

No. 708,269.

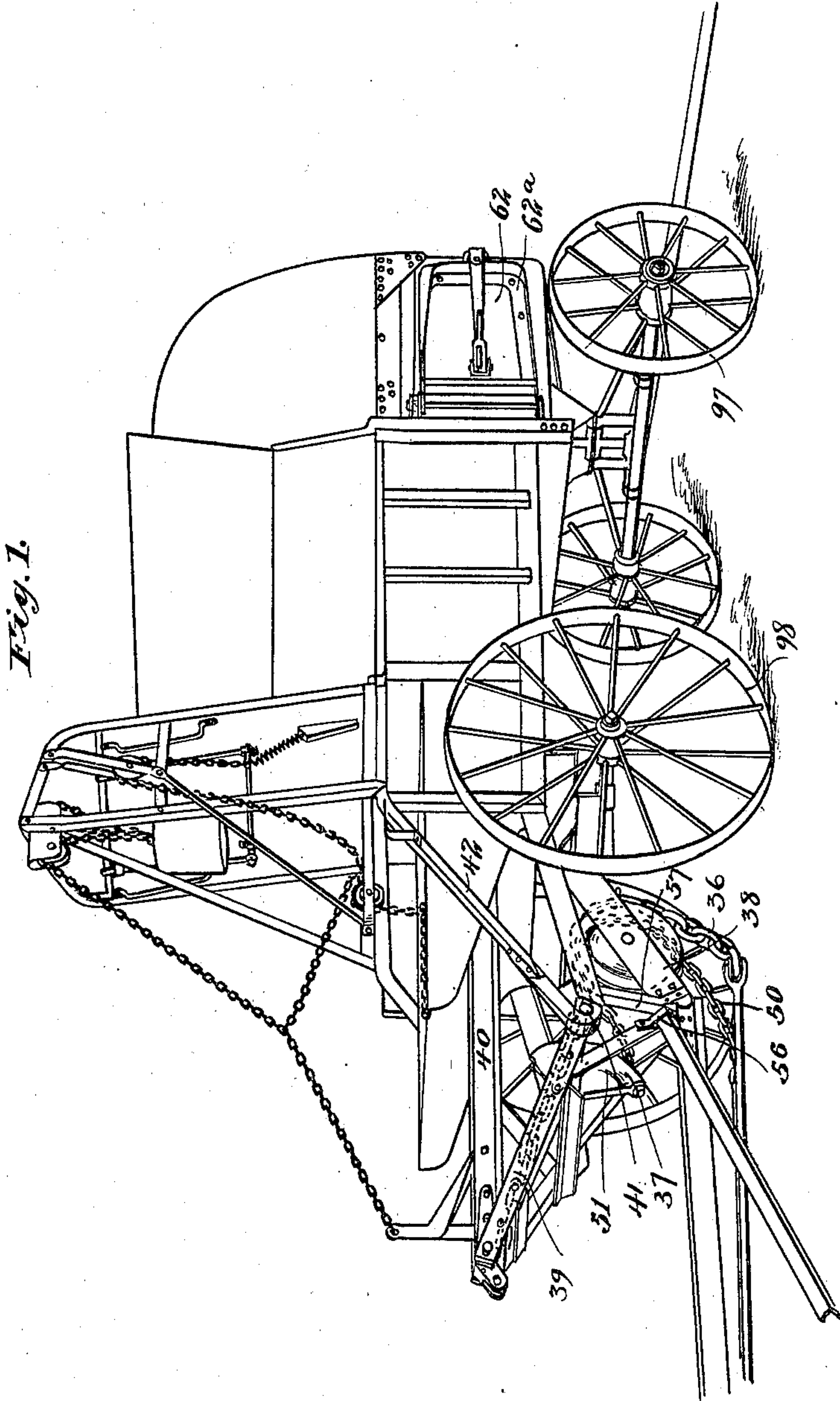
Patented Sept. 2, 1902.

J. A. SPENCER.
BALING PRESS.

(Application filed Oct. 28, 1901.)

(No Model.)

5 Sheets—Sheet 1.



Witnesses,
J. D. Mann,
S. W. Ford.

Inventor,
Julius A. Spencer,
By *Offield, Towle & Luthincum*
Attys.

No. 708,269.

Patented Sept. 2, 1902.

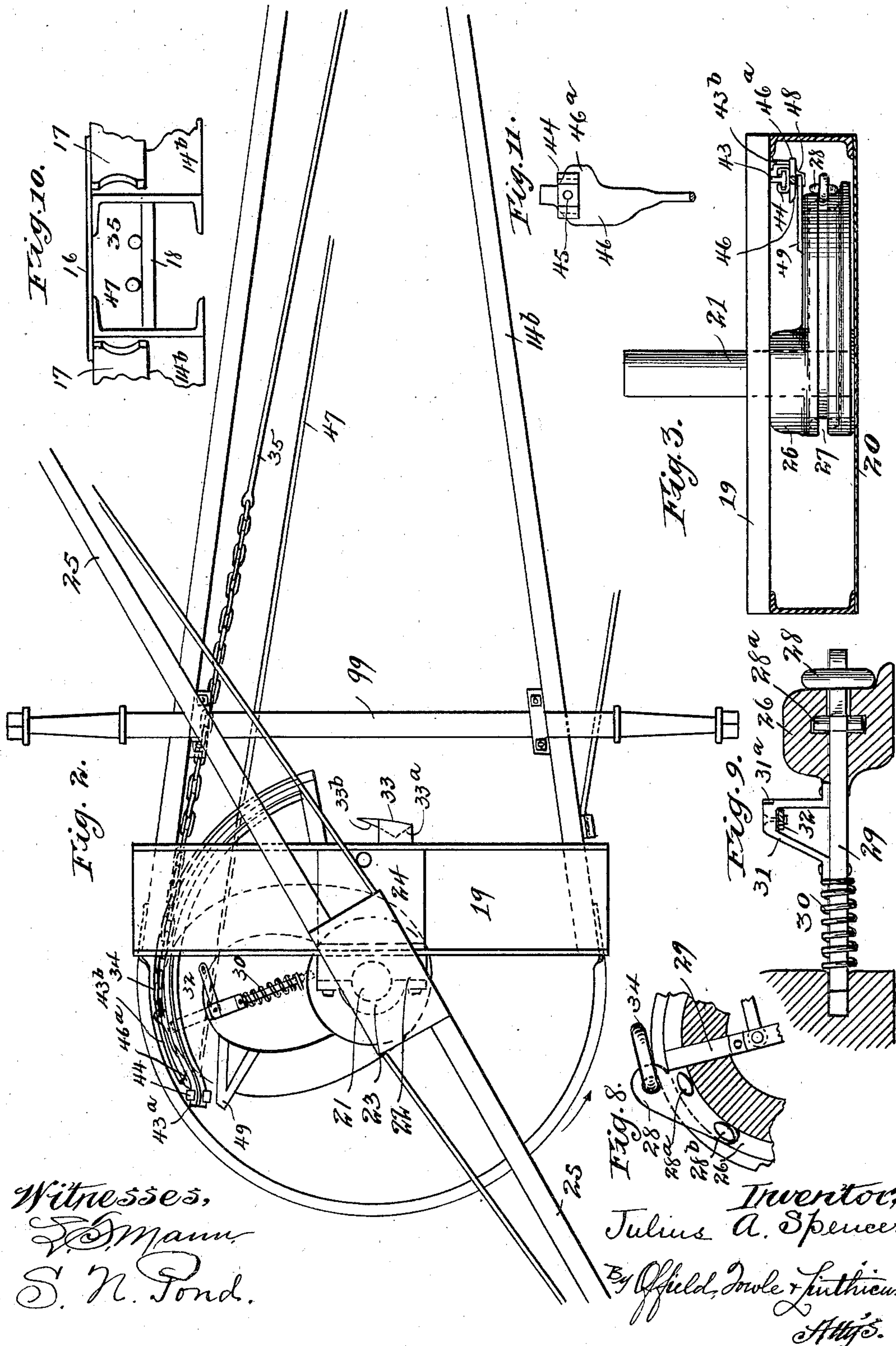
J. A. SPENCER.

BALING PRESS.

(Application filed Oct. 28, 1901.)

(No Model.)

5 Sheets—Sheet 2.



Witnesses,
S. Mann
S. N. Pond.

Inventor,
Julius A. Spencer.
By *Offield, Fowler & Luthicum*
Attys.

No. 708,269.

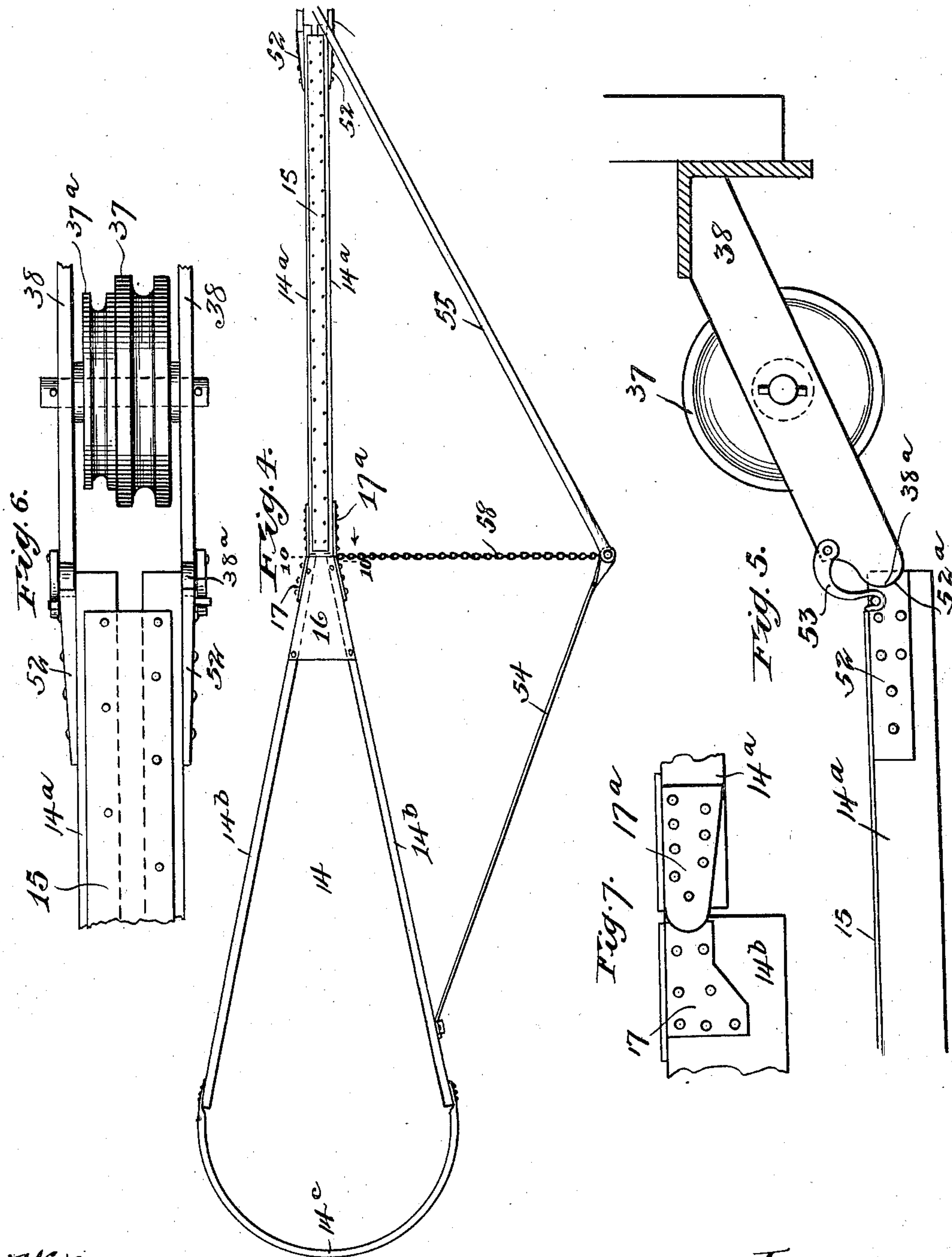
Patented Sept. 2, 1902.

J. A. SPENCER.
BALING PRESS.

(Application filed Oct. 28, 1901.)

(No Model.)

5 Sheets—Sheet 3.



Witnesses,
J. Mann.
J. N. Ford.

Inventor,
Julius A. Spencer,
By Offield, Towle & Lathicann
Atty's.

No. 708,269.

Patented Sept. 2, 1902.

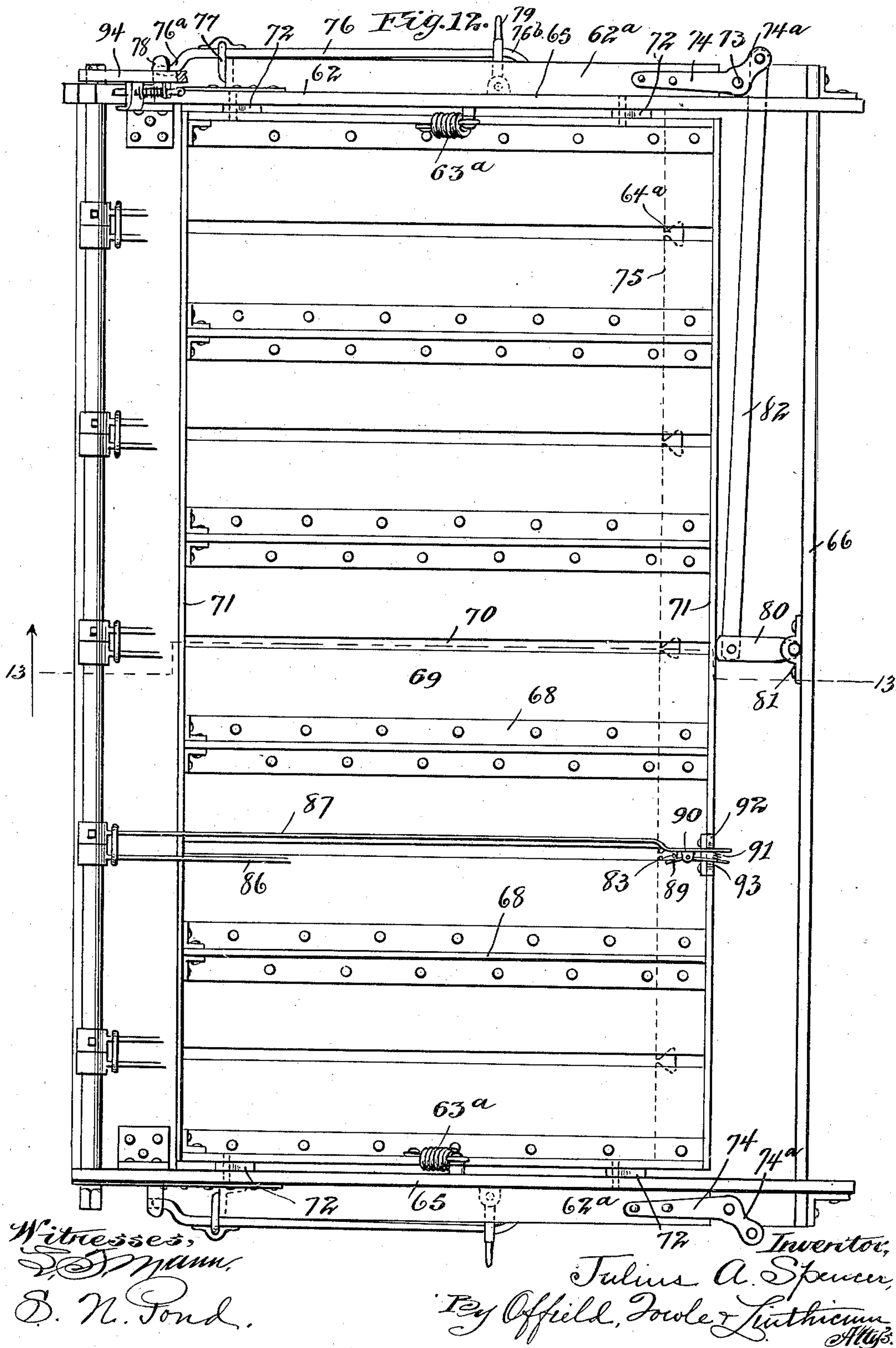
J. A. SPENCER.

BALING PRESS.

(Application filed Oct. 28, 1901.)

(No Model.)

5 Sheets—Sheet 4.



No. 708,269.

Patented Sept. 2, 1902.

J. A. SPENCER.
BALING PRESS.

(Application filed Oct. 28, 1901.)

(No Model.)

5 Sheets—Sheet 5.

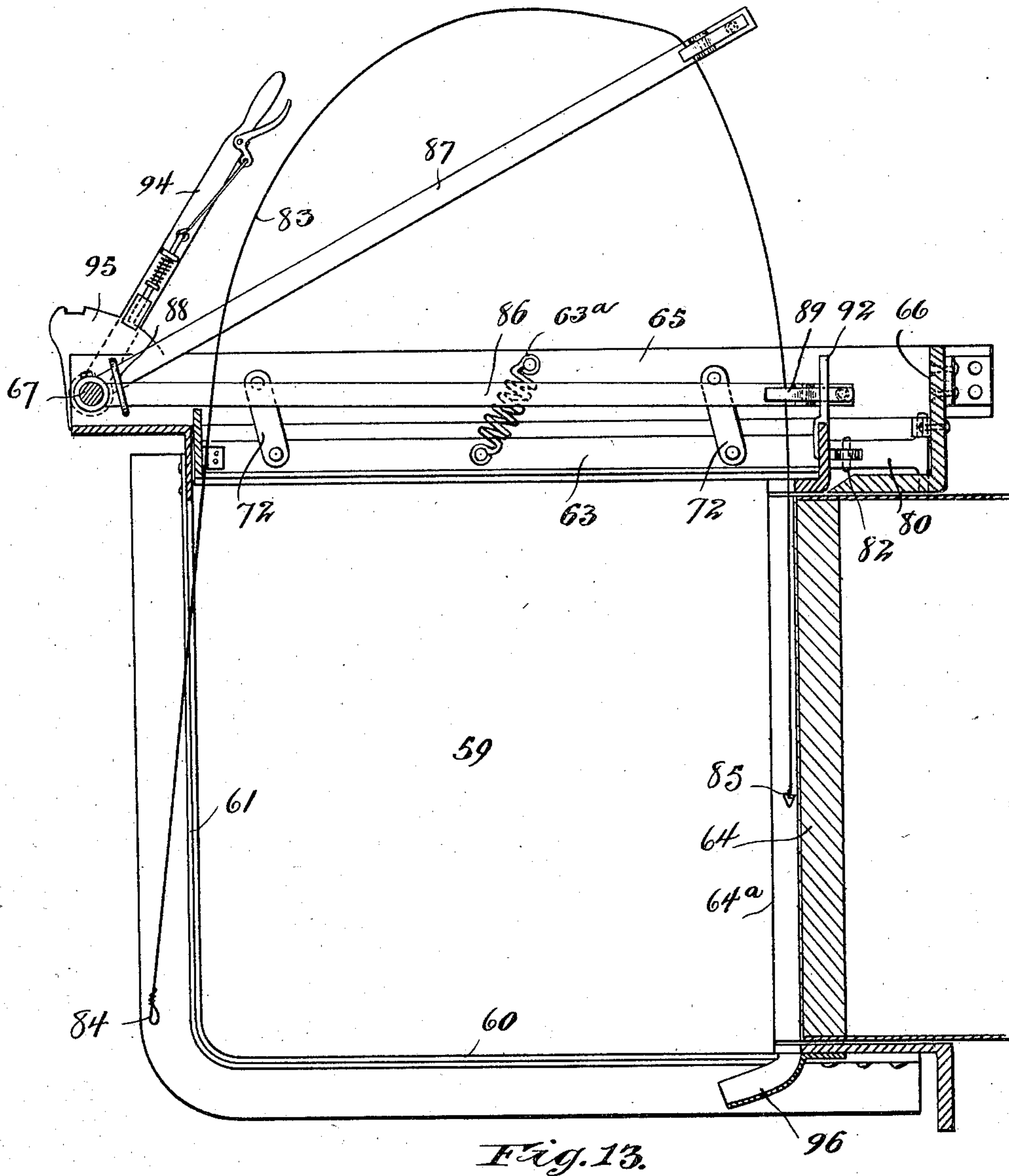


Fig. 13.

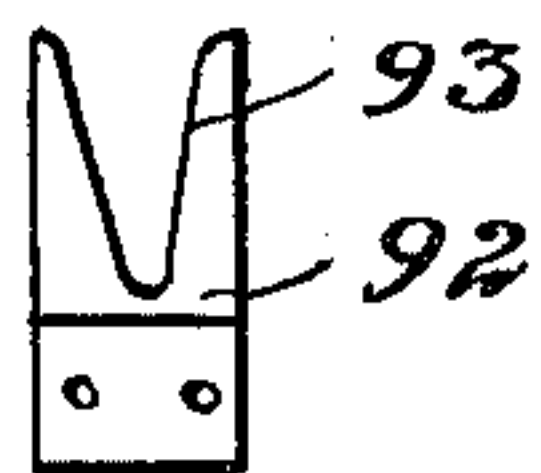


Fig. 14.

Witnesses,
J. J. Mann,
S. N. Pond.

Inventor,
Julius A. Spencer,
By Offield, Inole & Luthien
Atty's.

UNITED STATES PATENT OFFICE.

JULIUS A. SPENCER, OF DWIGHT, ILLINOIS.

BALING-PRESS.

SPECIFICATION forming part of Letters Patent No. 708,269, dated September 2, 1902.

Application filed October 28, 1901. Serial No. 80,272. (No model.)

To all whom it may concern:

Be it known that I, JULIUS A. SPENCER, a citizen of the United States, residing at Dwight, in the county of Livingston and State of Illinois, have invented certain new and useful Improvements in Baling-Presses, of which the following is a specification.

My invention relates to baling-presses such as are used for compressing and baling hay, straw, cotton, and the like to reduce the same to a form and size convenient for economical storage or shipment; and my improvements relate more specifically to that class or type of baling-presses known as "toggle-presses," although certain features of my improvements are capable of useful application to baling-presses of the numerous other known types.

Among the several objects of my invention may be mentioned, first, the provision of an improved mechanism for transmitting the power applied to operate the press to the plunger thereof, said mechanism being constructed and adapted to convert a continuous rotary movement in one direction exerted by the power into a uniform reciprocating movement of the bale-press follower or plunger; secondly, an improved construction of compression-chamber, the same having a vertically-movable top and outwardly-swinging doors covering the entire end areas of the chamber for facilitating the removal of the compressed and bound bale, and, thirdly, an improved mechanism for applying the binding-wires to the bale.

Other minor objects of the invention will appear later in the subjoined description thereof.

To these and other ends my invention consists in an improved bale-press having the novel features of construction and combinations of parts, as hereinafter fully described, and more particularly pointed out in the claims.

My invention, in a preferred embodiment of the same, is illustrated in the accompanying drawings, in which—

Figure 1 is a perspective elevational view of the baling-press chamber, the same being shown as portably mounted, and the immediate actuating agents of the follower and their mode of connection thereto being illus-

trated at the left-hand end of the view. Fig. 2 is a top plan view of the mechanism for transmitting and converting the power of the team exerted continuously in a rotary direction to effect the horizontal reciprocations of the follower. Fig. 3 is a transverse vertical sectional view through the casing of the cam-block and its immediately associated parts, certain parts being shown in elevation and others omitted for the sake of clearness. Fig. 4 is a top plan view of the frame or casing which contains the cam-block and its connections to the actuating mechanism of the follower and showing a means for insuring the lateral rigidity thereof. Fig. 5 is an enlarged detail view, in side elevation, illustrating the connection between the inner end of the frame or casing shown in Fig. 4 and the lower rear end of the portable support of the baling-chamber and also illustrating a guide-pulley over which are trained the chains connecting the plunger-actuating toggle with the continuously-rotating cam-block through which the power is supplied. Fig. 6 is a top plan view of the parts shown in Fig. 5. Fig. 7 is a detail in side elevation of the knuckle-joint at the meeting ends of the two sections of the casing shown in Fig. 4. Fig. 8 is a fragmentary detail view, partly in horizontal section, illustrating the grooved cam-block, one of the plunger-actuating travelers mounted therein, and the means for locking and releasing the traveler in the periphery of the cam-block. Fig. 9 is a fragmentary detail view, partly in vertical section and partly in elevation, of the mechanism shown in Fig. 8 and its immediately cooperating devices. Fig. 10 is a vertical sectional view on the line 10 10 of Fig. 4 looking in the direction of the arrow. Fig. 11 is a fragmentary detail, in plan view, of a portion of the plunger-returning mechanism shown in end elevation in Fig. 3. Fig. 12 is a top plan view of the compression-chamber, showing the movable top thereof, the outwardly-swinging end doors with the means for locking the same, and an automatic mechanism for locking the top against upward movement when the end doors are locked and for releasing the same when the end doors are released and opened. Fig. 13 is a vertical sectional view through the compression-chamber and the forward end of the

plunger and further illustrating my improved mechanism for applying the binding-wires, and Fig. 14 is an isolated elevational view of a socket-plate adapted to receive the free end of

one of the wire-actuating arms and automatically release the wire grip on the same when the arm has reached its lowermost portion.

In describing the several improvements in a baling-press to which my invention relates I will first describe the novel mechanism I have devised for converting the continuous rotary movement of the parts to which the power is directly applied into a uniform reciprocating movement of the follower or plunger through which the compression of the hay or other material subjected to its operation is effected. Referring, therefore, to Figs. 2 to 11, inclusive, of the accompanying drawings, wherein said mechanism is fully shown in its various details, the numeral 14 indicates as an entirety an elongated sectional framework or casing composed principally of structural-iron channel-beams suitably disposed and connected to constitute the vertical side and end walls of the casing. More specifically, this casing in its preferred form comprises a pair of parallel and closely-adjacent channel-beams 14^a, constituting the front end section of the casing, another pair of similar channel-beams 14^b abutting the rear end of the beams 14^a and constituting virtually a rearward extension thereof, the beams 14^b being disposed at an angle to each other, as shown in Figs. 2 and 4, and diverging toward their rear end, and a substantially semicircular channel-beam 14^c uniting the rear ends of the beams 14^b and constituting the closed end of the framework or casing. The parallel beams 14^a are preferably united by a top plate or cover 15, extending the entire length thereof, while the rear convergent ends of the beams 14^b may be similarly united by a top plate or cover 16. The meeting ends of the two sections of the casing 14 thus formed are not rigidly united, but simply abut each other, this abutment being in the form of a knuckle-joint, the beams 14^b having concave-ended cleats 17, which have endwise engagement with convex-ended cleats 17^a on the beams 14^a, Fig. 7. The front convergent extremities of the beams 14^b are preferably further united by a transverse rod or bolt 18, as shown in Fig. 10, for a purpose hereinafter disclosed. The rear divergent extremities of the side walls 14^b are united across the tops thereof by a transverse horizontally-disposed plate in the form of a channel-beam 19. An angle plate or bar 20 unites the bottom edges of the opposite ends of the curved end wall 14^c, this latter plate being centrally apertured to receive the lower end of a vertical shaft 21. A suitable bearing-block 22, to receive the shaft 21 intermediate its upper and lower ends, is securely bolted to the rear flange of the channel-beam 19, this bearing-block being suitably provided with journal-bearing rings or sleeves 23. A diagonal brace-

plate disposed across the plate 19 in front of the bearing-block 22 serves to stiffen the front wall of the plate 19 and increase the rigidity of the bearing. To the top of the shaft 21 are keyed a pair of oppositely-extending sweeps 25, to the outer ends of which the power, as represented by a team of horses, may be applied to give the shaft 21 a continuous rotary movement in the direction indicated by the arrow.

On the shaft 21 below the top plate 19 and within the semicircular rear end of the casing 14 is keyed a somewhat-oval or egg-shaped cam-block, (designated by 26.) This cam-block is provided with an undercut channel 27, extending entirely around the periphery thereof. A traveler 28 engages the periphery of the cam-block 26, the traveler being provided with a pair of shanks 28^a at its forward and rear ends, respectively, these shanks engaging the outer narrow portions of the channel 27 and being provided with lateral extensions 28^b, substantially oval in cross-section, as shown in Fig. 8, these extensions entering and traveling in the undercut portions of the channel 27, and thus locking the traveler in sliding engagement upon the periphery of the cam-block. The traveler 28 is connected through mechanism, to be hereinafter described, to the follower of the bale-press in such a manner that the advance movement of the traveler with the cam-block effects the forward or compressing movement of the follower. The means herein shown for locking the traveler 28 against sliding movement relatively to the periphery of the cam-block 26 and causing it to partake of the circular travel of that part of the periphery of the cam-block to which it is temporarily locked comprises an endwise-movable rod 29, disposed in the rim and web of the cam-block in a direction radially thereof, this rod being normally forced outwardly, so that its outer end projects into the channel 27 by means of a suitable coiled spring 30, surrounding its inner end and abutting against the bottom of the socket in which the rod is housed. Referring to Fig. 9, it will be observed that the locking-rod 29 is provided with a vertically-disposed bracket 31, the upper forward face of which is slightly rounded, as shown at 31^a, for a purpose hereinafter mentioned, and this bracket is pivoted through the top portion thereof to the free end of a short arm 32, which latter is pivoted at its opposite end to the body of the cam-block in such a manner that the arm 32 lies substantially at right angles to the rod 29 when the latter is at a point half-way between its locking and unlocking position. The pivotal connection between the bracket 31 and arm 32 is, of course, sufficiently loose to permit the slight longitudinal reciprocation of the rod 29. To the under side of the plate 19 is secured a fixed block 33, provided with a pair of cam-faces 33^a and 33^b, as shown in Fig. 2. This block is located in the path of

the upper end of the bracket 31 and is so disposed that as the cam-block 26 rotates the rounded forward face 31^a of the bracket 31 will engage the cam-face 33^a of the cam-block 33 in such a manner as to suddenly force the locking-rod 29 inwardly, thus releasing the traveler 28 and permitting it to slide freely in the groove or channel of the cam-block. From the foregoing it will be seen that with the parts in their respective positions as shown in Fig. 2 the rotation of the cam-block will cause the traveler to be carried on the periphery thereof until the engagement of the bracket 31 and the cam-block 33 just described occurs, whereupon the traveler will be released and will be free to return to the position shown. The cam-face 33^b is provided as a precaution against breakage of parts in case after the bracket has been carried by the cam-block the team should accidentally intermit the draft upon the sweeps or back up, thus allowing a return swing of the latter. The chief function of the arm 32 is to facilitate the quick and easy unlocking of the traveler 28, and this it does by diminishing the friction of the rod 29 in its housing, since it resists and offsets that component of the force imparted to rod 29 due to its contact with cam 33, which is transverse to the rod. Moreover it resists the tendency of the rod 29 to rock or roll on its longitudinal axis under the action of the cam.

The traveler 28 is connected by a chain 34 with the rear end of a suitable rod 35, this latter lying within and extending approximately the entire length of the casing 14 and having its front end attached to a chain 36. This latter is trained over a suitably grooved guide-pulley 37, journaled between a pair of downwardly-extending brackets 38, connected to the frame structure of the press proper, the other end of the chain 36 being connected to the pivotal joint of a toggle-lever mechanism which actuates the follower. This latter mechanism comprises a pair of obliquely-disposed arms 39, together constituting one link of the toggle, and a pitman 40, pivoted at its front end to the follower and at its forward end pivoted between the convergent extremities of the arms 39. The arms 39 are pivoted at their lower or divergent extremities on a shaft 41, which is held fixed in a pair of rearwardly-extending brackets 42, connected to the stationary frame of the press.

Having thus described the mechanism for effecting the advance or compressing movement of the plunger and the means for automatically throwing the same out of operation at the conclusion of such movement, I will next describe the mechanism whereby I effect the return movement of the plunger and of its forward actuating mechanism through the continued rotation of the cam-block 26.

To the under side of the bridge or plate 19 is rigidly secured a substantially semicircular track 43 of inverted-T shape in cross-section, as clearly shown in Fig. 3. A traveler 44 en-

gages this track in such a manner as to ride back and forth freely therealong. The traveler 44 is swiveled by means of a bolt 45, Fig. 11, to a plate 46, which latter constitutes a link between the traveler and a suitable rod 47, extending through the casing 14 alongside of the companion rod 35, already described. The plate 46 may be welded or otherwise rigidly connected to the rod 47, or it may constitute simply a broadened and flattened extension of the rear end of said rod. On the under face of the plate 46 is an integral depending lug 48, as shown in Fig. 3, which latter lies in the path of and is adapted to be engaged by the outer end of an arm or bracket 49, secured rigidly on the upper face of the cam-block 26. Now it will be observed by reference to Fig. 2 that the forward end of the track 43 is curved abruptly outwardly at 43^a from the line of a true circle of which the major portion of the track constitutes an arc. From this it will be evident that as the cam-block 26 in its rotation reaches a point such as to bring the arm 49 into contact with the lug 48 at the inner end of the track 43 the traveler 44 will be advanced along the track, thereby drawing with it the rod 47 until it reaches the outwardly-curved forward end 43^a of the track 43, whereupon the traveler will automatically move out of the reach of and engagement with the arm 49 and will then be free to return along its track to the inner end of the latter. The inner or front end of connecting-rod 47 has attached thereto a chain 50, as shown in Fig. 1, this latter passing upwardly over a second guide-pulley 37^a, mounted alongside pulley 37 and having its other end connected to a segment-block 51. This latter is suitably secured to and between the arms 39, constituting the lowermost link of the toggle, in such a manner that its arc-shaped operative face lies below the shaft 41, about which the lower end of the toggle-arm 39 swings. A pull upon the chain 50 therefore tends to actuate the toggle in a direction opposite to the movement of the toggle under the action of the chain 36—that is to say, a rearward pull upon the chain 36 so actuates the toggle as to effect the forward or closing movement of the follower, while a similar pull upon the chain 50 serves to retract the follower by an opposite actuation of the toggle through the segment-block 51.

It will be seen that the pull or drag of the connecting-link 47 upon the traveler 44 is largely in a direction sidewise or laterally of said traveler during its advancing movement. This being the case, it is desirable to provide means for maintaining the position of the traveler directly beneath its track 43 and preventing it from being pulled or tilted off to one side thereof, which would result in excessive friction and wear of the parts. The means herein shown for this purpose comprise a guide-rail 43^b, located parallel with and closely adjacent the outer side of the

track 43 and terminating just short of the outwardly-turned end of the latter, as plainly shown in Figs. 2 and 3. The lower margin of this track 43^b is designed to be slidingly engaged by a lateral protuberance 46^a on the corresponding side or margin of the plate 46, to which the traveler 44 is swiveled. This mechanism provides an effective resistance to such lateral distortion of the traveler relatively to its track and provides for the necessary engagement of said parts with a minimum of friction and wear.

I have already described how the movement of the cam-block 26 through a major part of its rotation advances the traveler 28 and through the connections described effects the forward or compressing movement of the follower, the traveler 28 being automatically released at the conclusion of this movement of the traveler. I have also described how during the remaining part rotation of the cam-block the traveler 44 is engaged by the latter and through the connections described is caused to effect the return movement of the follower. It will be observed in connection with the alternating operation of these devices that as soon as one traveler is released by the cam-block the other is shortly after picked up and engaged by the latter. It will also be observed that by reason of the fact that the two travelers are connected on opposite sides of a common pivotal point at the rear of the baling-press while one traveler is undergoing its forward and operative movement the other is simultaneously undergoing its return or idle movement, whereby at the completion of each entire rotation of the cam-block the engaging devices on the latter find and pick up the travelers at the same points.

My invention aims to provide a readily-separable joint between the forward end of the framework or casing 14 and the rear end of the carriage containing the baling-press proper, and in accordance with my invention I locate this joint directly in the line of draft of the chains 36 and 50. As shown in Figs. 5 and 6, the forward ends of the channel-beams 14^a are provided with a pair of cleats 52, bolted to the outer sides thereof, the forward ends of which cleats are concaved, as shown at 52^a, to fit correspondingly-convexed outer ends 38^a of the rearwardly-depending bracket-arms 38, between which the guide-sheaves 37 and 37^a are journaled. This concaved end of the casing 14 is held up into engagement with the bracket-arms 38 by a pair of hooks 53, and the pulleys 37 and 37^a are so mounted that the chains 36 and 50 will be tangent to said pulleys along a line which passes directly through the knuckle-joint above described. By reason of the fact that the draft or strain is thus directly in line with the abutting bracket-arms and casing the joint described is entirely efficient to resist such longitudinal strains, and no lateral strengthening of the joint is necessary, for the obvious reason that there are no lateral

strains upon the parts at their point of abutment. These knuckle-joints between the two sections of the casing 14 and between the latter and the baling-press body are designed primarily to permit the casing 14, which houses the rod and chain connections and which is of considerable length, to conform to elevations, depressions, and other unevennesses of the ground between the cam-block and the body or carriage and still preserve a solid abutment between the sections of the casing and the latter and the body or carriage to properly resist the severe endwise strains to which said parts are subjected. In this connection it may be observed that the transverse rod 18, Fig. 10, serves to support the two connecting-rods 35 and 47 and hold them up between the planes of the top and bottom of the casing, thus preventing the "buckling" that might occur were said rods permitted to drop below the casing. The top plate 16 of course prevents the rods from rising above the casing. This construction, moreover, provides extremely simple and readily-separable connections, it being necessary only to release the hooks 53 when the parts are to be separated for transportation to another field of operation. I regard this as an important feature of my invention.

It will be evident that the application of the power to the sweeps 25 in the direction indicated by the arrow will through the vertical shaft upon which said sweeps are mounted and its bearings in the casing 14 produce a tendency to rotate or swing the contracted end of the V-shaped portion of the casing outwardly in the direction of movement of the sweeps away from its abutment against the contracted portion of the casing represented by the parts 14^a and 15. In order to offset this tendency of the two sections of the casing to separate at this point, I prefer to employ a pair of compression-struts 54 55, the former being removably engaged with one of the side members 14^b of the casing and the other, which is preferably made of angle-iron, seating in a collar 56 and abutting a stationary bracket 57, connected with the rear end of the press-carriage. A chain 58 connects the pivotal joint of the struts 54 55 with the contracted end of the V-shaped element of the casing, the mechanism described serving in an obvious manner to effectively resist any tendency of said contracted end to move out of line with the narrow section of the casing which it abuts.

I will next describe the improvements which I have devised relating to the chamber in which the hay or other material is subjected to the condensing action of the follower and subsequently receives the baling cords or wires. This mechanism is shown in Figs. 1, 12, 13, and 14, wherein I employ the numeral 59 to designate the compression-chamber as an entirety. The chamber 59 is rectangular in form, its bottom wall or floor being designated by 60 and its front wall by 61, these

last-named walls being made stationary. The chamber is provided in each end with an outwardly-swinging door 62 and has a vertically-movable top wall or cover 63. The remaining or rear wall of the chamber is constituted by the face of the follower or plunger, which I have designated by 64. Surmounting and surrounding the compression-chamber thus outlined is a fixed horizontal rectangular frame which comprises side plates 65, a rear plate 66, and a front rod or shaft 67, journaled between the front ends of the side plates 65. The top or cover 63 is made up of a series of inverted T-beams 68, disposed in parallel relation and having bolted to their horizontal bottom flanges a series of plates 69, the proximate edges of which do not quite contact, but are separated by narrow slots 70, all as plainly shown in Fig. 12. The T-beams and plates last described are contained between a pair of parallel front and rear frame-plates 71, these parts thus united constituting the cover of the compression-chamber. This top or cover, which, as an entirety, I have designated by 63, is suspended at its opposite ends by links 72 from the side members 65 of the outer and upper frame, the suspension being such that when the cover is in its lowermost and closed position, as shown in Fig. 13, the links 72 will be disposed slightly oblique or out of a vertical line. From this construction it will be evident that an upward pressure exerted on the lower face of the cover 63 will have a tendency to swing said cover in a combined upward and rearward direction, as shown in Fig. 13. This tendency is resisted during the compressing operation by an automatic locking device connected with the end doors of the chamber, as hereinafter described. The end doors 62 are hinged on vertical pivots 73 by suitable hinges 74, secured to a rib 62^a on the outer face of the door, the pivots about which the doors swing being located considerably back of the line marking the inner extreme of the follower's movement, this latter position being indicated in Fig. 12 by the dotted line marked 75. From the foregoing it will be seen that when the doors 62 are swung outwardly through a right angle or more the ends of the compression-chamber are opened to an extent somewhat in excess of the end area of the compressed bale, thus permitting the usual slight expansion thereof, which occurs upon the return of the follower, to take place and still leave ample room for the withdrawal of the bale through either end of the chamber. The compression of the bale is accompanied by a considerable endwise expansive pressure, as well as an enormous transverse pressure, of the bale upon the walls of its containing-chamber. This necessitates the provision of strong and secure means for locking the end doors 62 in closed position during the compressing operation. The mechanism I prefer to employ for this purpose comprises a hasp 76, which is pivoted on a

fixed hinge-bolt 77, secured to the laterally-projecting rib 62^a on the outer face of the door-plate. The short inwardly-bent end 76^a of the hasp is adapted to engage a staple 78 when the door is closed, the longer arm of the hasp overlying the rib of the door and extending substantially parallel with the surface of the door and having its inwardly-curved end 76^b overridden by a swinging staple 79, pivoted in suitable lugs on the face of the door-plate. It will be seen that the above-described locking device affords a powerful leverage in closing the door tightly and a secure lock against the opening thereof by pressure from within the chamber. The means which I have devised for locking the top or cover of the chamber in closed position while the end doors are closed and releasing the same when one of the doors is released comprises a short horizontal arm 80, pivoted in a suitable bracket 81 to the rear wall 66 of the top frame and having its free end connected by a link-bar 82 with a rearward extension 74^a of the hinge 74. The outer end of the arm 80 is rounded, as shown, thereby facilitating its engagement and disengagement with the rear vertical wall 71 of the cover as the arm 80 is swung on its pivot. From the foregoing construction it will be seen that the opening of the door 62 will swing the outer end of the arm 80 out of contact with the wall 71 of the cover and will permit the latter to make the rearward movement required by its manner of support through the oblique links 72. The closing of the door 62 restores the arm 80 to the position shown in Fig. 11, in which it securely locks the cover against rearward, and consequently against upward, movement. It will be observed that the link-bar 82 is interchangeable to connect with either of the hinges 74, thus permitting the compression-chamber to be opened at whichever end is most conveniently located for the withdrawal of the bale. The top or cover 63 of the baling-chamber possesses considerable weight, which of course rests upon the top of the bale at all times, and unless its weight be counteracted interferes somewhat with the ready withdrawal of the compressed and tied bale. In carrying out my invention, therefore, I provide means for substantially counteracting the weight of the cover, these means in the instance shown comprising a pair of springs 63^a, secured at their lower ends to the opposite end members of the cover and at their upper ends connected to any convenient stationary member of the machine-frame, said springs, as herein shown, being anchored to the side plates 65 of the rectangular frame which surmounts the compression-chamber. When thus connected, the springs are preferably disposed on an incline, as shown, opposite to the incline of the links 72, and the springs will preferably be of a strength just sufficient to overcome the gravity of the cover and lift the latter out of contact with the top

of the bale when the latter is to be withdrawn. The oblique or inclined disposition of the springs is preferred, for the reason that the cover in rising has a combined rearward-and-upward movement, as already described, both of which movements are facilitated by disposing the springs obliquely in the direction of the resultant movement of the cover. It will be obvious that other and mechanically equivalent means, as a suitably-connected weight, might be employed in lieu of the means shown.

I will next describe my improved means for tucking the baling-wires. In order to permit the application of these wires to the bale from the outside while the latter is still in a state of compression, it is of course necessary to provide narrow slots or openings at suitable intervals around the walls of the compression-chamber, through which the wire may pass into engagement with the surface of the bale. The slots 70 in the cover 63, already described, are for this purpose. The front wall 61 and the bottom wall 60 of the chamber are both provided with similar slots disposed in the same vertical planes transversely of the chamber as the slots 70. Finally, the forward face of the follower 64 is provided with a series of vertical grooves 64^a, also registering with the slots of the top, bottom, and front walls of the chamber. These grooves 64^a are triangular in cross-section, as shown in Fig. 12, the mouth of the groove being contracted to a width just sufficient to allow the wire to pass therethrough. This is for the purpose of preventing entrance of the material operated upon into the grooves during the compressing operation. One of the bale-wires is shown in Fig. 13 at 83, the same being provided at its forward end with a loop 84 and at its rear end with a small barb 85 and being threaded up through the slots of the front wall and cover of the chamber, thence bent downwardly and threaded again through the rear portion of the cover and through one of the vertical grooves 64^a in the face of the plunger. In order to secure passage of the forward end of the wire down through the groove of the plunger and the bottom wall of the chamber, it is necessary to provide an actuating means for positively forcing the wire through this portion of its travel. For this purpose I have provided upon the rock-shaft 67 a series of wire-actuating arms, there being a plurality of these arms designed for engagement with each wire. One of these arms 86 is loosely mounted on the shaft 67, while its companion arm 87 is rigidly keyed on the shaft. The two arms are united near their pivotal point on the shaft 67 by a loop 88 of such length and so disposed as to permit the independent movement of said arms through a limited angle and insure their simultaneous movement when sought to be separated through a greater angle. Each one of these arms carries at its outer end an automatic wire-grip, the same con-

sisting, as shown in Fig. 12, of a clamp 89, pivoted between a pair of lugs 90 on the face of the arm, the rearward extension of the clamp being normally pressed outward by a spring 91, this latter movement serving in an obvious manner to cause the forward end of the clamp to engage and hold the wire 83. On the rear wall of the cover 63 are secured a series of catches 92, (see Figs. 12 and 13,) each catch having a V-shaped notch 93 in its upper end adapted to receive the outer ends of the arms 86 and 87 in such a manner as to rock the clamps 89 in a direction to compress the springs 91 and release the wire 83. The shaft 67 may be provided with an ordinary actuating-arm 94 and segment-rack 95, by means of which the simultaneous movements of the several series of wire-tucking arms may be secured. From an inspection of Fig. 13 it will be evident that when the arm 94 is thrown into engagement with the highest notch of the segment-rack the rocking of shaft 67 will elevate the arms 86 and 87 through corresponding angles, the arm 86 then occupying approximately the position shown as occupied by arm 87 and the latter standing approximately vertical. The wire to be tucked will then be threaded into engagement with the clamps 89, with the barb just entering the top of the groove 64^a of the plunger. On then swinging the actuating-arm 94 downwardly the loose arm 86 will drop to the horizontal position shown, thus forcing the wire down through the groove of the plunger to the extent illustrated in Fig. 13. The reception of the clamp 89 by the groove 93 of the catch 92 frees the wire relatively to the arm 86, and the subsequent downward swing of the arm 87 carries the wire entirely through the groove of the plunger, the lower end of the wire emerging through a downwardly-inclined guide-spout 96, secured to the under wall of the chamber in alignment with the groove of the plunger. The wire may then be drawn the remaining distance about the bale by hand, the barb 85 being secured in the opposite looped end 84 of the wire. Several successive reciprocations of the follower or plunger 64 are ordinarily required to effect the complete compression of each bale to the weight or density desired. When this has been done and the several retaining-wires secured about the bale in the manner described, the unlocking and opening of that door with the hinge of which the locking-arm 80 is connected will automatically release the cover 63 and allow the bale to expand to the extent permitted by the fastening-wires 83. The final withdrawal of the follower is also accompanied by a slight horizontal expansion of the bale; but after this has taken place the bale will still have a width sufficiently less than the width of the opening at the end of the chamber to permit the bale to be readily withdrawn.

The press body or carriage is preferably made portable by being mounted upon fore

and rear wheels 97 and 98, respectively. The rear section of the casing 14 and its contained mechanism may also be rendered easily portable by means of an axle 99, disposed transversely thereof at approximately the center of equilibrium, this axle being designed to receive wheels (not shown) when the device is not in use or is to be transported to another place of operation.

10 The operation of the follower-actuating mechanism and of the bale-fastening devices as well as the action and capability of the compression-chamber have been fully indicated in connection with the preceding description of their construction, and need not, therefore, be repeated.

It will be noted that the sectional character of the casing 14 and the peculiar knuckle-joint connections of the latter and between the latter and the press-carriage enable the device as a whole to operate satisfactorily upon uneven ground, at the same time maintaining the line of draft within the lateral and vertical limits of the casing, thereby avoiding all danger of buckling the casing at the joints and rendering it readily separable. It should also be remarked that the cam-block is so disposed relatively to the follower that the latter is given a more rapid travel during the first half of its compressing stroke, and during the latter portion of such compression-stroke the cam-block is in such a position relatively to its connections to the follower as to give the team a gradually-increasing mechanical advantage as the plunger nears the completion of its compression-stroke.

It will be obvious that numerous modifications might be made in the specific details of construction as hereinabove described, and shown in the drawings, without departing from the spirit of the invention. I do not, therefore, limit myself to the precise details shown and described except in so far as they may be made the subject of specific claims.

I claim—

1. In a baling-press or the like, the combination with a cam-block adapted to be continuously rotated and a traveler connected to the follower of the press and slidable on the periphery of the cam-block, of a longitudinally-movable locking-bolt for the traveler carried by the cam-block and provided with a lateral extension, a fixed cam adapted to engage the lateral extension of said bolt and actuate the latter through its unlocking movement, and an arm pivoted to said lateral extension and to the body of the cam-block and serving to counteract that component of the cam's action which is transverse to the bolt, substantially as described.

2. In a baling-press or the like, the combination with a rotatable cam-block and a traveler connected to the follower of the press and slidable on the periphery of the cam-block, of a longitudinally-movable locking-bolt for the traveler housed in the cam-block and pro-

vided with a vertical extension, a fixed cam having two cam-faces adapted to engage the vertical extension of said bolt on opposite rotative movements of the cam-block, respectively, and actuate said bolt through its unlocking movement, and an arm pivoted to said vertical extension and to the body of the cam-block and serving to counteract that component of the cam's action which is transverse to the bolt, substantially as described.

3. In a baling-press or the like, the combination with a cam-block adapted to be continuously rotated and a fixed track disposed adjacent said cam-block and on the arc of a circle whose center is coincident with the pivotal axis of the cam-block, said track having one end thereof abruptly curved outwardly, of a traveler connected to the follower of the press and slidably engaging said track, and a fixed projection on the cam-block adapted to advance the traveler along the track, the latter, when it reaches the outwardly-curved end of the track passing out of contact with the projection, substantially as described.

4. In a baling-press or the like, the combination with a continuously-rotatable cam-block and a fixed track disposed above said cam-block and on the arc of a circle whose center is coincident with the pivotal axis of the cam-block, said track having one end thereof abruptly curved outwardly, of a depending traveler slidably engaging said track, a power-transmitting connecting-rod swiveled to the under side of said traveler, said rod having a depending lug, and a fixed arm projecting radially from the periphery of the cam-block and adapted to contact said lug and thus advance the traveler along the track until the traveler enters upon the outwardly-curved end of the track, thus separating the actuating arm and lug, substantially as described.

5. In a baling-press or the like, the combination with a continuously-rotatable cam-block and a fixed curved track disposed above said cam-block, of a depending traveler slidably engaging said track, a power-transmitting connecting-rod swiveled to the under side of said traveler, said rod having a depending lug, a fixed arm projecting radially from the periphery of the cam-block and adapted to contact said lug to advance the traveler along the track, and means slidably engaged by said connecting-rod adjacent its connection to the traveler and serving to prevent lateral distortion of the latter relatively to its track, substantially as described.

6. In a baling-press or the like, the combination with a continuously-rotatable cam-block and a fixed curved track disposed above said cam-block, of a depending traveler slidably engaging said track, a power-transmitting connecting-rod swiveled to the under side of said traveler, said rod having a depending lug and a lateral protuberance

at its swiveled end, a fixed arm projecting radially from the periphery of the cam-block and adapted to contact said lug to advance the traveler along the track, and a fixed curved guide-rail disposed parallel with the outer side of said track and closely adjacent thereto, said guide-rail being slidably engaged on its lower face by the lateral protuberance of the connecting-rod to prevent lateral distortion of the traveler relatively to its track, substantially as described.

7. In a baling-press or the like, an elongated framework or casing adapted to connect the power-receiving devices with the rear end of the press-body and to contain the power-transmitting connections to the follower, said casing being formed in two longitudinal sections the proximate ends of which abut each other in a knuckle-joint, as and for the purpose described.

8. In a baling-press or the like, an elongated framework or casing adapted to connect the power-receiving devices with the rear end of the press-body, said casing being made in two endwise-abutting sections having a knuckle-joint at their point of abutment, and a transverse rod disposed across said casing adjacent the knuckle-joint and serving to sustain the power-transmitting connections above the bottom of the casing at said joint, substantially as and for the purpose described.

9. In a baling-press or the like, an elongated casing for the power-transmitting connections, said casing being formed in two unconnected longitudinal sections which abut each other in a knuckle-joint, the rear section being adapted to contain at its rear end the power-receiving devices and having at its forward end a transverse support for the power-transmitting connections, and the forward section adapted to form a knuckle-joint with a fixed abutting member on the press-body in the line of draft of the power-transmitting connections, substantially as and for the purpose described.

10. In a baling-press or the like, an elongated casing formed in two unconnected endwise-abutting sections, power-receiving devices mounted in the rear end of the rear section, a press-body having a fixed rearwardly-extending bracket adapted to abut the forward end of the front section of the casing, a pair of guide-pulleys mounted in said bracket, and power-transmitting connections connected with the power-receiving devices and passing through said sectional casing and thence around said guide-pulleys, the abutting ends of the sections of the casing and the bracket being provided with knuckle-joints within which the line of draft falls, substantially as and for the purpose described.

11. In a baling-press or the like, an elongated casing formed in two unconnected endwise-abutting sections, power-receiving devices having curved paths of movement mounted in the rear end of the rear section, a press-body having a fixed rearwardly-extending

bracket adapted to abut the forward end of the front section of the casing, a pair of guide-pulleys mounted in said bracket, and power-transmitting connections between the power-receiving devices and the pulleys, the same comprising a pair of rods longitudinally disposed within the casing and chains connected with the ends of said rods, and operating over the curved paths of said power-receiving devices and the peripheries of said pulleys, substantially as and for the purpose described.

12. A baling-press chamber having a vertically-extensible top wall and a door at one end thereof, combined with a locking device normally serving to lock the top of the chamber against extension, and connections therefrom to the door whereby, when the door is opened, the locking device is released and the top is free to rise under the expansion of the bale, substantially as described.

13. A baling-press chamber having a stationary bottom and front wall and a vertically-extensible top wall and a door covering one end of the chamber, in combination with a locking-arm for the top wall and connections therefrom to the hinge of the door, said arm engaging the top wall in a manner to prevent movement thereof when the door is closed and to permit the rise thereof when the door is opened, substantially as described.

14. In a baling-press, the combination with a bale-chamber and a fixed horizontal frame surrounding and surmounting the same, of a top or cover for the chamber, a series of obliquely-disposed links whereby said cover is suspended from said frame, a door closing one entire end of the chamber, a locking-arm pivoted to said frame and in its locking position abutting said cover, and a link connecting said locking-arm with the hinge of the door, whereby the opening of the door withdraws said locking-arm and permits the cover to swing rearwardly and upwardly on its supporting-links, all substantially as described.

15. In a baling-press, the combination with a bale-chamber having stationary front and bottom walls and a pair of doors constituting the end walls of the chamber, respectively, of a top or cover for the chamber mounted so as to be capable of a vertical extension, a locking device for said top or cover, and an interchangeable connection between said locking device and either of said doors adapted to maintain the cover in its lowermost position when the doors are closed and permit it to rise when the doors are opened, substantially as described.

16. In a baling-press chamber, the combination with a bale-chamber and a fixed horizontal frame surrounding and surmounting the same, of a top or cover for the chamber, a series of obliquely-disposed links whereby said cover is suspended at its ends from said frame, doors closing the entire ends of the chamber, respectively, a horizontal locking-arm pivoted to said frame and at its free end abutting the vertical rear wall of said cover,

and an interchangeable link adapted to connect said locking-arm with the hinge of either of said doors, whereby when that door to which the arm is connected is opened, the locking-arm is withdrawn and the cover is free to swing rearwardly and upwardly, substantially as described.

17. In a baling-press, the combination with a bale-chamber and a door hinged and covering one end of the same, of a locking-hasps pivoted to said door near the outer or free edge thereof, a fixed staple adapted to receive the outer end of the hasp when the door is closed, and means for locking the inner end of the hasp against outward movement relatively to the door, substantially as described.

18. In a baling-press, the combination with a bale-chamber and a hinged door covering the entire end thereof, of a locking-hasps having an inwardly-bent outer end pivoted just back of such inwardly-bent end to said door near the outer or free edge thereof, a fixed staple adapted to receive the inwardly-bent end of the hasp when the door is closed, and means on the door adapted to engage the longer rearwardly-extending arm of the hasp and thereby lock the door in closed position, substantially as described.

19. In a baling-press, the combination with a bale-chamber and a hinged door covering the entire end thereof, of a locking-hasps having inwardly-bent outer and inner ends and pivoted just back of its outer end to the door near the free or outer edge thereof, a fixed staple adapted to receive the inwardly-bent outer end of the hasp when the door is closed, and a pivoted staple mounted in the outer face of the door and adapted to override the inwardly-bent inner end of the hasp and thereby lock the door in closed position, substantially as described.

20. In a baling-press, the combination with a bale-chamber provided with suitable transverse slots in the containing-walls thereof, of a wire-tucking device, the same comprising an arm pivoted above said chamber and means for actuating the same, and a wire-clamp mounted on the free end of said arm and adapted to clamp the wire and force the same through the slotted walls of the chamber upon the actuation of said arm, substantially as described.

21. In a baling-press, the combination with a bale-chamber provided with suitable transverse slots in the containing-walls thereof, of a wire-tucking device, the same comprising an arm pivoted above said chamber and means for actuating the same, a wire-clamp mounted on the free end of said arm and adapted to clamp the wire and force the same through the slotted walls of the chamber during its downward movement, and a clamp-releasing device adapted to receive the clamp and automatically release the wire therefrom when the arm reaches the limit of its operative movement, substantially as described.

22. In a baling-press, the combination with a bale-chamber having transverse slots formed through the walls thereof to permit the admission of the baling-wires, of means for tucking the wires therethrough, the same comprising a horizontal rock-shaft mounted above and along one side of the chamber, a pair of arms one fixedly and the other loosely mounted adjacent each other and at corresponding ends upon said rock-shaft, means limiting the angle of divergence of said arms, and clamps on the outer free ends of said arms adapted to grip the baling-wires and successively force the same through the slotted walls of the chamber upon the actuation of the rock-shaft, substantially as described.

23. In a baling-press, the combination with a bale-chamber having transverse slots formed through the walls thereof to permit the admission of the baling-wires, of means for tucking the wires therethrough, the same comprising a horizontal rock-shaft mounted above and along one side of the chamber, a pair of arms one fixedly and the other loosely mounted adjacent each other and at corresponding ends upon said rock-shaft, a link embracing said arms near their pivotal point and limiting their angle of divergence, clamps on the outer free ends of said arms adapted to clamp the baling-wires and successively force the same through the slotted walls of the chamber, and a stationary clamp-releasing device adapted to engage said clamps in the lowermost position of the arms, substantially as described.

24. In a baling-press, the combination with a bale-chamber having its top, bottom and front walls transversely slotted for the passage therethrough of the baling-wires, of a follower constituting the rear wall of the chamber, the face of the follower being provided with vertical grooves disposed in the same vertical planes as the slots of the chamber, and mechanism mounted above the chamber adapted to grip the baling-wires and tuck them through the slotted walls of the chamber and the grooves of the follower, substantially as described.

25. In a baling-press, the combination with a bale-chamber having its top, bottom and front walls transversely slotted for the passage therethrough of the baling-wires, of a follower constituting the rear wall of the chamber, the face of the follower being provided with vertical grooves disposed in the same vertical planes as the slots of the chamber, said grooves of the follower communicating with the interior space of the chamber through contracted longitudinal openings, and mechanism mounted above the chamber adapted to grip the baling-wires and tuck them through the slotted top and bottom walls of the chamber and the vertical grooves of the follower, substantially as described.

26. In a device of the character described, the combination with a power mechanism of means for transmitting a pull or stretch to a

point remote from the power comprising a plurality of strut-like supports constituting compression members arranged to abut each other and flexibly united by means of hollow or divided joints and a traveler-cable extending from the power mechanism substantially through the centers of said joints to the points of power application, whereby any substantial flexing moment of the cable upon the compression members is avoided when said members are arranged out of direct alignment with each other, substantially as described.

27. In a mechanism of the character described, the combination with a cam-block adapted to be continuously rotated and a fixed track disposed adjacent said cam-block and on the arc of a circle whose center is coincident with the pivotal axis of the cam-block, said track having one side thereof abruptly turned out of the arc of curvature of the track, of a traveler slidably engaging said track, and a fixed projection on the cam-block adapted to advance the traveler along the concentric portion of the track and to drop the traveler on the outwardly-turned end of the track, substantially as described.

28. A baling-press chamber having an outwardly-opening end door, and further having one of its sides formed by an outwardly-movable wall, in combination with obliquely-disposed links whereby said wall is hinged to a stationary external support, and locking means for said wall connected with the end door, said means locking the wall against outward movement when the door is closed, and releasing said wall when the door is opened, substantially as described.

29. In a baling-press, a baling-chamber one side of which is constituted by an upwardly-movable wall or cover, in combination with means connected to said wall and to a stationary part of the press-frame, said means serving to counteract the weight of the wall and tending to raise the same out of contact with the underlying bale to facilitate the withdrawal of the latter, substantially as described.

30. In a baling-press, a baling-chamber one side of which is constituted by an upwardly-movable wall or cover, in combination with a spring connected to said wall and to a stationary part of the press-frame, said spring serving to counteract the weight of the wall and tending to raise the same out of contact with the underlying bale to facilitate the withdrawal of the latter, substantially as described.

31. In a baling-press, a baling-chamber one side of which is constituted by an upwardly-movable wall or cover, in combination with obliquely-disposed links whereby said movable wall is hinged to an external stationary support, means for locking said wall against upward movement, and a spring connected to said wall and to a stationary member of the press-frame and serving to counteract the weight of the wall and to raise the latter out of contact with the underlying bale when the locking means are withdrawn, substantially as described.

JULIUS A. SPENCER.

Witnesses:

SAMUEL N. POND,
VINTON S. WRIGHT.