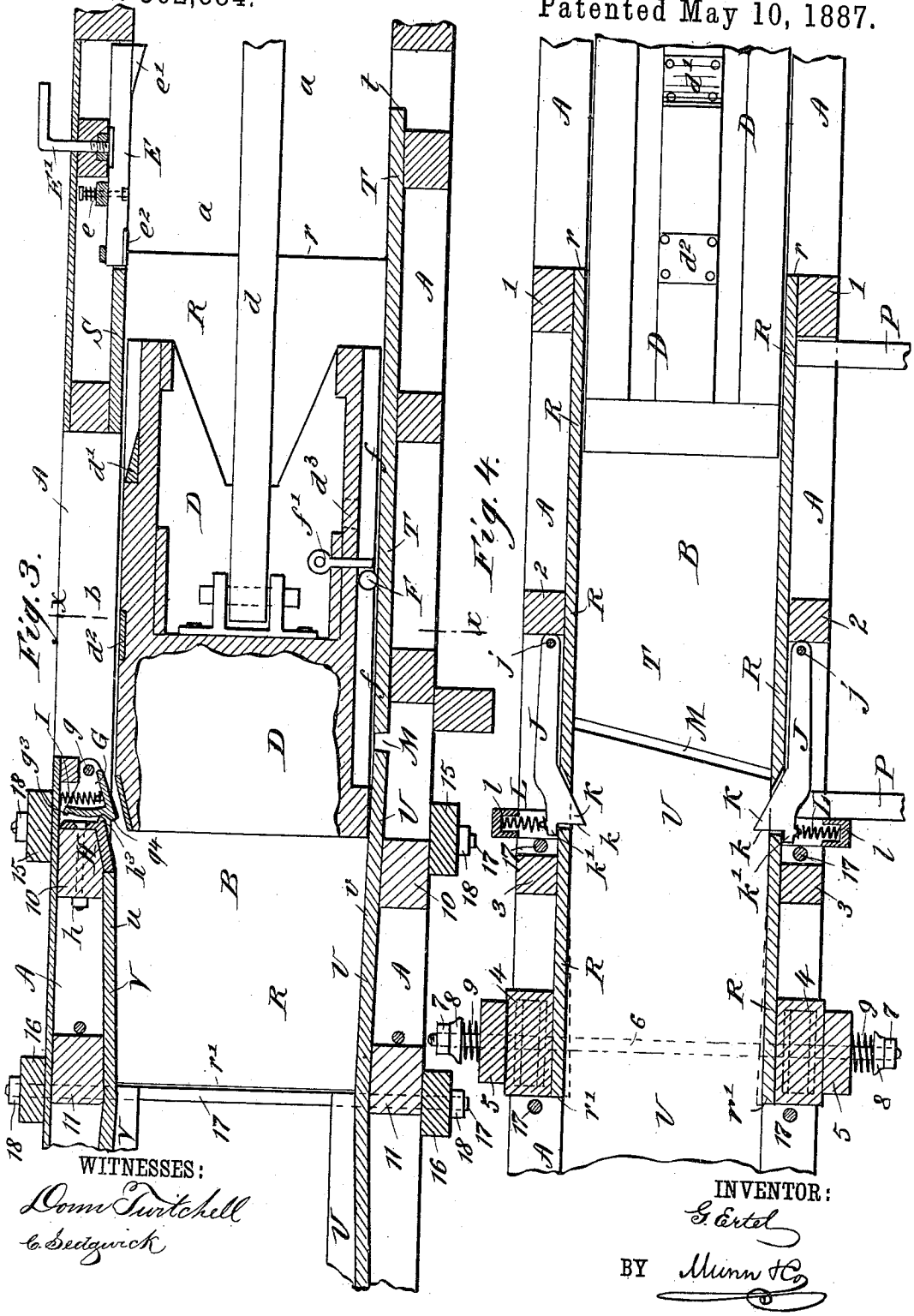


Fig. 3.

Fig. 4.

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(No Model.)

3 Sheets—Sheet 3.

G. ERTEL.

BALING PRESS.

No. 362,884. Patented May 10, 1887.

Fig. 6.

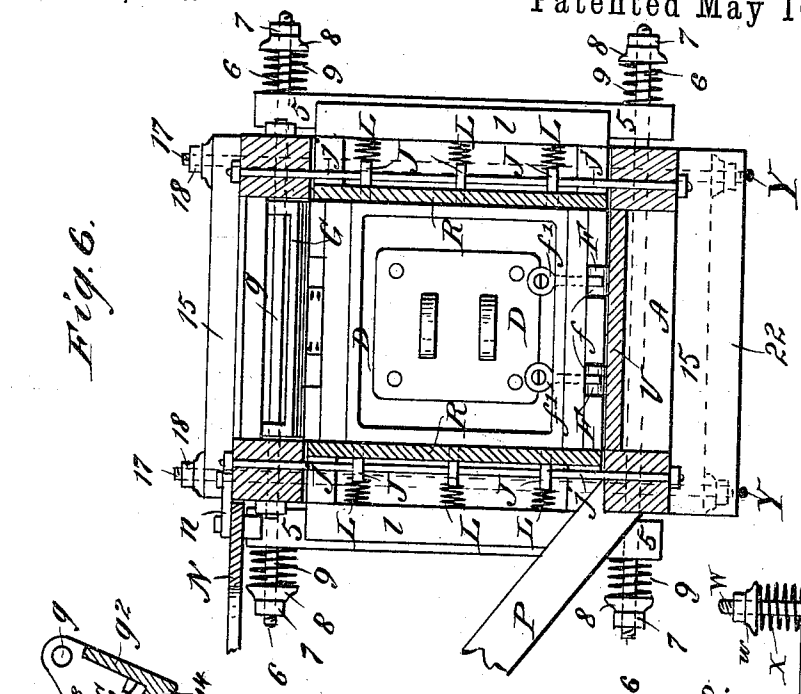


Fig. 8.

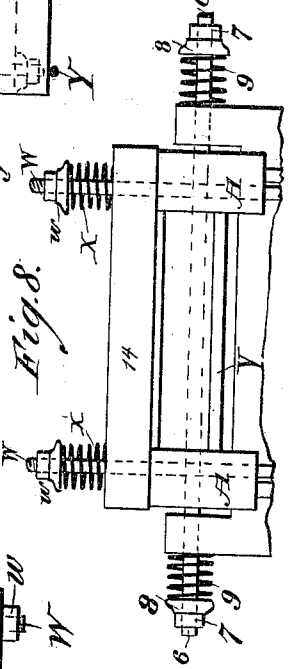


Fig. 7.

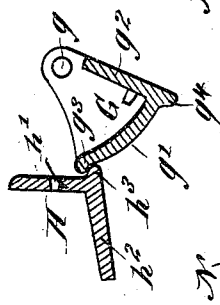
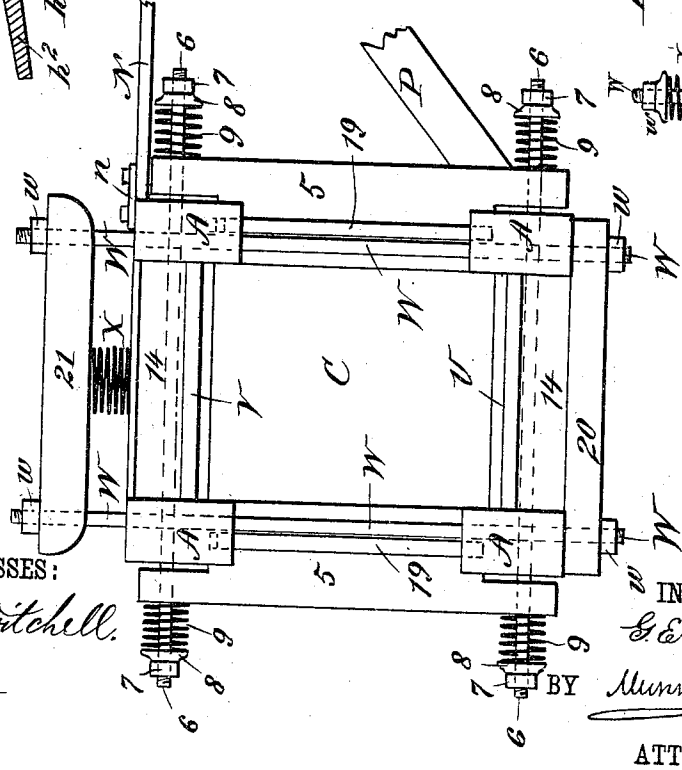


Fig. 5



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UNITED STATES PATENT OFFICE.

GEORGE ERTEL, OF QUINCY, ILLINOIS.

BALING-PRESS.

SPECIFICATION forming part of Letters Patent No. 362,884, dated May 10, 1887.

Application filed January 3, 1887. Serial No. 223,224. (No model.)

To all whom it may concern:

Be it known that I, GEORGE ERTEL, of Quincy, in the county of Adams and State of Illinois, have invented a new and Improved Baling-Press, of which the following is a full, clear, and exact description.

My invention relates to presses for baling hay, straw, cotton, or other material, and has for its object to provide a simple, effective, and durable press of this character, combining improvements allowing very easy operation of the plunger, and insuring a folding of the balable material at the rear end of the baling-box feed-opening without catching the material, thus promoting efficiency of the plunger and insuring the easier feed of the press, and finally providing for automatic adjustment of the press-case walls to accommodate varying conditions of the material being baled and a variable feed of it to the press.

The invention consists in certain novel features of construction and combinations of parts of the press, all as hereinafter fully described and claimed.

Reference is to be had to the accompanying drawings, forming a part of this specification, in which similar letters of reference indicate corresponding parts in all the figures.

Figure 1 is a vertical longitudinal sectional elevation of my improved baling-press. Fig. 2 is a plan view of the press. Fig. 3 is an enlarged vertical longitudinal sectional elevation of the central parts of the press. Fig. 4 is a sectional plan view thereof, with the feeder-platform removed and its braces broken away. Fig. 5 is a rear end view of the press-case, the feeder-platform and its braces being broken away. Fig. 6 is a transverse vertical section of the press-case taken on the line *x x*, Fig. 3, as viewed from the front or power end of the press, the feeder-platform and its braces being broken away. Fig. 7 is a cross-sectional detail view, on larger scale, of the automatic folder and adjacent stop-plate; and Fig. 8 is a detail rear end view, showing a modified arrangement of springs, with the yielding upper wall of the bale-chamber.

The main press-frame, which is formed with heavy longitudinal corner timbers, A, is supported on suitable wheeled trucks, as shown in Fig. 1, and is fitted with an interior lining, forming a case, providing a front chamber or box, *a*, for the drawn-back plunger or follower, a baling-box, B, in rear of the plunger, and a bale-chamber, C, in rear of the baling-box, and from which the pressed and tied bales are discharged as they are continuously formed between grooved spacing-blocks used in a well-known manner.

The plunger D may be operated by any approved power mechanism, that shown being described and claimed by me in a prior patent, No. 336,305, dated February 6, 1886; hence it is only necessary here to state that as the plunger-pitman *d* is carried past the longitudinal center line of the press-case on the extreme forward stroke of the plunger the latter rebounds and is clamped automatically at the top and pressed to the floor of the case to prevent violent shocks to the case and the power mechanism by means of a brake-lever, E, which is hung to the top of the press-case on a spring-actuated fulcrum pin and block at *e*, and has a wedge-block, *e'*, and a metal plate, e^2, which act, respectively, on an inclined block, *d'*, and plate d^2 on the top of the plunger.

A vertically-adjustable fulcrum and thrust-pin, E', is fitted into a cross-timber of the press-case and may be set to regulate the pressure the brake-lever will exert on the rebounding plunger. This brake-lever mechanism is described in my prior patent, No. 349,934, dated September 28, 1886, and therefore needs no further detailed description, and is illustrated here as a preferred form of brake or clamp acting on the back end of the plunger in connection with a novel arrangement of anti-friction rollers placed loosely between the plunger and the floor of the press-case, as next described. I employ, by preference, two of these rollers, F F, which are placed loosely within longitudinally-ranging grooves, *f f*, in the bottom of the plunger, and are arranged to support the plunger clear of the floor of the press-case during the greater portion of the travel of the plunger, or until on its backward or outward stroke the plunger is clamped to the floor of the press-case by the brake-lever E, and until on the forward or acting stroke of the plunger it is forced to the floor of the press-case by an automatic folder, G, which operates also as a resistance-bar, as presently described. It is obvious that a single roller F may be placed beneath the

plunger; but the two shown are preferred; and whether one or two or more rollers are used I will provide pins f' in the base of the plunger, which project into the roller-grooves behind the rollers to prevent their backward displacement; and I also make openings d^3 in the plunger-base, through which the rollers may be easily removed after the pins f' are withdrawn.

The folder G is a metal block or angular plate, which is pivoted on a heavy bolt, g, at the upper wall of the press-case at the rear end of the feed-opening b of the press, and so that the angle formed by the meeting of its two parts or faces, g' g^2, normally projects within the baling-box B, as shown in Fig. 1 of the drawings, in which position the folder is held by contact of a lip or lug, g^3, at the upper edge of its part g', with a projecting lip, h^3, at the corner of an angular metal plate, H, which is held to the press-case next the folder by bolts h, and is formed, preferably, of two parts or united plates, one, h', ranging vertically, and the other, h^2, which inclines or slants downward at its under face from the lip or lug h^3, toward the rear part of the baling box. A spring or springs, I, placed between the folder and the outer lining of the press-case, assure the normal pendent position of the folder, which thus offers resistance to the hay or other substance being fed to the press-box or forced along it by the plunger to fold the hay down into the baling-box in advance of the plunger. A lip, g^4, at the corner of the folder strikes the lip h^3 of the plate H to limit the upward swing of the folder as the plunger moves beneath it to the extreme of its forward stroke, and the outer face of the part g' of the folder is formed on an arc described from the folder-pivot as a center, and consequently will always move closely to the edge of the lip h^3 of the plate H as the folder is swung upward by the plunger, and whereby the hay or other material being baled will be prevented from passing up behind the folder and catching between it and the press-case or the plate H fixed thereto to impede the operation of the plunger. This folder G somewhat resembles the retainer T shown in my Patent No. 349,934, dated September 28, 1886; but the retainer T is liable to catch the material being baled between it and the press-case, and I would remark that this is an instance where a difference in form effects vastly improved results in practical operation. Both the holder G and plate H extend for the full width of the press-box. It will be understood that the plate H is not essential to the successful operation of the folder G, as the top cross-timber of the press-case next the folder may be provided with a lip the substantial equivalent of the one h^3 on the plate H, and against which the folder-lips g^3 g^4 may stop, and next which the convexed face of the part g' of the folder may move; or the folder-lips g^3 g^4 may stop against a corner of the press-case timber, which may itself act as does the lip h^3 on the plate H. This part H, however, forms an effective wear-plate or guard to protect the timber of the press-case next the folder, and therefore its use is preferable.

Retainers J are pivoted on vertically-ranging rods or shafts j at each side of the press-case, and have lugs or hooks K, which project through the case into the baling-box, and so that the forward shoulders, k, of the hooks which receive the back thrust or pressure of the expanding hay or other substance last pressed by the plunger stand about in line vertically with the folder G, which latter also assists or may assist the retainers by its corner lip, g^4, in preventing undue expansion of the pressed material as the plunger moves backward prior to feeding the next charge of hay to the baling-box. Springs L, placed between the backs of the retainers J, behind their hooks K, and entering suitable supports, l, fixed to the press-case, normally force the hooks into the baling-box, but allow them to be thrust back by pressure of the plunger until the charge of hay passes the hooks, which then spring in to retain the hay.

It will be noticed that the pivot-rods j of the hook-retainers J are placed at the forward ends of the retainers, or nearest the drawn-back plunger, and that the hooks have lips or lugs k' which press against the outer faces of the side walls of the press-case with great force, as the hay in expanding presses against the hook-shoulders k, and both the hooks K and the pressing inner faces of their lugs k' stand in planes nearer the center of the press-case than the pivot-rods j of the retainers; hence the greater the pressure of the expanding hay against the hooks the greater will be the bracing effect of the hook-lugs k' on the press-case to prevent bursting or overstraining of the case at the baling-box, and the retainers are not liable to slip or lose hold of the pressed hay, as they are when their pivots are arranged at their ends farthest from the drawn-back plunger, as shown in prior patents granted to me.

The floor of the baling-box B is provided with a dust-exit and bale-cleaning transverse or diagonal slot, M, which is also particularly described and claimed in my aforesaid Patent No. 349,934.

The operation of the plunger with relation to the back clamp, the automatic folder, and the retainers is as follows: When the plunger is fully back, as in Fig. 1 of the drawings, a charge or increment of hay or other material to be baled will be fed to the baling-box B, and as the plunger is forced forward for its effective stroke by the power mechanism the weight of the plunger will be sustained on the rollers F, which thus hold the plunger clear of the floor of the press-case, so that it moves to its work with very little friction. As the plunger-head approaches the folder G, and about when the freely-moving rollers reach a position indicated in dotted lines in Fig. 1 and in full lines in Fig. 3, the weight of the head or

forward end of the plunger, together with the resistance offered by the folder G, will overbalance the plunger forward on the rollers, so that the forward end of the plunger is forced to the press case floor and the friction-rollers are relieved of heavy pressure as the plunger is being forced forward under maximum power of the driving mechanism to the extreme limits of its forward stroke, or to the position shown in Fig. 3 of the drawings. As the head of the plunger forces the hay inward beneath the folder G, which has also been raised, as in Fig. 3, by the pressure, the hay above the lip g^4 of the folder is bent or folded over by said lip, and as the folder swings upward the closeness of its part g' to the adjacent lip, h^3, of the plate H prevents passage of the hay behind the folder. Consequently all the hay will freely pass rearward into the baling-box beneath the folder and will not bind the plunger. Neither can the hay as it expands when the plunger is thrown backward on its return stroke force its way behind the folder or between the folder and the plate H or the press-case; hence the succeeding charge of hay next pressed into the baling-box by the plunger will easily force the last-pressed charge rearward into the press-case on the next effective or forward stroke of the plunger. As the outer end of the plunger-pitman passes the center, or, in other words, when the end of the plunger-pitman connected to the power mechanism is carried past the transverse center of the press-case, the plunger is forced backward toward its first position by the expansion of the pressed hay. The retainer-hooks K will catch the hay and limit its expansion, and the expanding hay also will operate to swing or turn the folder G downward to its first position ready for operation on the next forward stroke of the plunger, and the folder also will operate as a retainer to hold back the pressed material, although it is intended that this will be done chiefly by the retainers J K, to relieve the folder of excessive strains. When the plunger on its back-stroke escapes from beneath the folder G, the springs I will instantly swing the folder down on its pivot g to the position shown in Fig. 1 of the drawings, and the lip g^4 will fold the loose straggling material down into the baling-box prior to the pressing of the next batch of material by the plunger, the folder thus assuring smooth-sided bales and permitting quick and effective working of the press without requiring a door at the baling-box opening, thereby saving time and labor in pressing the bales.

Immediately the plunger pitman passes the center and the expanding pressed material throws back the plunger D, the latter, after escaping from beneath the folder G, will again be free, and will bear onto the anti-friction rollers or carriers F, which will support the plunger and assure its very easy and smooth travel, and with little friction and wear, until the rollers nearly reach the position shown in full lines in Fig. 1, and about as the plunger overbalances backward on the rollers it will be clamped at its back end by the brake-lever E (or other devices suitable for this purpose) to the floor of the press-case, to prevent shocks to the power mechanism and other parts of the press, and the rollers F will be relieved of considerable of the weight of the plunger and its pitman.

On the next forward stroke of the plunger, and immediately it is moved from beneath the brake-lever or clamping device, as E, the plunger will again be supported clear of the floor of the press-case on the anti-friction rollers F until it overbalances forward about as, or shortly before, it reaches the folder in pressing the last-fed charge of hay or other balable material. Should the rollers F cause too free or easy travel of the plunger, as at times may occur in extremely dry weather and when baling very dry material, it is the work of a few minutes only to withdraw the pins f' from the plunger, and remove the rollers from beneath the plunger through the openings d^3 therein, and the rollers may easily be replaced beneath the plunger when necessary.

To promote convenience in feeding the press, I provide the platform N, which is held to the press-frame, with an opening, O, adjacent to the feed-opening b of the press case. This construction, instead of compelling the feeder to stand upon the platform to feed the hay to the press by forking it, or compelling the feeder to stoop or crouch upon the platform when feeding the press directly by the hands, allows the feeder to stand upon a support placed below the platform—a few bales of hay, for instance—and with his body through the opening O of the platform, which will be about level with his waist, thus allowing the feeder by an easy movement of his arms or hands to sweep the hay or other substance from the platform directly into the feed-opening of the baling-box, and which he may do for a long time without fatigue, thus effecting a considerable saving in labor over the other above-named methods of feeding the press. The opening O is preferably made round and near the inner edge of the platform; but it may be cut in from the edge, as indicated by the dotted lines o o in Fig. 2 of the drawings.

The feeder-platform N may be held to the press-frame in any approved way, a preferred plan being by means of links n n, which connect it to and about level with the top corner timber of the frame of the press-case, and braces P, which give support to the outer edge or part of the platform from the lower corner timber of the case.

The two opposite side walls, R R, at the forward or power end of the press-case extend rearward from points r, next the plunger-brake device E, or its equivalent along the baling-box B, to points r', whence the sides of the press are open to its back end to allow "tying out" the bales. A short roof or top wall, S, is arranged over the plunger in front of the feed-opening b of the press case, and the floor

T, on or along which the plunger travels, extends from a point, *t*, rearward to the dust-exit slot M, and the rear floor-section, U, reaches from the slot M, or from a point about beneath the folder G, to the back or bale-discharge end of the press. The upper wall, V, of the baling box and chamber extends from the folder G, or from the plate H, to the back end of the press.

The sides R R of the press-case are bolted or nailed securely to opposite pairs of upright timbers 1, 2, 3, and 4, which are framed into the corner timbers, A, and the joints of the timbers 4 or 3 and 4 allow play in the frame-timbers A laterally of the press-case. (See the dotted lines at the timbers 4 in Fig. 4 of the drawings.) At opposite sides of the case, outside of the timbers 4 4, there are placed blocks or timbers 5 5, one at each side of the case, and through the blocks 5 and timbers 4 there are passed bolts 6 6, having threaded ends, onto which heavy nuts 7 7 are fitted outside of washers 8 8, between which and the timbers 5 5 springs 9 9 are placed, these springs preferably being spiral springs encircling the bolts. It is obvious that by tightening and loosening the nuts 7 the rear parts of the side walls or linings R R will be drawn toward each other more or less or slackened off, to cause lateral contraction or expansion of the space forming the rear end of the baling-box B. Usually I will tighten the nuts 7 until the press sides R R are drawn in at their ends *r'*, as indicated in dotted lines in Fig. 4 of the drawings. The forward part of the sides R at the extreme forward end of the baling-box B will yield more or less to accommodate the varying nature and condition of the material being pressed, while offering resistance to the plunger to insure proper density of the pressed bales, although this result is assured partly by the fixed converging rear ends of the lower and upper walls or linings U V of the press-case, which are arranged with the press-frame, as next described. These walls or linings U V are nailed or otherwise secured to opposite pairs of timbers 10, 11, 12, 13, and 14, which are framed into the corner timbers, A, of the press-case. Outside of the timbers 10 and 11 there are placed opposite pairs of cross-timbers 15 16, respectively, through which pass heavy bolts 17 17, having nuts 18, which are drawn up snugly to the timbers 15 16, and prevent vertical expansion of the press-frame and the walls or linings U V of the press-case at the rear end portion of the baling-box.

The inner faces of the timbers 10, 11, 12, 13, and 14 are dressed off, so that the timbers 11 are thickest and those 10 are thinner, to cause the forward parts, *u v*, of the linings U V to flare or diverge toward the plunger or converge rearward at the rear end of the baling-box B, and these relatively-fixed parts *u v* of the linings will assure sufficient density of the material pressed by the plunger were the rear parts of the side linings, R R, not drawn inward or made adjustable, as above described.

The face dressing of the rearward timbers, 12, makes them thinner than the thickest timbers, 11, and the timbers 13 are made thinner than those 12, and those 14 are thinner than the ones 13. Consequently the interior of the press-case at the bale-chamber C and from the timbers 11 to the extreme rear or discharge end of the case gradually enlarges in size, as shown in Fig. 1 of the drawings. The pressed bales are tied at the open opposite sides of the bale-chamber C when they pass beyond the side linings, R, of the press-case. The outer faces of the dressed timbers 10, 11, 12, 13, and 14 are about flush with the outer faces of the main corner timbers, A, of the press-frame. Two side timbers, 19 19, which range vertically, are let into mortises in the timbers A, near their rear ends, and the mortises are deep enough to allow vertical play of the upper part of the press-frame with its series of cross-timbers and attached lining V.

Below the lower cross-timber, 14, there is placed a timber, 20, through the opposite ends of which and the frame-timbers A and an upper cross-timber, 21, are passed two bolts, W W, having nuts *w w*, which are outside of the parts 20 and 21; and between the timber 21 and the upper rear cross-timber, 14, there is placed a strong spring, preferably a spiral spring, X, which normally expands and presses the rear upper part of the press-frame and bale-chamber lining V, and whereby the rear end of the bale chamber C is made automatically adjustable in area, and its size is controlled by the pressure or resistance of the spring. If desired, two springs, X X, may be used—one placed on each of the bolts W W between nuts and washers *w w* and the outer face of the cross-timber 14, as shown in Fig. 8 of the drawings—and with like results; but the construction first described, with one central spring, X, is at present preferred.

It is obvious that by setting the nuts *w* on the bolts W in a manner to hold the yielding upper wall of the bale-chamber C to approximately suitable positions for pressing any grade of hay, straw, cotton, or other material, whether wet or dry, the spring or springs X will allow automatic adjustment of the walls or size of the bale-chamber to offer the proper resistance to the passage of the material, should its condition or the quantity fed to the baling-box at each charge prior to successive strokes of the plunger vary; hence tightening or loosening of nuts on the press-frame is not required, thus allowing the press to be operated effectively and without delays by ordinary farm-hands, and without danger of overstraining or breaking the machine.

I am aware it is not new to apply spring-pressure to yielding walls of the bale-chamber of a continuous baling-press; but I am not aware of a construction such as I herein show and describe. It will be noticed that in my press the bale-chamber from the rear end of the baling-box at *r'* rearward to its back end is entirely open at the sides between the upper

and lower opposite corner timbers of the press-frame, and the bales, emerging without obstruction from the baling-box B into the bale-chamber C, are confined between the lower and upper walls, U V, and so much of the inner side faces of the corner timbers, A, as projects vertically beyond these walls at the sides of the chamber. Hence the friction-surfaces of the bale-chamber over which the bales are forced by the plunger never vary in area, however the top and bottom of the press are adjusted or held by the spring or springs X, and there are no slots or open corner joints into which the pressed material would be forced to bind and clog the press, as when side walls are used with expansible top and bottom walls. Furthermore, the opposite somewhat-loose side timbers, 19, near the back end of the press-case, hold the top and bottom walls in proper relative positions, while allowing free adjustment of the walls; and I find by practical tests that my construction of the bale-chamber without side walls, as above described, allows the nuts *w* of the retaining-bolts W to be tightened or loosened easily and quickly by a twelve-inch wrench, even when the pressure of the plunger is from eight to ten tons; and, finally, the construction with corner timbers, A, walls U V, and the cross-bars and bolts and nuts W *w* is quite inexpensive and very substantial and durable.

Truss-rods Y, connected to the ends of the lower frame-timbers, A, one at each side, are strained over a cross-timber, 22, on the frame below the baling-box B, to give rigidity to the entire structure.

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

1. The combination, with the press-case and a plunger fitted therein, of a roller or rollers placed loosely between the plunger and the floor of the case, substantially as described, for the purposes set forth.

2. The combination, with the press-case and a plunger fitted therein and provided with grooves, as *f*, in its lower surface, of a roller or rollers placed loosely in said grooves on the floor of the case, substantially as described, for the purposes set forth.

3. The combination, with the press-case, a plunger, as D, fitted therein, and rollers, as F, placed loosely between the plunger and the floor of the case, of removable roller-retainers, as *f'*, fitted in the plunger, substantially as shown and described.

4. The combination, with the press-case, a plunger, as D, fitted therein and having roller ways or guides at its lower surface, of rollers, as F, placed loosely between the plunger and the floor of the case, and said plunger provided with openings d^3, through which the rollers may be removed, substantially as shown and described.

5. The combination, with the press-case, a plunger, as D, fitted therein, and loose rollers, as F, placed beneath the plunger, substantially as specified, of a clamp or brake device fitted to the top of the press-case, substantially as described, whereby as the plunger overbalances backward on the loose rollers it will be forced by said clamp or brake to the floor of the press-case, as and for the purposes set forth.

6. The combination, with the press-case, a plunger, as D, fitted therein, and loose rollers, as F, placed beneath the plunger, substantially as specified, of a clamping device fitted to the top of the press-case and comprising a brake-lever, E, hung to the case and provided with inclined and flat clamp-faces adapted to corresponding plates on the plunger, and a pressure-regulating fulcrum, E', to said lever, substantially as described, for the purposes set forth.

7. The combination, with the press-case, a plunger, as D, fitted therein, and loose rollers, as F, placed beneath the plunger, substantially as specified, of a resistance-bar placed at the rear end of the baling-box feed-opening, substantially as described, whereby, as the plunger approaches the limit of its forward stroke, it will, while overbalanced forward on the rollers, be forced by the resistance-bar to the floor of the press-case to relieve the rollers of excessive pressure, substantially as herein set forth.

8. The combination, with the press-case, a plunger, as D, fitted therein, and loose rollers, as F, placed beneath the plunger, substantially as specified, of a pivoted folder positioned at the rear end of the baling-box feed-opening, substantially as shown and described, whereby the folder will force the forwardly-overbalanced plunger to the floor of the press-case and will simultaneously fold the material being pressed within the baling-box, as and for the purposes set forth.

9. The combination, with the press-case, of a folder, G, pivoted at the rear end of the baling-box feed-opening and provided with an outer face, g^2, which folds the material being baled, and an inner or forward face, g', coacting with the press-frame or a lip thereon to prevent passage of the material between the folder and the press-frame, substantially as shown and described.

10. The combination, with the press-case, of a folder, G, pivoted at the rear end of the baling-box feed-opening and formed with faces g^2 g' and a lip, g^4, at the apex of the angle formed by said faces, substantially as shown and described.

11. The combination, with the press-case, of a folder, G, pivoted at the rear end of the baling-box feed-opening and formed with faces g^2 g' and a lip, g^3, adapted to stop against the press-case or a lip thereon, substantially as shown and described.

12. The combination, with the press-case, of a folder, G, pivoted at the rear end of the baling-box feed-opening and formed with faces g^2 g' and lips g^4 g^3, said lips adapted to stop against the press-frame or a lip thereon, substantially as shown and described.

13. The combination, with the press-case, of a folder, G, pivoted at the rear end of the baling-box feed-opening and formed with faces g^2 g' and a lip, g^3, adapted to stop against the press-frame or a lip thereon, and springs I, normally turning the folder downward, substantially as shown and described.

14. The combination, with the press-case, of a folder, G, pivoted at the rear end of the baling-box feed-opening and formed with faces g^2 g', and operating substantially as specified, and a wear-plate, H, fitted to the case next the folder and provided with an inclined face, h^2, and a lip, h^3, substantially as described, for the purposes set forth.

15. In a baling-press, the combination, with the press-case having a feed-opening, of a platform provided with an opening to admit the body of the feeder or attendant near the feed-opening of the press, substantially as described, for the purposes set forth.

16. The combination, with the press-frame, of a feeder-platform, N, attached at one edge to the frame next the baling-box and provided with an opening, as O, to admit the body of the attendant, and braces P, sustaining the platform from the press-frame, substantially as shown and described.

17. A baling-press constructed with side linings of its baling-box supported yieldingly or elastically at the rear end of said box, substantially as shown and described.

18. A baling-press constructed with side linings, R R, of its baling-box made to yield at the rear end of said box, combined with suitable timber supports or backing and bolts 6, nuts 7, and springs 9, substantially as described, for the purposes set forth.

19. A baling-press constructed with the rear portion of its baling-box formed with two opposite walls supported yieldingly or elastically and with its other two opposite walls fixed rigidly in positions to reduce the size of the baling-box from the feed-opening to the extreme rear end of the box, substantially as described, for the purposes set forth.

20. A baling-press constructed with a frame, side walls or linings, R R, held thereto and adapted to yield at their rear ends, backings to said linings, bolts 6, nuts 7, and springs 9, substantially as specified, and top and bottom linings, V U, having forward parts, v u, extending into the baling-box and fixed in positions to reduce the depth of the box from its feed-opening to its rear end by means of backing-timbers 15 16 and nutted bolts 17, substantially as shown and described.

21. A baling-press constructed with a bale-chamber, C, formed by corner timbers, A, and two opposite linings held thereto, and springs fitted to the chamber-walls to cause yielding pressure of the walls on the material being baled, substantially as herein set forth.

22. A baling-press constructed with a bale-chamber, C, formed by corner timbers, A, and two opposite linings held thereto, opposite timbers 19, fitted loosely in the timbers A, and springs fitted to the chamber-walls to cause yielding pressure of the walls on the material being baled, substantially as herein set forth.

23. A baling-press constructed with a bale-chamber, C, formed by corner timbers, A, and two opposite linings held thereto, in combination with cross bars or timbers arranged at the linings or walls of the press-frame, bolts, as W w, fitted to said cross bars, and a spring or springs, X, substantially as herein set forth.

24. A baling-press constructed with a bale-chamber, C, formed by corner timbers, A, and two opposite linings held thereto, opposite timbers 19, fitted loosely in the timbers A, cross bars or timbers arranged at the linings or walls of the press-frames, bolts, as W w, fitted to said cross bars, and a spring or springs, X, substantially as herein set forth.

25. A baling-press constructed with opposite pairs of cross-timbers 11 12 13 14, framed to the corner timbers of the press, and the inner faces of the cross-timbers dressed off, whereby when linings V U are secured to them the bale-chamber will be enlarged from front to rear, substantially as herein set forth.

26. A baling-press constructed with opposite pairs of frame-timbers 10, 11, 12, 13, and 14, those 11 being thickest and those 10 in front of them made thinner, and those 12 13 14 in rear of those 11 being successively thinner toward the rear end of the press, substantially as shown and described, whereby the parts u v of the linings U V, fixed to the timbers 10 and 11, and forming side walls to the baling-box, will diverge toward the plunger, and the rear parts of the linings fixed to the timbers 11, 12, 13, and 14 will diverge toward the rear end of the bale-chamber, substantially as herein set forth.

GEORGE ERTEL.

Witnesses:
RICHARD JANSEN, Sr.,
RICHARD JANSEN, Jr.