

(No Model.)

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F. X. MAURER.
AUTOMATIC HAY PRESS.

No. 406,455.

Patented July 9, 1889.

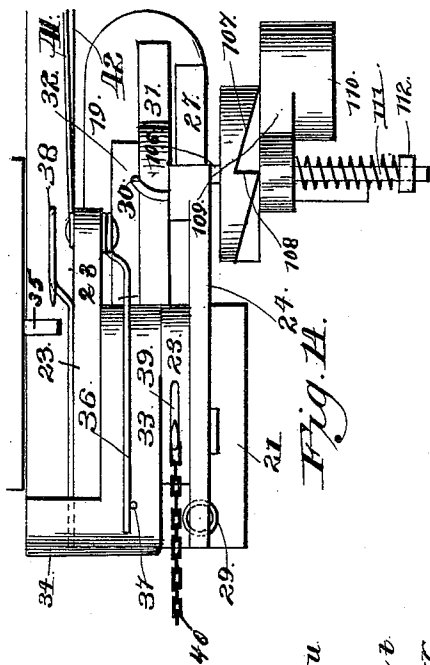


Fig. 11.

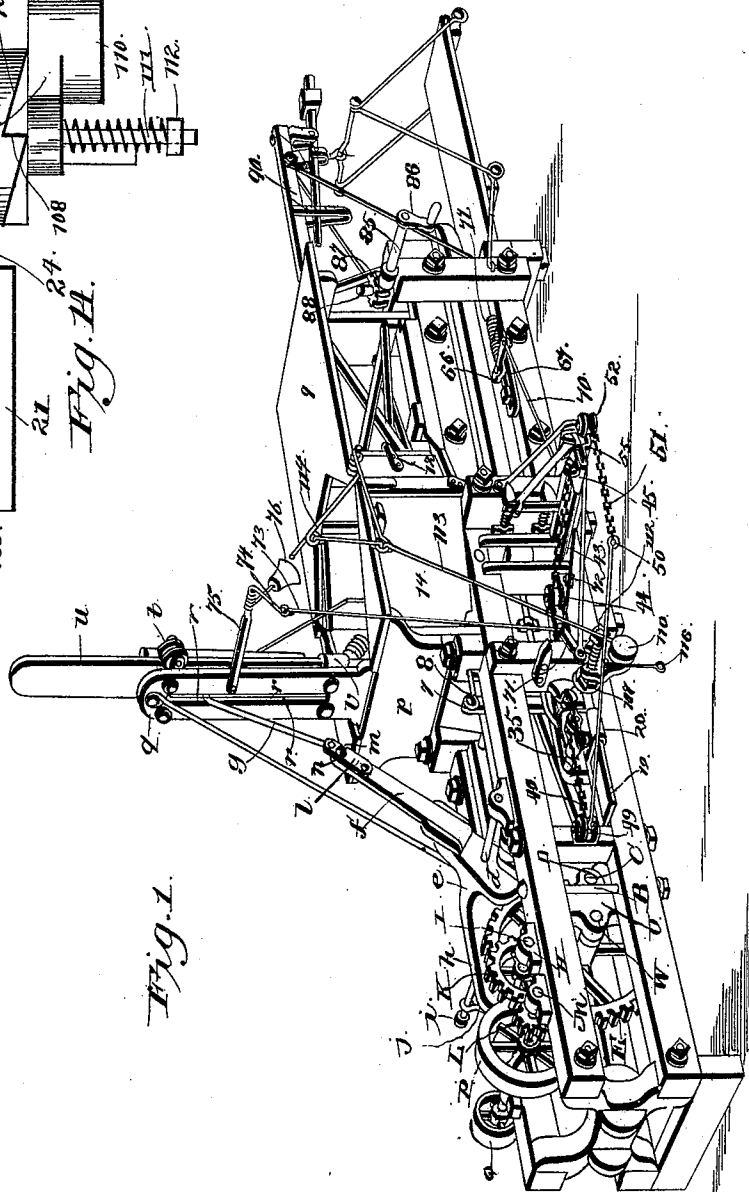


Fig. 1.

Witnesses

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C. A. Snow & Co.

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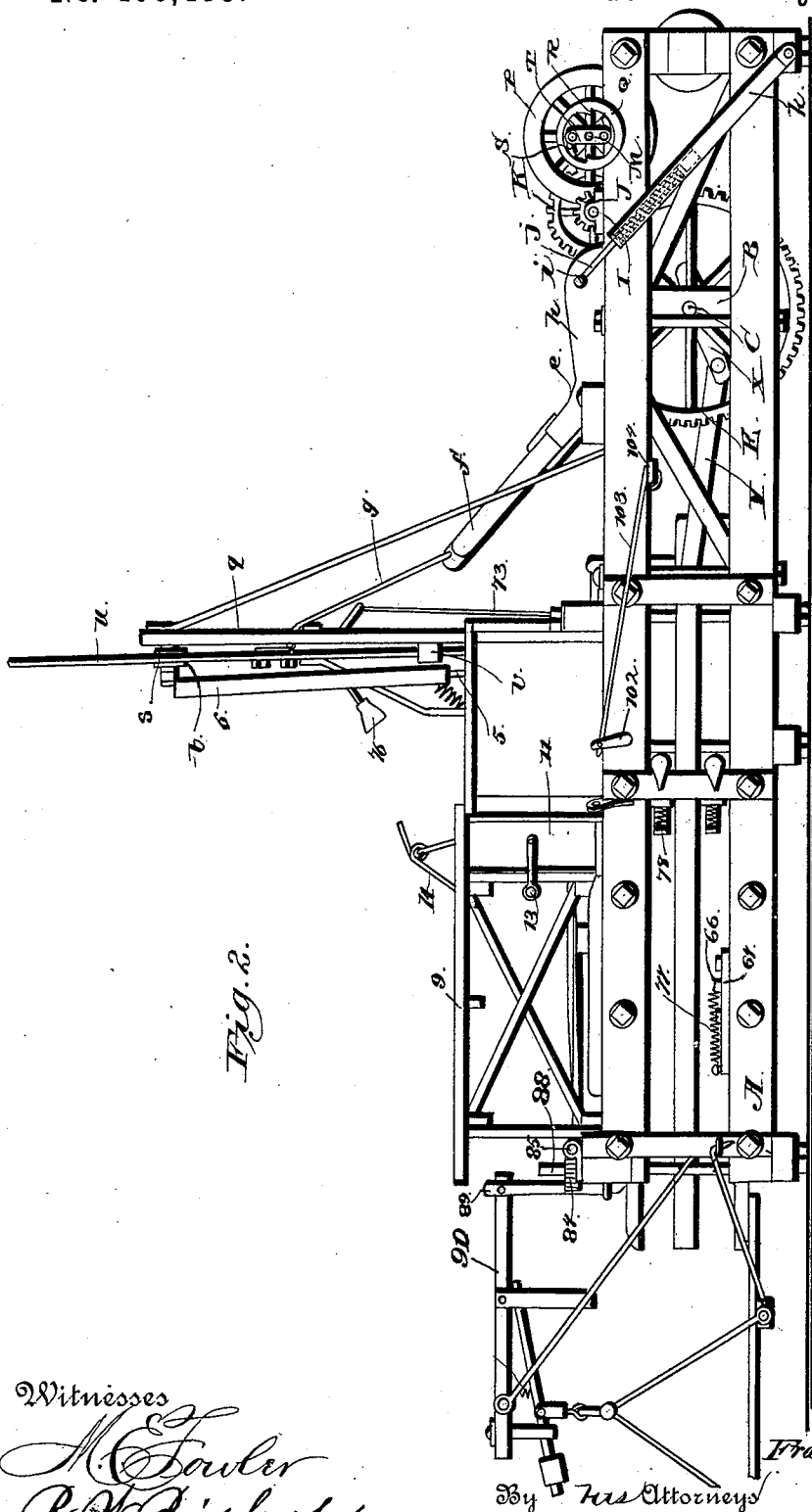


Fig. 2.

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Fig. 3.

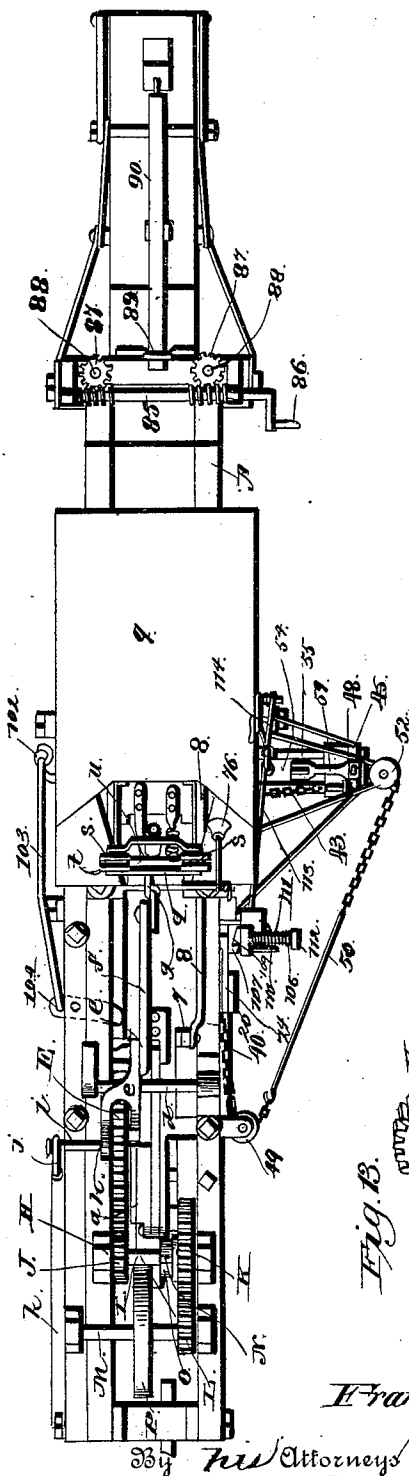
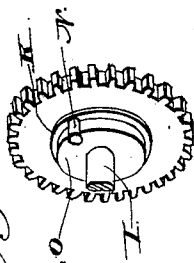


Fig. 13.



Witnesses

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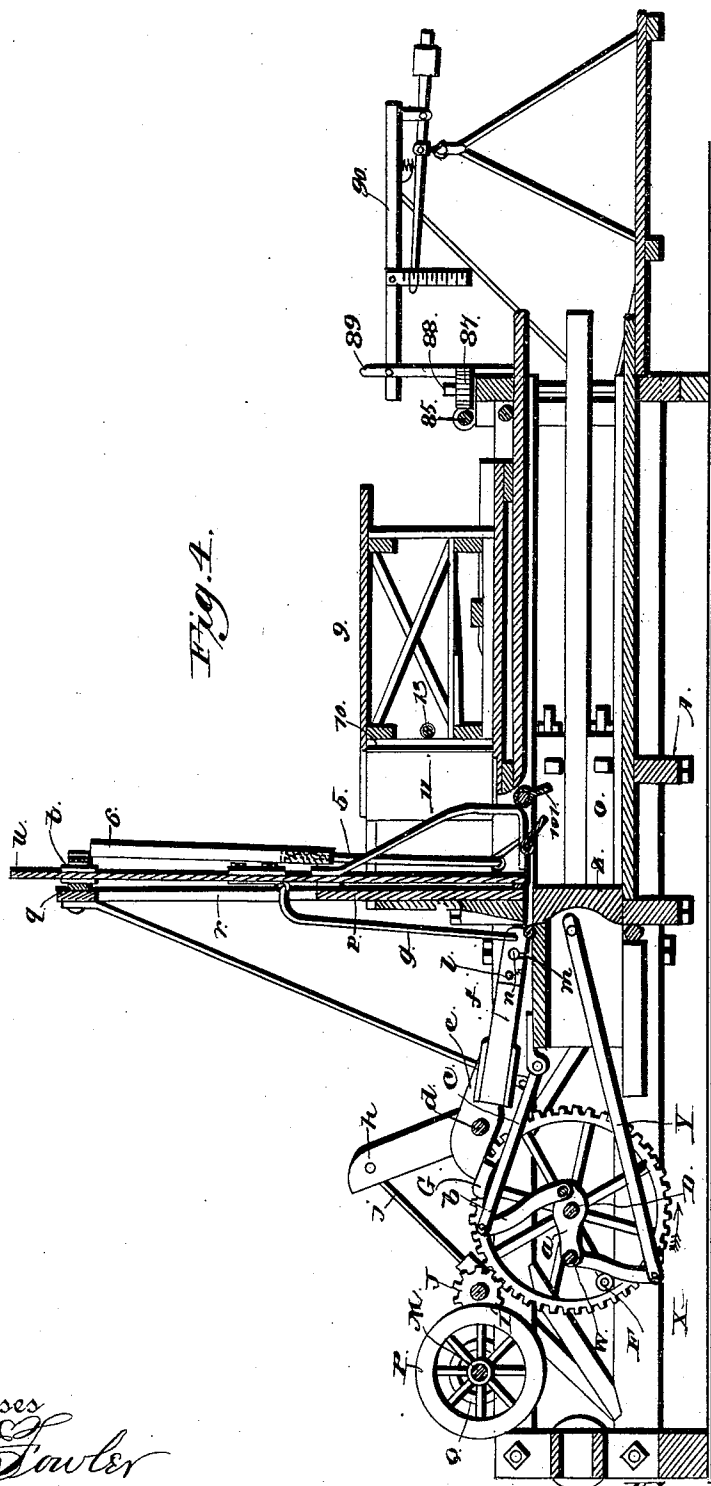
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Witnesses

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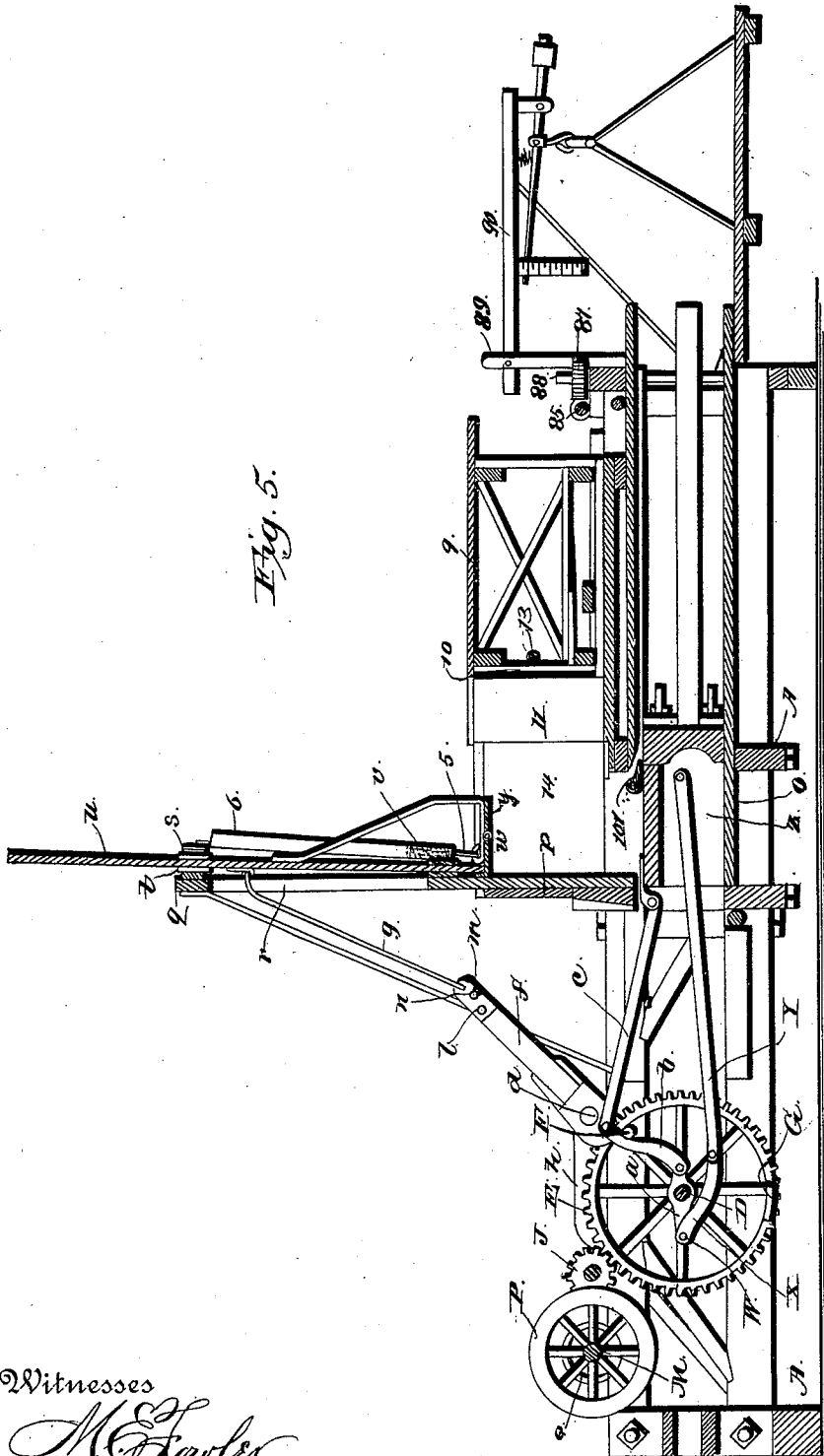
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Witnesses

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(No Model.)

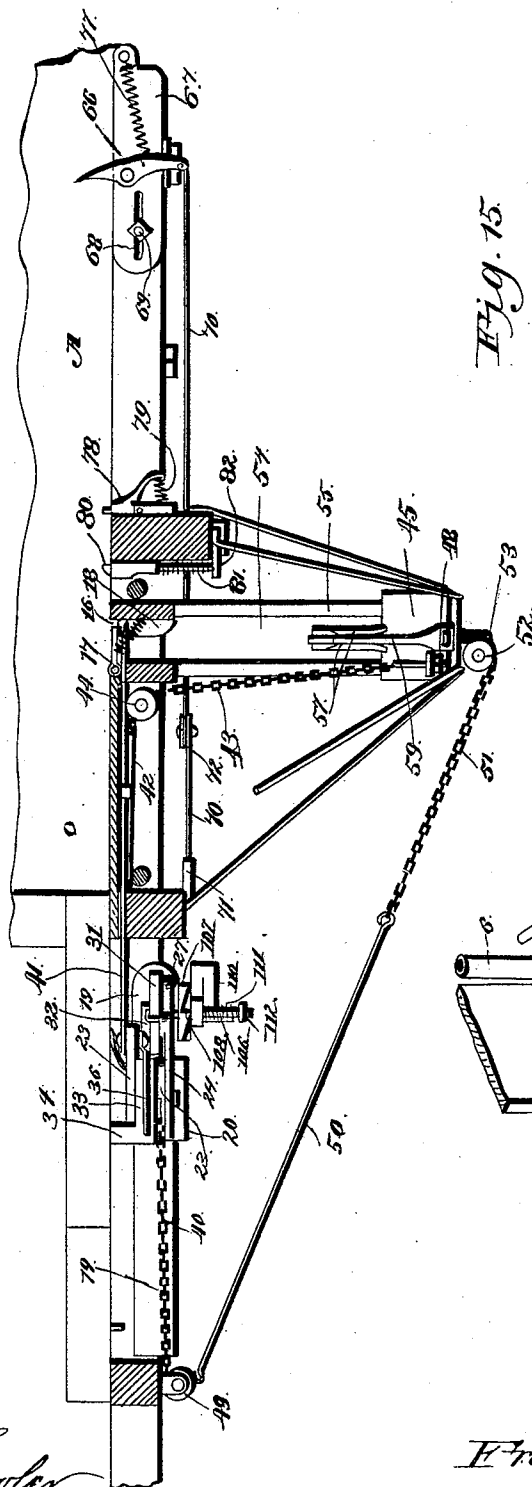
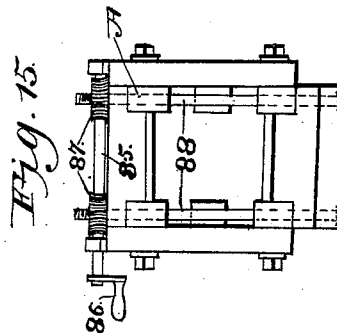
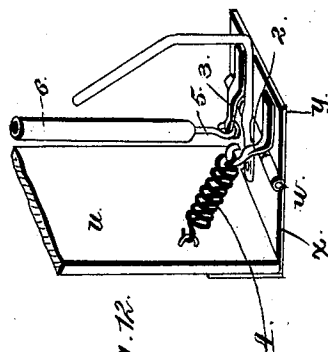
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Fig. 6.



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Fig. 11.

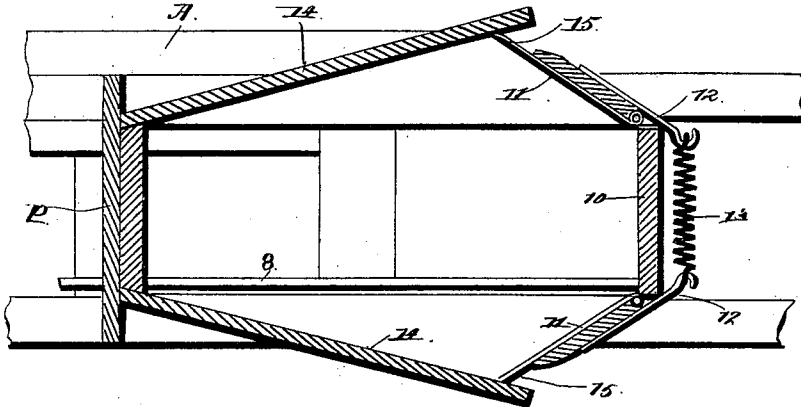


Fig. 7.

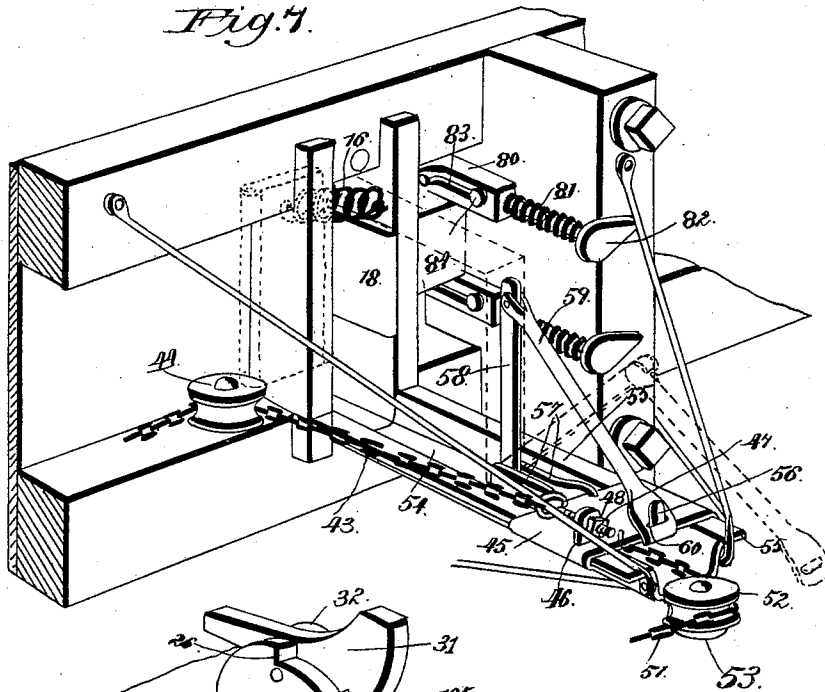
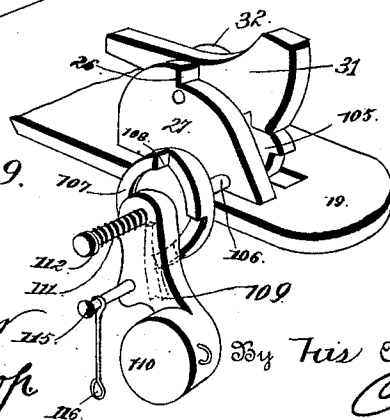


Fig. 9.



Witnesses

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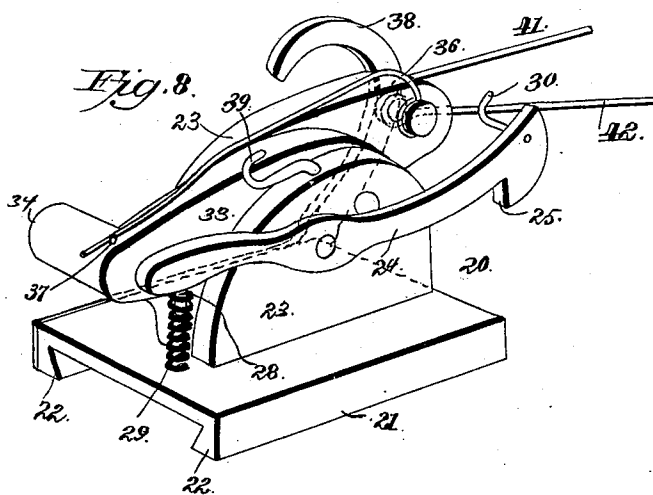
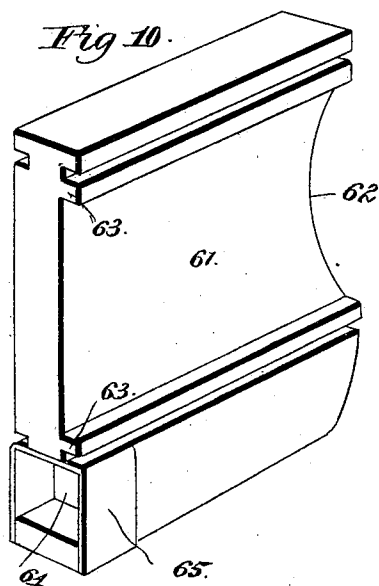
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Witnesses

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UNITED STATES PATENT OFFICE.

FRANK XAVIER MAURER, OF EAST ST. LOUIS, ILLINOIS.

AUTOMATIC HAY-PRESS.

SPECIFICATION forming part of Letters Patent No. 406,455, dated July 9, 1889.

Application filed August 28, 1888. Serial No. 283,962. (No model.)

To all whom it may concern:

Be it known that I, FRANK XAVIER MAURER, a citizen of the United States, residing at East St. Louis, in the county of St. Clair and State of Illinois, have invented new and useful Improvements in Automatic Hay-Presses, of which the following is a specification.

My invention relates to improvements in automatic hay-presses, and has special reference to improvements on the press for which Letters Patent No. 303,305 were granted to me August 12, 1884; and it consists in certain novel features hereinafter described and claimed.

The object of my present invention is to provide certain improvements in the operating mechanism whereby the plunger will be more efficiently reciprocated and breaking of any of the parts of the gearing will be prevented.

A further object of my invention is to provide an improved feed-box by means of which the hay will be compressed into a proper form before being acted upon by the rammer.

A further object of my invention is to provide a simple and efficient device by which the length of the bales may be regulated and an alarm sounded when the bale has been forced from the baling-chamber.

A further object of the invention is to provide an improved device for feeding the division-blocks into the press, and, finally, the object of my invention is to improve the construction and operation of the machine, as will be hereinafter fully set forth.

In the accompanying drawings, Figure 1 is a perspective view of a hay-press constructed in accordance with my invention. Fig. 2 is a side elevation of the same, looking at the side opposite that shown in Fig. 1. Fig. 3 is a plan view of the press. Fig. 4 is a central longitudinal vertical section showing the rammer lowered and the plunger as about to enter the baling-chamber. Fig. 5 is a view similar to Fig. 4, showing the rammer raised and the plunger forced in the baling-chamber. Fig. 6 is a detail horizontal section showing the devices for feeding the division-blocks into the baling-chamber, and also showing the lever which is operated by the

bale to sound an alarm. Fig. 7 is a detail perspective view of the lever for pushing in the division-blocks and its connections. Fig. 8 is a detail view of the sliding carriage which operates the lever shown in Fig. 7. Fig. 9 is a detail perspective view of the trip-hook for releasing the devices shown in Fig. 8. Fig. 10 is a detail perspective view of one of the division-blocks. Fig. 11 is a horizontal section of a portion of the feed-box. Fig. 12 is a detail perspective view of a portion of the rammer. Fig. 13 is a detail perspective view of the notched collar and the pin engaging the same. Fig. 14 is a detail view showing the mechanism for operating the sliding carriage. Fig. 15 is a detail end view to show the manner of contracting the rear or discharge end of the press.

Referring to the drawings by letter, A designates the main frame of my improved press, which is constructed substantially as shown in my above-mentioned patent, and may be mounted on rollers, as shown in said patent, as will be readily understood. Near the front end of the main frame I secure the standards B, having bearings C on their sides, in which is mounted the main shaft D. On this shaft D is secured a large gear-wheel E, having on one side near its periphery a wrist-pin F and a lug G, which are adapted to actuate the levers, hereinafter referred to, connected to the rammer and the plunger. On the upper sides of the longitudinal beams of the main frame are provided bearings H, in which is journaled a shaft I, having at one end a pinion J, meshing with the wheel E, and near its other end a gear-wheel K, which meshes with a pinion L on the driving-shaft M, which is also journaled in bearings on the upper side of the main frame. The gear-wheel K is secured loosely on the shaft I, and its hub is provided with a pin N, which engages a notched collar O on the said shaft, so that the motion of the wheel is communicated to the shaft. This pin is made of some frangible material, so that should the gearing bind or be otherwise obstructed in its movements the pin will break and allow the wheel to rotate loosely on the shaft, thus obviating the liability of breakage of any of the wheels or the shafts composing the driving-gearing. On

the shaft M, between the sides of the main frame, is mounted a balance-wheel P, and on its free end is mounted a band-pulley Q, which receives motion from any suitable motor, (not shown,) and thereby actuates the press. This band-pulley is mounted loosely on the shaft, and is provided on the inner side of its rim with two diametrically-opposite inwardly-projecting shoulders or teeth R, and the said shoulders or teeth are engaged by pawls S, pivoted to the ends of a plate T, secured rigidly on the shaft, so that the motion of the band-pulley is communicated to the press. Should it be desired for any reason to reverse the motor, this can be done without affecting the press, as the shoulders R will in that case slip over the pawls S without actuating the same.

Secured to one side of the standards B on the right-hand side of the press is a bearing-block U, in which is rigidly secured a shaft W, which projects inwardly a short distance, and has pivotally mounted upon it the outer end of a link X, forming a part of the lower toggle-lever Y, the inner end of the longer arm of said lever being pivoted to the plunger Z, as shown. To the inner end of the rigid shaft W is secured a plate *a*, which passes longitudinally of the press and terminates at a slight distance in the rear of the main shaft D, the said shaft passing through the plate, as shown. To the rear extremity of this plate is pivoted one end of a link *b*, forming the shorter arm of a toggle-lever C, the rear end of said toggle-lever being pivoted to an extension of the plunger Z, as shown. The links X and *b* are acted upon by the wrist-pin F to reciprocate the plunger in the operation of the press, as will be hereinafter more fully described.

On the upper side of the main frame, just in rear of the gear-wheel E, is secured a rigid shaft *d*, on which is pivoted an angle-lever *e*, having one arm *f* connected to the rammer through a link *g*, and having its other arm *h* normally resting on the upper side of the frame-work. The said arm *h* is provided with an outwardly-projecting pin *i*, to which is secured the upper end of a rod *j*, the lower end of which works in a cylinder *k*, pivotally secured to the side of the frame and containing a spring connected to the rod *j*, whereby the said rod will be drawn downward and the angle-lever restored to its normal position, after being acted upon by the lug G of the wheel E. The link *g* is not secured directly to the end of the arm *f* of the angle-lever, but is pivoted to the end of a plate *l*, having a notch *m* in its edge, which engages a pin *n*, secured on the end of the said arm *f*, as shown. By reason of this construction, should the rammer bind in its downward movement or should it strike a stone or other foreign substance in the hay, the plate *l* will swing upward, so that the parts will yield to the obstruction, and thereby prevent breaking of the rammer or any of its parts.

The baling-chamber *o* is formed at about the center of the main frame, as shown, and is open at its ends and closed on its sides, as will be readily understood. At the front end of the baling-chamber I secure to the upper side of the frame-work a cross-plate *p*, which forms the front end of the feed-chamber, and has a standard *q* secured to its upper edge and projecting upward therefrom. The standard *q* is provided with a longitudinal slot *r*, through which the upper end of the link *g* projects and in which it plays. To the upper end of the standard *q*, on its rear side, is secured a guide-bracket *s*, having rollers *t* at its ends, which receive and guide the rammer *u*. The standard is further provided, near its lower end, with the U-shaped guides *v*, which receive the edges of the rammer *u*, and aid the bracket *s* in guiding the same. The end of the link *g* is secured to the front side of the rammer, and to the lower end of the rammer is secured the rammer-plate *w*, (see Fig. 12,) consisting of the rigid section *x*, securely fastened to the end of the rammer, and the swinging section *y*, hinged to the free edge of the rigid section. The said swinging section is provided on its upper side with the hooks 2 3, which project forward and slightly over the rigid section. The hook 2 is engaged by the end of a spring 4, having its opposite end secured to the rammer *u*, and serving to hold the swinging section normally in its raised position. The hook 3 is engaged by the lower hooked end of a rod 5, which projects upward into a tube 6, and is acted upon by a coiled spring contained in said tube. As the rammer descends, the spring in the tube 6 will be compressed by the head of the rod 5, so that when the rammer is near the lower limit of its movement the spring will exert a tension on the said rod and thereby force the same upward, drawing on the hook 3, and thereby turning the swinging section *y* to the position shown in Fig. 4. This movement causes the hay to be firmly packed in front of the plunger before it begins its movement.

To the upper side of the plunger, at the front end of the same, is secured a short arm 7, (see Figs. 1 and 3,) and to the end of said arm is secured the front end of a connecting-rod 8, the rear end of which is secured to the feed box or table 9. By this construction the feed box or table reciprocates simultaneously and in the same direction with the plunger. The said feed box or table is mounted on the upper side of the main frame and is provided at its front end with a vertical plate 10 of about the same width as the baling-chamber, and having hinged to its edges the leaves or wings 11, which are provided on their rear sides with the inwardly-projecting hooks 12, having a coiled spring 13 extending between the same. This coiled spring serves to draw the front outer ends of the leaves normally apart, so that they will bear upon the inner sides of the rearwardly-diverging boards 14, extend-

ing from the cross-plate *p*. By this construction, as the feed-box is drawn toward the front end of the frame, the leaves will be caused to swing together by the boards 14, so that the hay will be pressed into a square form before being dropped into the baling-chamber, and as the feed-box is drawn toward the rear end of the press the spring 13, acting on the hooks 12, will draw the leaves apart, so that they will be in position to receive another charge of hay. These leaves are faced with metal plates 15, as clearly shown in Fig. 11, to reinforce and strengthen them.

On the right-hand side of the baling-chamber, in the frame-work, is provided an opening 16, which is normally closed by a spring-actuated door 17, as shown most clearly in Fig. 6. On one side of the opening 16 is secured a block 18, for a purpose presently to be referred to. On the right-hand side of the frame-work, in advance of the baling-chamber and between the same and the gearing, is secured a guide rail or plate 19, on which is mounted a sliding carriage 20. (See Fig. 8.) This carriage 20 consists of a base-plate 21, having longitudinal ribs 22 on its under side, which engage the edges of the guide plate or rail 19. On the upper side of the said base-plate are formed lugs or ears 23, as shown. To the outer side of the outer ear is pivoted a pawl or hook 24, having its front end provided with a shoulder or latch 25, which is adapted to engage a shoulder 26, formed on the upper edge of a lug 27 erected on the upper side of the guide-plate 19 at the rear end of the same. (See Fig. 9.) The front end of the pawl 24 is provided with a depending pin 28, which enters the upper portion of a coiled spring 29, which bears between the pawl and the base-plate, and thereby serves to hold the rear end of said pawl normally lowered. The rear end of the pawl is further provided with an inwardly-standing pin 30, which is adapted to act upon the upper side of a trip-hook 31, pivoted between the lug 27 and a parallel lug 32 on the guide-plate 19. Between the two lugs or ears 23, I pivot a trigger 33, which is provided at its front end with an inwardly-projecting arm 34, adapted to be engaged by a pin 35 on the plunger in the operation of the device. This trigger 33 has its front end normally depressed by a spring 36, secured to the rear end of the inner lug 23 and bearing on the trigger. This spring is prevented from slipping laterally from the trigger by means of a pin 37, projecting upward from the same, as clearly shown in Fig. 8. To the inner side of the inner lug 23 is secured a hook 38, which is engaged by the pin 35, projecting from the plunger. To the upper side of the outer lug 23 is secured a hook 39, which is engaged by a chain 40, and to the inner side of the inner lug 23, at the rear end of the same, are secured the ends of a needle 41 and a connecting-rod 42. The needle 41 is adapted to extend across the opening 16, and thereby prevent the pre-

ture entrance of the division-block into the baling-chamber. The end of the connecting-rod 42 is secured to a chain 43, which passes around a pulley 44, journaled on the side of the main frame, and is connected to a sliding plate 45, as most clearly shown in Fig. 7. The said plate 45 is provided on its upper side with a lug 46, through which is inserted a pin 47, connected to the chain 43, and having its end screw-threaded and provided with a securing-nut 48, which is turned up against the offset 46, to secure the pin therein and also to take up slack in the chain. The chain 40 passes around a pulley 49, mounted on the side of the main frame, and is secured to a connecting-rod 50, the said connecting-rod extending outward and rearward to a chain 51, which passes around a pulley 52 and is connected to the sliding plate 45. The pulley 52 is journaled on an extension 53 of the guide-trough 54, which extends laterally from the side of the main frame in alignment with the opening 16. This guide-trough is provided with the horizontal flanges 55 at its sides, which are engaged by the sliding plate 45, and support and guide the said plate in its movement. The said plate is actuated simultaneously with the plunger by means of the sliding carriage 20, and the connecting-rods and chains between the said carriage and the plate, as will be presently fully described.

At the outer edge of the sliding plate 45 is a small lip 56, and at its inner edge the said plate is provided with the inwardly-projecting arms 57, between the inner extremities of which is pivoted a standard 58, and to the upper end of this standard is pivoted one end of a rod 59, the opposite end of which rod is provided with an opening 60, which is adapted to engage the lip 56, and thereby hold the standard 58 in a vertical position, as shown in Fig. 1 and in full lines in Fig. 7. When it is desired to insert a division-block into the press, this standard and the rod are drawn downward to the position shown in dotted lines in Fig. 7, after which the division-block can be readily placed in position in the guide-trough 54, as indicated in dotted lines in said Fig. 7. The rod and standard are then restored to their former positions and hold the division-block in place, so that when the slide plate 45 is drawn toward the press the division-block will be forced thereinto, as will be presently described.

61 designates one of the division-blocks just referred to. One edge of the division-block is cut away, as shown at 62, so that should the hay accumulate in the baling-chamber and tend to bind against the sides of the same it can readily slip through the space between the side of the baling-chamber and the cut-away edge of the division-block, so as not to interfere with the steady operation of the press. One side of the division-block is provided with the projecting ribs 63, which are adapted to engage the upper and lower edges of the block 18, and thereby in-

sure the blocks being inserted in the guide-trough 54 in proper position to enter the baling-chamber. Near its lower edge one of the ends of the division-block is provided with a recess 64, which is adapted to slip over the inner ends of the arms 57, when the division-block is being placed in the trough 54, and engage the ends of said arms, so as to be held in an upright position. This recess 64 is inclosed by a metallic strip 65, which is adapted to act upon the inwardly-projecting end of a lever 66 as the bales are discharged from the baling-chamber.

The lever 66, just referred to, is pivoted upon a plate 67, which is secured to the main frame-work, and is provided with the longitudinal slots 68, through which securing-bolts 69 are inserted into the main frame, so as to adjustably secure the said plate 67 thereto. The lever 66 has its outer end projecting from the side of the frame-work and pivoted to the rear end of a connecting-rod 70, the front end of which is pivoted to a lever 71, the latter being pivoted to the side of the main frame. This connecting-rod 70 is made in two sections or members, the adjacent ends of which are connected by a clamp 72, so that the said connecting-rod can be readily lengthened or shortened to accommodate it to the position of the plate 67 and the lever 66, carried thereby. The lever 71 is connected through a pitman 73 with an angle-lever 74, mounted at its angle upon an arm 75, extending laterally from the standard *g*. Said lever 74 carries a bell 76 on its free end.

By the mechanism just described an alarm is sounded every time a bale is forced from the baling-chamber. The lever 66 has its outer end normally drawn rearwardly by means of a spring 77, having its opposite ends secured, respectively, to the said lever and the plate 67.

The length of the bales, it will be understood, is determined by the interval between the division-blocks, so that if the operator inserts a division-block into the press only after each alternate charge of hay the bale will comprise two charges. In a similar manner the bale can be made to contain three or more charges. The plate 67 is secured on the frame of the press at such a point that the alarm will be sounded as the last charge is expelled from the baling-chamber, thus notifying the operator that the bale has been formed and that another division-block should be placed in the press. It will thus be seen that I am enabled to form bales of any desired length without any radical changes in the press.

78 designates spring-actuated stops, (see Fig. 6,) which are pivoted to the sides of one of the posts or standards of the main frame, and have their inner ends normally projected into the path of the bale by coiled springs 79, bearing against the outer ends of the stops and the sides of the posts or standards to which they are pivoted.

80 designates sliding stops secured to the

sides of the standards or posts of the main frame and normally projected into the path of the bales by coiled springs 81, bearing between the outer ends of the stops and lugs 82 secured to the posts or standards. The stops 80 are provided with longitudinal slots 83, through which are passed guide-pins 84, so that the said stops are maintained in a horizontal position. These stops 78 80 prevent retrograde movement of the bales and the loose material. The stops 78 hold the solid pressed material which has been forced from the baling-chamber, and the sliding stops 80 hold the last charge placed in the baling-chamber.

85 designates a transverse worm-shaft mounted on the upper side of the main frame at the rear end of the same, and provided with a crank-handle 86. This worm-shaft 85 meshes with the worm-pinions 87 on the upper ends of vertical screw-shafts 88, extending through the ends of the frame-work.

By turning the worm-shaft in one direction the pinions will be caused to ride down the shafts 88, so as to bear upon the roof of the press and lower the same, while by turning the worm-shaft in the opposite direction the roof will be allowed to rise. In this manner the discharge of the bales from the press can be regulated, as will be readily understood.

On the upper side of the main frame, at the rear end thereof, I erect a standard 89, to the upper end of which is secured a rearwardly-projecting beam 90, which supports a scale adapted to weigh the bales as they are discharged from the press.

101 designates a lapper secured on a rock-shaft extending transversely through the baling-chamber above the path of the plunger and projecting beyond one side of the press. The free end of this rock-shaft is provided with a crank-arm 102, which is connected by a rod 103 with a lever 104, pivoted to the main frame near the front limit of the travel of the plunger and projecting into the path of the same, so that the lapper will be operated by the plunger. This lapper serves to give the bale a smooth upper surface as it is forced from the baling-chamber.

The trip-hook 31 has its front end extended and adapted to bear against the under side of the trigger 33, and has its rear end projected upward and adapted to be actuated by the pin 30 on the pawl 24, so that when the carriage 20 is drawn rearwardly the said pin 30 will engage with the rear end of the trip-hook, raising the front end thereof, so that it will engage with the under side of the trigger 33 and thereby raise the same. The said trip-hook 31 rests on a ratchet-wheel 105, secured on the inner end of a shaft 106, journaled in the lug 27 and extending outward therefrom. On the said shaft 106 is secured a disk 107, having teeth 108 formed on its outer face and adapted to be engaged by a lug 109 on the inner side of a weighted lever 110, loosely

hung on the shaft 106, and held in engagement with the said teeth 108 by means of a spring 111, coiled around the shaft 106 between the lever 110 and a shoulder 112 on the extremity of the said shaft 106. The lever 110 is connected by a pitman 113 to a bell-crank lever 114, pivoted on the outer side of one of the boards 14 above the baling-chamber.

When the bales are discharged from the baling-chamber, they sound an alarm through the medium of the lever 66, the bell 76, and the connections between the two, so that the operator is notified that the bale has been formed. The bell-crank lever 114 is then turned, so as to raise the weighted lever 110, thereby releasing the pawl 24, so that the carriage 20 can be drawn toward the front end of the press by the plunger, and the plate 45 drawn toward the press to feed a division-block thereinto.

The lever 110 is provided with a pin 115 and a link 116, so that if so desired the said lever may be connected directly to the lever 66 in order that the pawl may be automatically released as the bales are discharged. I prefer, however, to release the said pawl by the mechanism shown and just described, as the operator can then allow the plunger to reciprocate at will in order to clear the baling-chamber of loose hay before feeding another charge thereto.

In operation the operator stands at the right-hand side of the press and feeds the hay into the feed-chamber formed by the space between the feed-box 9 and the cross-plate *p* by means of a pitchfork, as will be readily understood. The press is continuously operated from any suitable motor, so as to impart a rotary motion to the gear-wheel E, which is thereby caused to carry the wrist-pin F against the inner sides of the links X and *b* alternately, as will be readily understood. As the said wrist-pin acts upon the link X, the plunger will be forced rearwardly into the baling-chamber, and the feed chamber or box 9 simultaneously carried toward the rear end of the press. The pin 35 on the side of the plunger engages with the hook 38, and thereby draws the carriage 20 toward the rear end of the press at the same time, and the said carriage 20 draws the sliding plate 45 away from the press through its connections with said plate, as before stated. As the plunger reaches the rearward limit of its stroke, the rear end of the pawl 24 rides over and engages the shoulder 26 of the lug 27, and thereby locks the carriage 20 against forward movement. When the rear end of the pawl falls into engagement with the shoulder 26, the pin 30 will be brought against the upper side of the trip-hook 31, thereby depressing the rear end thereof and consequently throwing the front end of the same upward against the trigger 33, so as to raise the same. When the parts are in this position, the needle 41 will be projected across the opening 16,

as shown in Fig. 6, thereby preventing the entrance of the division-blocks into the press, as before stated. The operator then turns the bell-crank lever 114, so as to raise the lever 110, thereby rotating the disk 107, and through it the shaft 106, consequently causing the ratchet-wheel 105 to raise the rear end of the trip-hook 31. The front end of the trip-hook 31 is at the same time lowered, so that the pawl 24 will be disengaged from the shoulder 26, and the trigger 33 simultaneously lowered, so that its arm 34 will be in the path of the pin 35 on the plunger. As the gear-wheel E continues to revolve, the wrist-pin F will strike against the link *b* and actuate the same to withdraw the plunger. At the same time the pin 35 on the plunger, acting against the arm 34 of the trigger 33, will draw the carriage 20 toward the front end of the press, and the said carriage will cause the sliding plate 45 and the lever 59, carried thereby, to travel toward the press. As the wrist-pin F leaves the link *b*, the lug G will strike against the end of the arm *f* of the angle-lever *c*, and thereby lower the upper or rear end of the said arm *f*, causing the rammer to be lowered, and thereby force the hay into the baling-chamber, as before stated. This lug G is of such a length as to hold the rammer lowered during the entire period that the wrist-pin is passing from the link *b* to the link X and until the plunger has traveled about half-way across the baling-chamber, so that the hay will be positively acted upon and none of it will be lost. As the plunger is forced inward, the rod 59 is drawn outward and the bale discharged from the baling-chamber. The feed-box 9 is at the same time carried rearward, so that a new charge of hay can be placed in front of the same. As the bale is discharged, it operates the lever 66, as before stated, to sound an alarm, and the operator then releases the pawl 24 in the manner described, so that the carriage can be drawn toward the front end of the press on the return-stroke of the plunger, as before stated. Before the plunger starts on its return-stroke, however, the rod 59 and the standard 58 are turned down, as indicated in dotted lines in Fig. 7 and before described, and a division-block placed in the trough 54. I prefer in operation to allow the plunger to make each alternate stroke without feeding another charge of hay to the press and without releasing the pawl 24, as I am thereby enabled to clear up all the loose hay in the baling-chamber, and also secure ample time to feed the division-blocks into the press. As the plunger is withdrawn from the baling-chamber, the feed-box is drawn forward, compressing the hay in front of the same by means of its wings or leaves 11, as before stated, and shoving the same under the rammer. Just as the feed-box and the plunger reach the forward limit of their stroke the rammer begins its downward movement and the hay falls into the baling-chamber and is packed in front of the plunger.

The door 17 is normally closed, as shown in Fig. 6, so as to prevent the hay passing out from the side of the baling-chamber. When the division-block is fed into the press, it passes under the spring and pushes against the door, so that the door yields or opens, but at the same time presses against the division-block, so as to hold it in a vertical position, and as soon as the block is entirely within the baling-chamber the said door automatically closes, so that the baling-chamber will be complete.

The alarm is sounded by reason of the division-block striking against the inwardly-projecting end of the lever 66, which is thereby carried rearwardly and slips into the recess 64 of the division-block, thereby vibrating the connections between the said lever and the bell, causing the said bell to ring.

From the foregoing description, taken in connection with the accompanying drawings, it will be seen that I have provided a very efficient press, by means of which the hay will be compactly baled, and by which loss of the hay will be prevented.

The device is automatic in nearly all of its movements, and can be made entirely automatic.

While the device acts upon the entire quantity of hay, it is free from unnecessary complicated combination and arrangement of parts, and the several mechanisms are very compactly arranged.

Having thus described my invention, what I claim, and desire to secure by Letters Patent, is—

1. In a hay-press, the combination, with the main frame, of the plunger, the driving mechanism having the wheel E provided with wrist-pin F, and the toggle-levers acted upon by said wrist-pin and having their rear ends pivoted to the plunger and their front ends pivotally supported on opposite sides of the center of the wheel E, as set forth.

2. The combination, with the main frame, of the plunger, the toggle-levers having their outer ends pivoted to the plunger, the rammer, the angle-lever connected to the rammer, and the driving mechanism having the gear-wheel E, provided with the wrist-pin F, to act on the toggle-levers, and the lug G, to act on the angle-lever, as set forth.

3. The combination, with the main frame, of the rammer, the angle-lever connected to the rammer, the pin projecting from the angle-lever, the tube pivoted to the frame, the rod connected to the pin projecting from the angle-lever and extending into said tube, the spring in said tube acting on said rod, and mechanism for operating the angle-lever, as set forth.

4. In a hay-press, the combination of the rammer, the angle-lever, the plate pivoted to the angle-lever and having a notched edge engaging a pin on the angle-lever, a link connecting said plate with the rammer, and

mechanism for operating the angle-lever, as set forth.

5. The combination, with the main frame, of the plunger, the sliding carriage actuated by the plunger, the transversely-sliding plate operated by the carriage, connections between the sliding plate and the carriage, and mechanism for reciprocating the plunger, as set forth.

6. The combination, with the main frame and the guide-trough projecting laterally from the main frame, of the plunger, the sliding plate mounted on the guide-trough, intermediate devices between the plunger and the sliding plate, whereby the sliding plate will be moved along the guide-trough by the plunger, and suitable operating mechanism, as set forth.

7. The combination, with the main frame, of the plunger, the sliding carriage mounted on the main frame and actuated by the plunger, the guide-trough projecting from the main frame, the transversely-sliding plate thereon, connections between said plate and the carriage, and suitable operating mechanism, as set forth.

8. The combination, with the main frame having a vertical opening 16 in its side, of the plunger, the sliding carriage actuated thereby, the needle carried by the carriage and projected thereby across the said opening 16, the sliding plate adapted to be moved to and from said opening, connections between said plate and the carriage, and mechanism for reciprocating the plunger, as set forth.

9. The combination, with the main frame, of the plunger, the transversely-sliding plate, the sliding carriage actuated by the plunger and connected to said plate, the trip-hook on the main frame and adapted to be engaged by the carriage, devices for releasing said trip-hook, and mechanism for actuating the plunger, as set forth.

10. The combination, with the main frame, of the plunger, the carriage mounted on the main frame and having the hook 38, and the trigger 33, adapted to be alternately engaged by the plunger, the sliding plate connected to the carriage, and mechanism for operating the plunger, as set forth.

11. The combination, with the main frame, of the sliding plate, the carriage mounted on the main frame and having the pawl 24, and the trigger 33, and the hook 38, the pin 35, projecting from the plunger and adapted to engage the trigger 33 and the hook 38 alternately, mechanism for actuating the plunger, and devices for locking the carriage and releasing the same, as set forth.

12. The combination, with the main frame, of the plunger, the carriage actuated thereby and having the pawl 24, the lug 27, having a shoulder 26 engaged by said pawl, the trip-hook adapted to release said pawl from said lug, the rock-shaft 106, having the ratchet-wheel 105 adapted to actuate said trip-hook,

and mechanism for rotating said shaft, as set forth.

13. The combination, with the main frame, of the trough 54, projecting from one side of the same, the sliding plate mounted on said trough, the plunger, the sliding carriage actuated thereby and connected with the sliding plate, mechanism for operating the plunger, the standard pivoted to the sliding plate, and the rod pivoted to the standard and adapted to engage said plate, as set forth.

14. The combination, with the main frame, of the guide-trough projecting from the same, the sliding plate mounted on said trough, the arms 57, projecting inward from said plate, the lip 56 at the outer edge of said plate, the standard pivoted to the arms 57, the rod pivoted to said standard and engaging the lip 56, the plunger, the sliding carriage actuated by the plunger and connected with the sliding plate, and mechanism for operating the plunger, as set forth.

15. The combination, with the main frame, of the plunger, the trough projecting therefrom, the sliding plate 45, mounted thereon, the carriage mounted on the main frame and actuated by the plunger, the chains 40 and 51, and the rod 50, extending between the plate and the carriage, the rod 42, extending from the carriage, and the chain 43, secured to said rod and adjustably connected to the sliding plate, as set forth.

16. The combination, in a hay-press, of the main frame, the lever 71, pivoted on the side of the frame, the lever 66, mounted on the frame, a connecting-rod between the levers 66 and 71, a bell supported above the framework, and connections between said bell and the lever 71, as set forth.

17. The combination, with the main frame, of the standard erected thereon, the arm projecting from said standard, the angle-lever fulcrumed on said arm and carrying a bell, the lever 71, pivoted on the main frame, connections between the lever 71 and the angle-lever, the lever 66, fulcrumed on the main frame, and a rod connecting the said lever and the lever 71, as set forth.

18. The combination of the rammer *u*, the

rammer-plate comprising the rigid section *x*, secured to the rammer, and the swinging section *y*, hinged to the rigid section, the spring secured to the rammer, and the swinging section of the rammer-plate, the tube, the rod playing in said tube and connected to the swinging section of the rammer-plate, and the spring in the tube controlling said rod, as set forth.

19. The combination, with the main frame, of the rearwardly-diverging boards 14 on the upper side of the same, the feed-table having the swinging leaves bearing against said diverging boards, the spring between the leaves, and mechanism for operating the feed-box, as set forth.

20. The improved feed-box having the leaves 11, the hooks 12 on the rear side of said leaves, and the spring 13 between said hooks, substantially as specified.

21. The combination, with the main frame having a vertical opening in one side, of the block 18, secured to the rear wall of said opening, the division-block having a plain front side and provided on its rear side with horizontal ribs 63 adapted to engage the upper and lower edges of the said block 18, and mechanism for pushing said division-block through the said opening 16, as set forth.

22. The combination, with the main frame having the opening 16, and the block 18, secured to the rear side of said opening, of the horizontal lever 66, mounted on the main frame and longitudinally adjustable thereon, said lever being adapted to sound an alarm, the division-block adapted to pass through the opening 16, and having the ribs 63 adapted to engage the block 18, and provided with the recess 64 in its lower corner adapted to operate the lever 66, and mechanism for pushing the division-block through the opening 16, as set forth.

In testimony that I claim the foregoing as my own I have hereto affixed my signature in presence of two witnesses.

FRANK XAVIER MAURER.

Witnesses:

M. G. HEIM,

AUGUST R. MENGLIR.