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N. B. WOOD.

SELF BINDING STRAW COMPRESSOR.

No. 367,490. Patented Aug. 2, 1887.

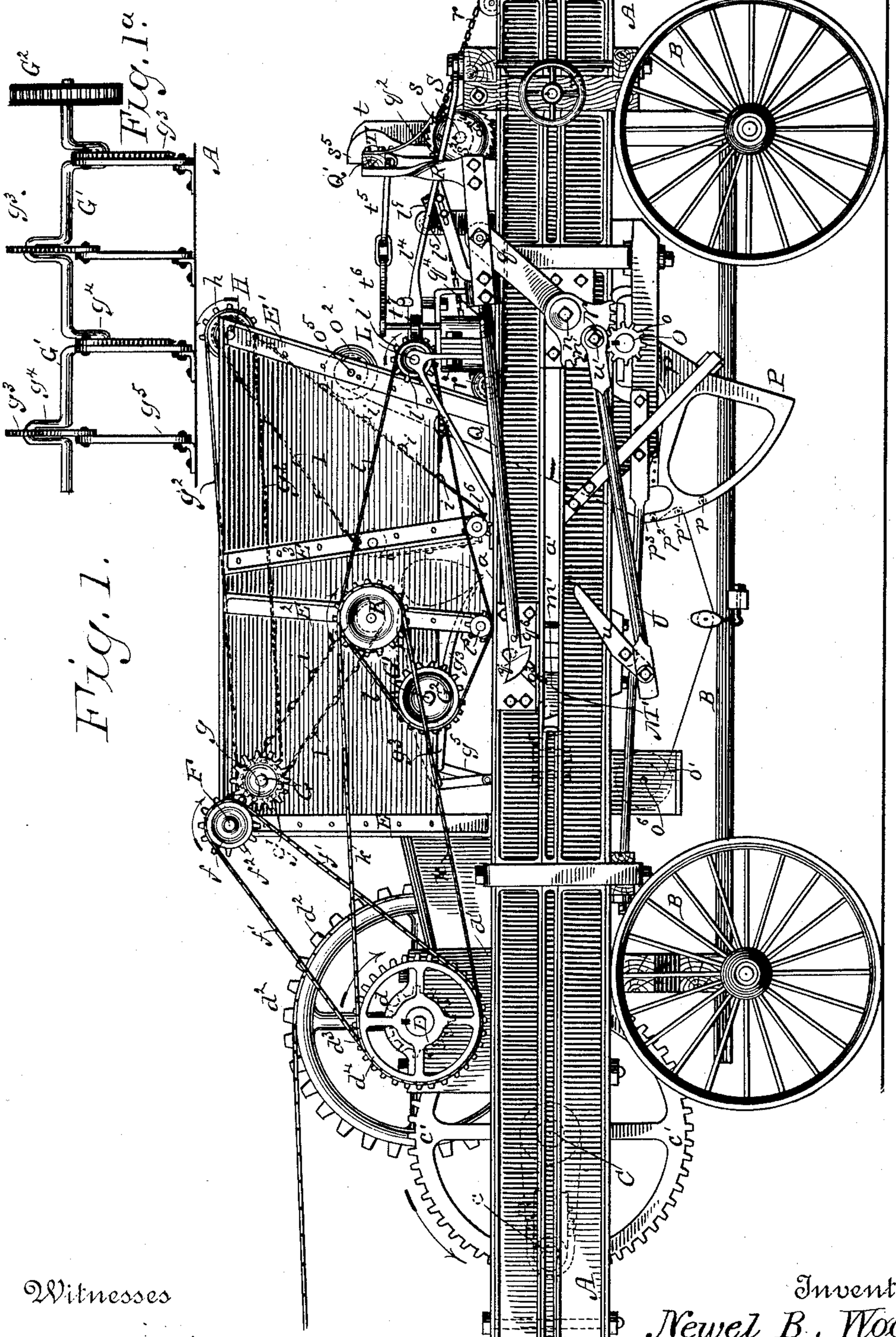

Fig. 1.

Witnesses

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Inventor

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By his Attorney D. A. Seymour

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N. B. WOOD.

SELF BINDING STRAW COMPRESSOR.

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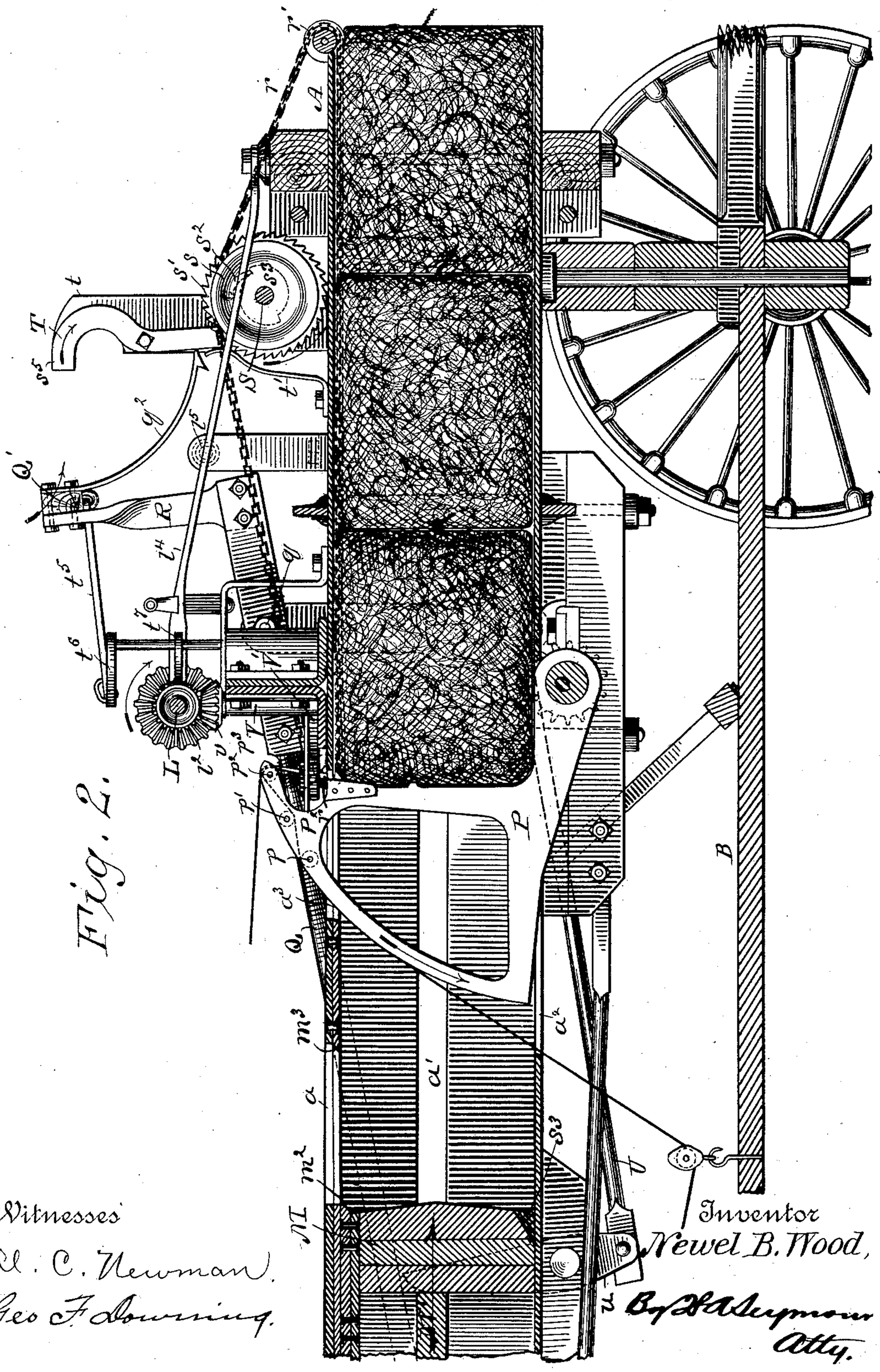

Fig. 2.

Witnesses
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(No Model.) 5 Sheets—Sheet 3.

N. B. WOOD.

SELF BINDING STRAW COMPRESSOR.

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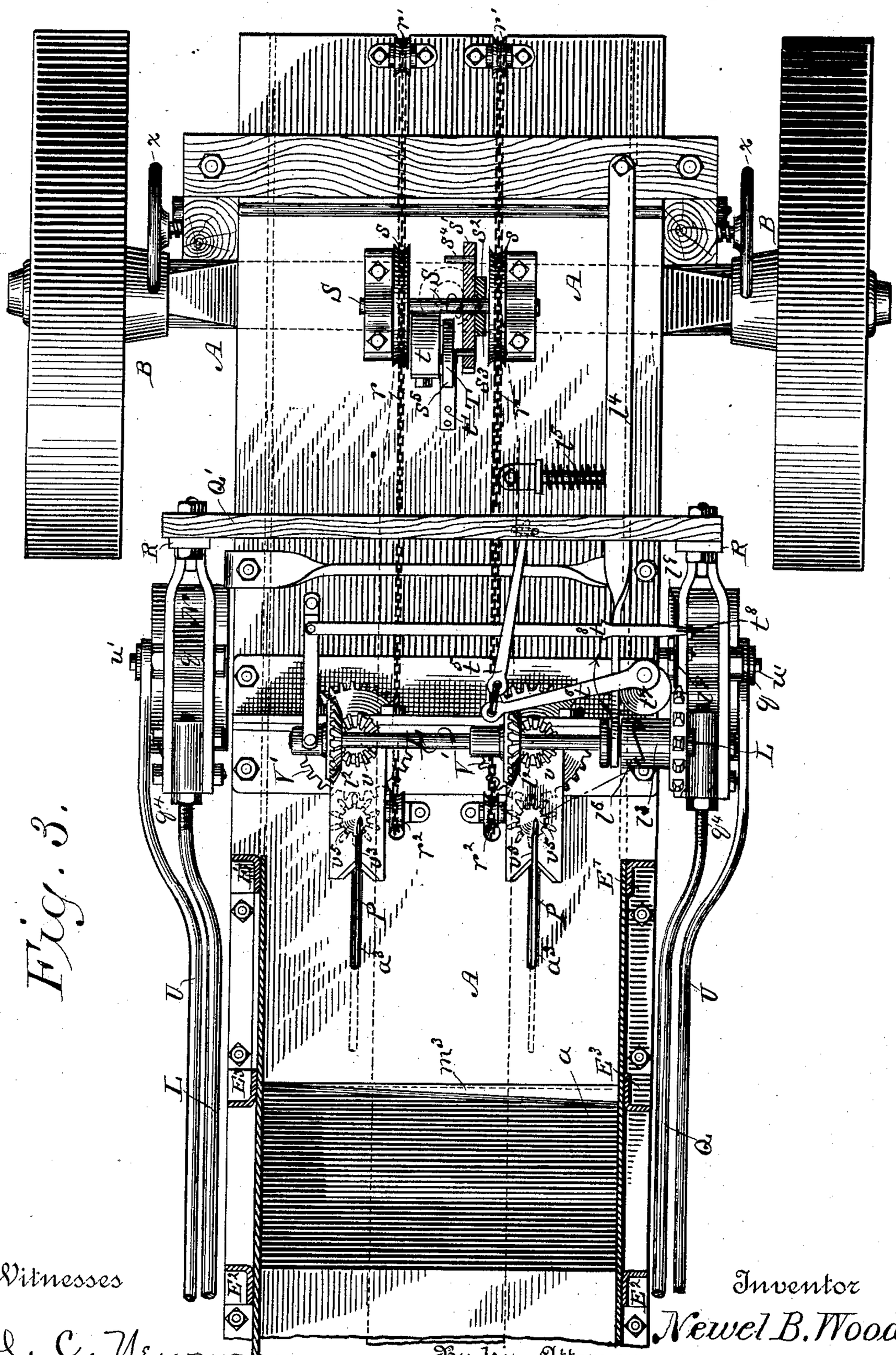

Fig. 3.

Witnesses

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SELF BINDING STRAW COMPRESSOR.

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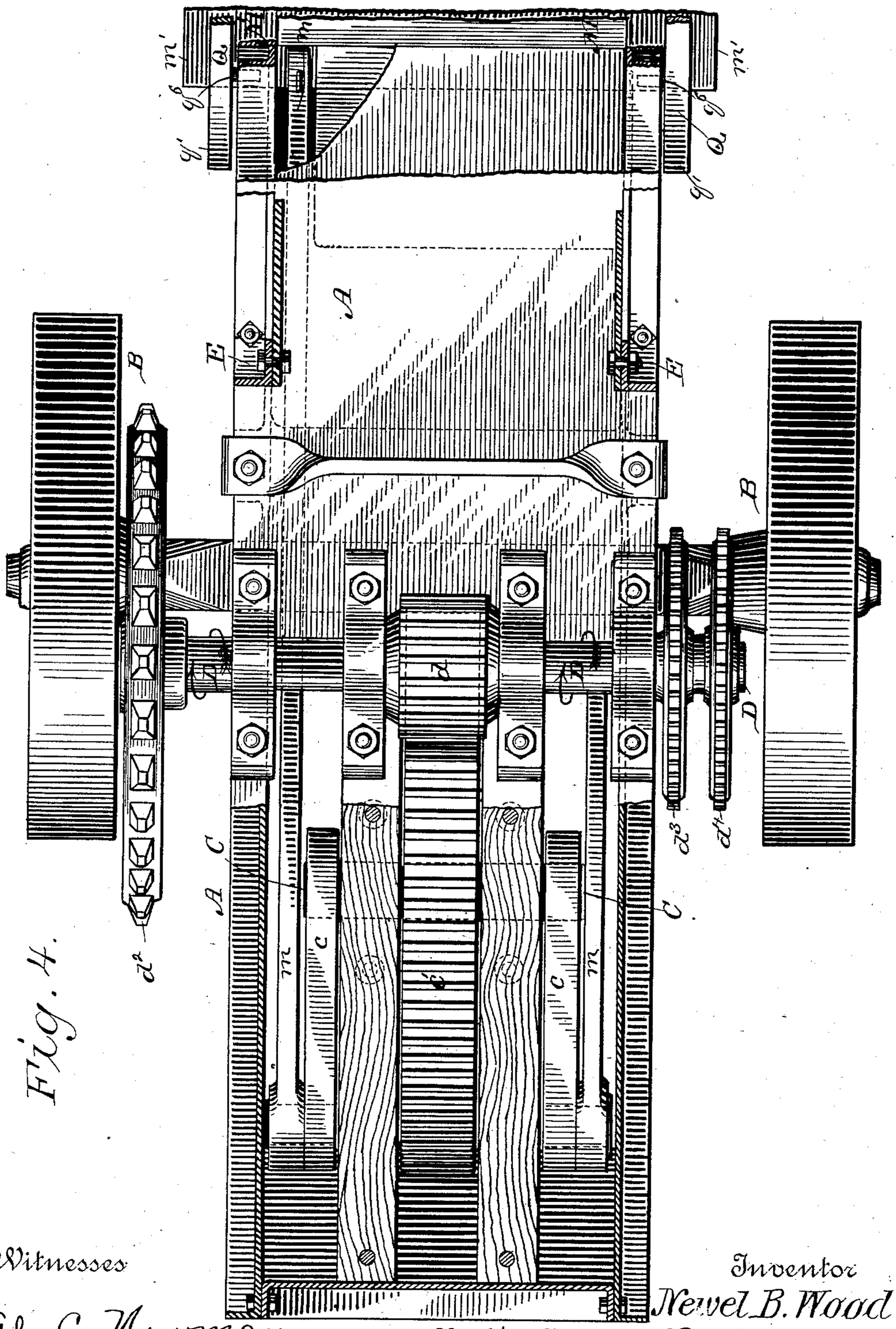

Fig. 4.

Witnesses

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(No Model.) 5 Sheets—Sheet 5.

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SELF BINDING STRAW COMPRESSOR.

No. 367,490. Patented Aug. 2, 1887.

Fig. 6.

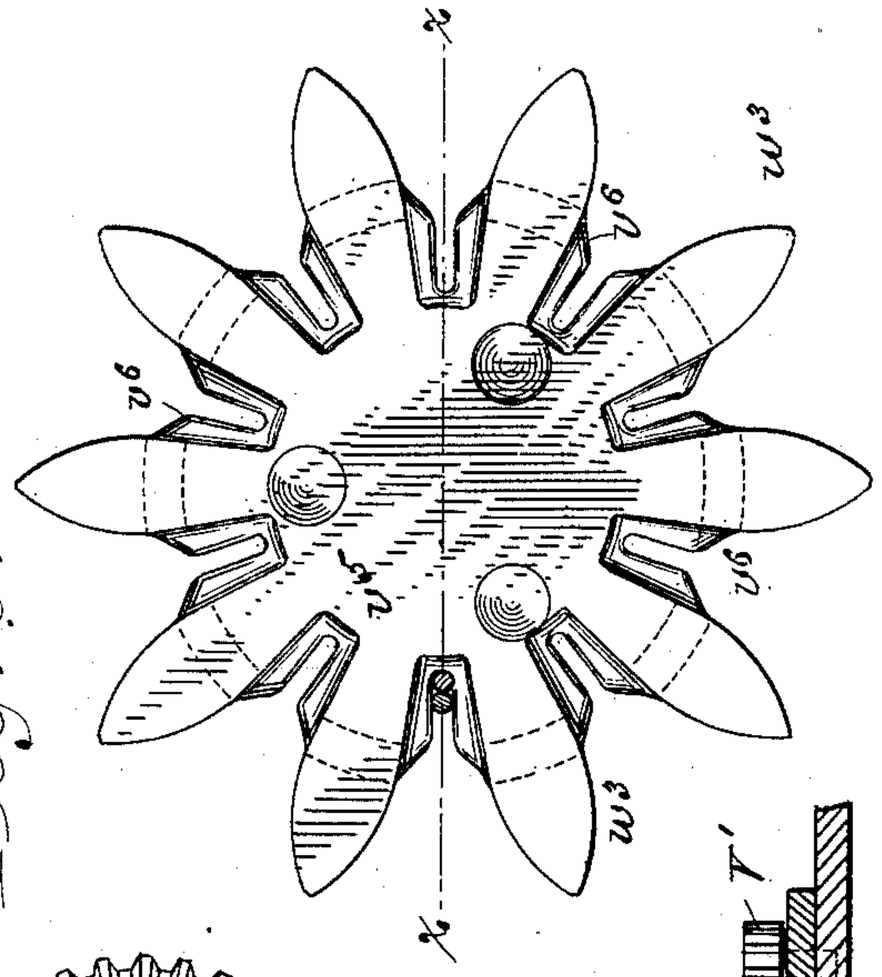


Fig. 4.

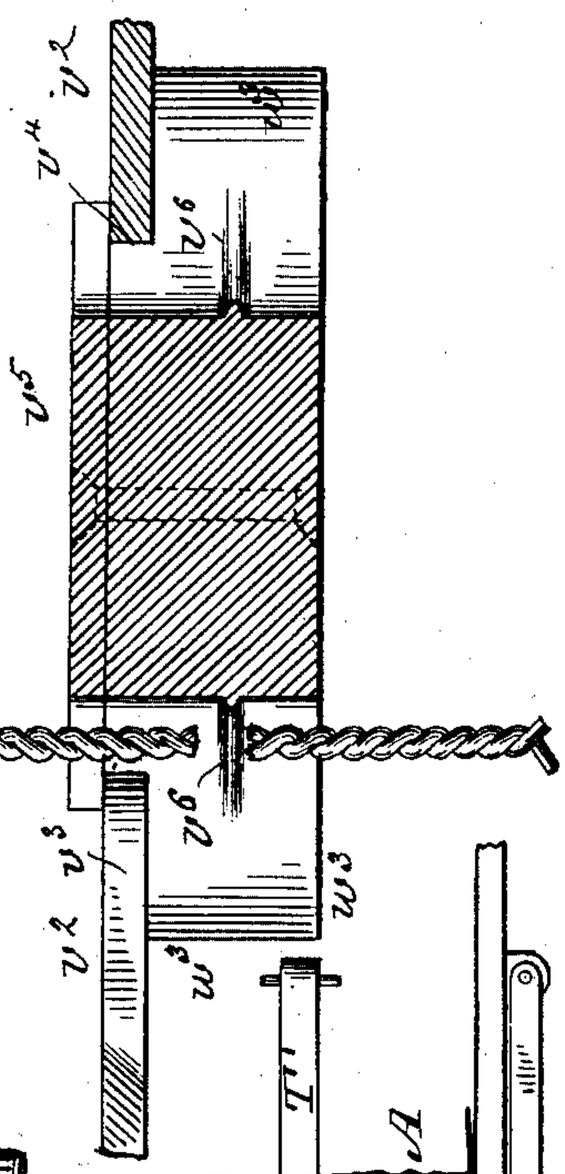
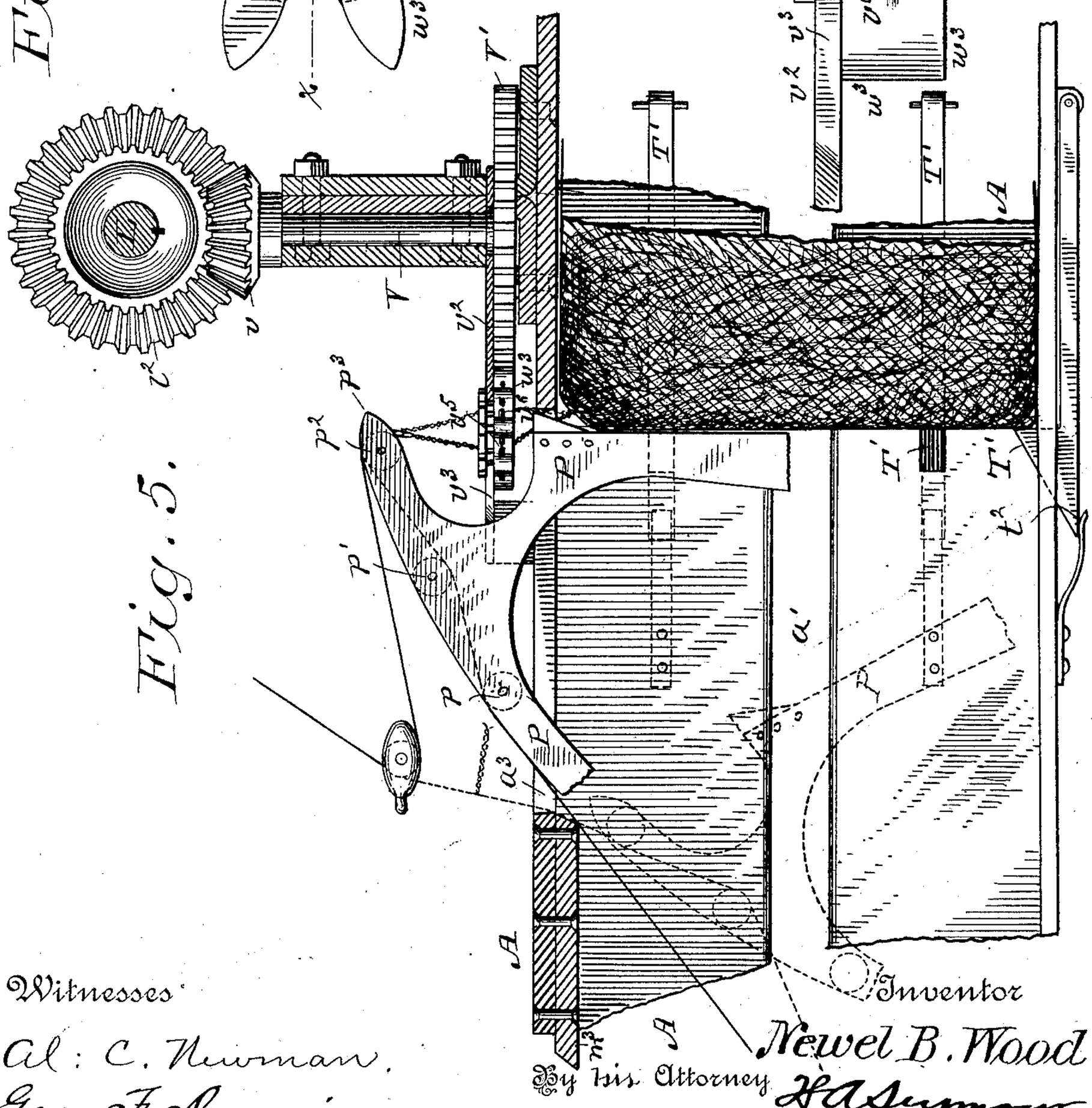


Fig. 5.



Witnesses

Al: C. Newman.

Geo. F. Downing.

Inventor

Newel B. Wood

By his Attorney H. A. Seymour

UNITED STATES PATENT OFFICE.

NEWEL B. WOOD, OF WASHINGTON COURT-HOUSE, OHIO, ASSIGNOR OF ONE-HALF TO LOUIS C. COFFMAN, OF SAME PLACE.

SELF-BINDING STRAW-COMPRESSOR.

SPECIFICATION forming part of Letters Patent No. 367,490, dated August 2, 1887.

Application filed November 16, 1886. Serial No. 219,047. (No model.)

To all whom it may concern:

Be it known that I, NEWEL B. WOOD, of Washington Court-House, in the county of Fayette and State of Ohio, have invented certain new and useful Improvements in Self-Binding Straw-Compressors; and I do hereby declare the following to be a full, clear, and exact description of the invention, such as will enable others skilled in the art to which it appertains to make and use the same.

My invention relates to an improvement in hay and straw compressing and baling machines, and more particularly to an improvement in the particular machine of this character for which application, Serial No. 199,151, for Letters Patent has already been made by me.

The objects of my invention are to construct a machine the various parts of which are arranged so as to feed, compress, bind, and discharge the material therein in a single passage through the machine.

With these ends in view my invention consists in the peculiar and novel construction and arrangement of devices for compressing the straw or other material into compact form preparatory to being bound, as hereinafter described and claimed.

My invention further consists in certain novel devices for tightly drawing the binding cords or wires about the compressed material, twisting the wires together, and severing them when twisted, so as to fasten the binding ends or wires about the finished bales, and at the same time connect the wires to receive the newly-formed bale, as hereinafter described and claimed.

My invention further consists in certain peculiar arrangements of mechanism whereby the size of the bale is regulated and a part of the machine is set in motion by the outward passage of the compressed material, as hereinafter described and claimed.

My invention further consists in certain novel and connected arrangements of mechanism whereby the various parts of the machine are set in motion, as hereinafter described and claimed.

My invention still further consists in certain peculiar and novel details of general construction and arrangement, as hereinafter described and claimed.

My invention still further consists in certain novel and peculiar features of construction and combinations of parts, as will be hereinafter described, and pointed out in the claims.

In the accompanying drawings, Figure 1 is a side elevation of my improved compressing-machine. Fig. 1ª is a detached view of the packer-carrying shaft. Fig. 2 is a vertical horizontal section of the forward portion of the machine with the binding-wires in position to be twisted. Fig. 3 is a top plan view of the forward end of machine with the parts in position of tying. Fig. 4 is a top plan view of the rear of the machine with a part of the covering removed. Fig. 5 is an enlarged sectional view of a portion of machine, showing the position of the parts while the wire is being twisted. Fig. 6 is a detached view of the twister or knotter. Fig. 7 is a vertical section through line *x x* of Fig. 6.

A represents the body of the machine, which is of oblong rectangular form and which may be mounted on trucks B or other suitable supporting gears, as desired. A crank-shaft, C, is horizontally mounted in the rear end of the body A and provided with two crank-arms, *c c*, to which further reference will be hereinafter made. Midway of its length this shaft C carries a gear-wheel, *c'*, the teeth of which mesh with those of a pinion, *d*, upon a power-shaft, D, which is mounted horizontally in standards *d'* upon the body A, as shown. These shafts C D extend transversely of the body A, and the shaft D lies above and beyond the shaft C, as will be seen by reference to the drawings. Upon one end of the shaft D is mounted a sprocket-wheel, d^2, which receives power from any suitable motor through a belt or chain running over its periphery. Upon the opposite end of this shaft D are mounted sprocket-pulleys d^3 d^4, for a purpose to be hereinafter described.

Suitable upwardly-extending standards, E E', are arranged on the top of the middle portion of the body A, adapted to form supports for various parts of the operating mechanism, and a second set, E^2 E^3, located somewhat nearer each other and between the standards E E',

serve both as supports for a portion of the operating mechanism and also form a downwardly-enlarged feed-throat, through which the straw or other material to be compressed passes on its way to the compression-chamber.

In the upper extremity of the standard E is mounted a horizontal shaft, F, which carries a band or chain wheel, f, over which the chain or belt f' from pulleys d^3 passes. Shaft F also carries a gear-wheel, f^2, located at the sides of band or chain wheel f, the teeth of which mesh with those of an idle gear-wheel, g, running upon a shaft, G. This shaft G also carries a band or chain wheel, g', from which a band or chain, g^2, runs to a pulley, h, upon a shaft, H, which is mounted horizontally in the upper extremities of the front standards, E'. It will thus be seen that the two wheels f^2 g revolve toward each other. Mounted on the shafts H G are rollers which actuate the endless belts I, these belts being of canvas or other suitable material and provided with transverse slats i, which by the motion of the belts tend to force the straw downward into the feed-opening a.

The passage of straw or other material to the opening a is still further aided by a series of horizontally-mounted needles or packers, g^3, which are mounted upon the crank-sections g^4 of crank-shaft G', so that as the shaft G' revolves the fingers or packers g^3 will alternately enter the straw and draw it downward toward the compression-chamber and evenly distribute it therein. The shaft G' is rotated by chain l, running over wheel G^2. Links g^5 are pivoted at one end to frame A, and the opposite ends of said links are pivoted to the lower ends of the packers g^3, whereby the said links serve to insure the proper action of the packers. Upon the standards E^2 is mounted a band or chain wheel, K, over which runs a belt or chain, k, from the belt or chain pulley d^4 upon the power-shaft D. A belt, l, runs from the periphery of belt or chain wheel K around wheel G^2 on shaft G', beneath wheel l^5 and over wheel l^6, and thence to a loose belt or chain wheel, l', which is mounted upon a horizontal shaft, L, extending partially across the body A. This shaft L carries a suitable number of bevel-gears, l^2, which serve to transmit power to the knotting mechanism, to be hereinafter described.

Within the body or box A is located the reciprocating traverser M, which is of such size as to fill the interior of said box or body. At its rear face this traverser is suitably coupled to two rods, m, by means of a cross-head and straps, which are in turn connected at their rear ends with the crank-sections c c of the shaft C, so that as said shaft revolves it will reciprocate the traverser M longitudinally of the body A, and the rods m serve not only to actuate the traverser, but also to guide its movement in the body A.

It will be readily seen that the motion of all the above-described parts is continuous, irrespective of the periodical movements of the tying, threading, and other mechanism, yet to be described, these latter parts being atomatically thrown in and out of action by the movement of the bales through the press. Rigidly attached to the rear of the traverser M is the cross-head M', projecting through and working in two slots, a', formed longitudinally in the vertical sides of body A. Upon the upper front edge of the traverser M is located a knife, m^2, which may have either a plain or serrated cutting-edge, and which works in conjunction with a similar knife, m^3, secured to the front transverse edge of the feed-opening a. The depth of the traverser M is such that it closes the feed-opening during its forward movement, in order to prevent the entrance of any more straw into the body until the traverser has traveled backward again, at which time the straw that has accumulated will drop into the bale-chamber. As the traverser moves forward, the knife m^2, by its shearing contact with knife m^3, cuts loose the straw from the supply above, which straw is carried forward by the traverser to be baled. The purpose of widening the lower extremity of the feeding-throat will also be perceived at this stage of the description, as it enables the feeding devices to accumulate a supply of straw while the traverser closes the feed-opening, so that when the traverser has been drawn backward the accumulated supply of straw will fall into the body A, and thus no cessation of the feed will occur.

At each side of the body A is mounted a gear segment or quadrant, N, which is pivoted at n to the body. Teeth n' of these quadrants are at the lower extremities of the same, and each set of teeth mesh with those of a gear-pinion, o, mounted rigidly upon a shaft, O, extending transversely beneath the body A. This shaft carries two pinions, o, one at each end, and there are two segments, N, one at each side of the body A. Upon the shaft O are rigidly mounted a series of threading-frames, P, corresponding in number with the wires or cords for binding the bales. Each of these threading-frames is of segmental form and works upward through a longitudinal slot, a^2, in the bottom of the body, and a similar slot, a^3, in the top of the said body. Owing to the reduced size of this machine, I generally prefer two of these threading-frames, and the upper and lower slots, a^2 a^3, correspond in number with said frames. The cords or wires for supplying these frames are supplied from two reels or spools, o' o^2, placed, respectively, below and above the body A, as shown. The wires or cords from spools o' pass over and under guiding-sheaves p p' p^2 upon the frames P to the tips p^3 of said frames, and these wires pass through the slots a^2 from the tips p^3 and their ends are fastened to the ends of the wires or cords from the upper spools, o^2. The number of spools or reels and tension devices correspond with the number of threading-frames, and said spools are mounted, respectively, upon an upper spool-shaft, o^5, and a lower spool-shaft, o^6. From the foregoing descrip-

tion it will be seen that the thread-carriers are actuated by oscillations of their shaft O, which is actuated in turn by oscillations of the pivoted segments N.

It will be seen that the threading-frames P serve to take up the rebound of the bales through the middle portion and hold the latter while being bound, while the spring-actuated hooks T′ prevent the rebound of the straw at the edges of the bales. These hooks are so formed with beveled ends t^2 that the traverser forces them back out of the way as the hay passes, the hooks immediately springing into their normal position by passing into slots s^3 of the traverser. The oscillations of these segments N are produced by two extensible bars, Q, each of which is pivoted at q to the corresponding segments above its small end. At points q^4, near the forward end, the bars Q are screw-threaded to admit of their being readily lengthened or shortened should the parts become worn sufficiently to produce their non-action. At their rear ends these bars are each formed with a downwardly-extending hook, q', which, as the bars Q lie outside of the body A, engage at times with the cross-head or its extensions M′ of compressor M. This engagement of the hook of the hooked bars Q occurs during the backward stroke of the cross-head, and hence it will be seen that the upper parts of segments N will be carried backward and produce a forward movement of the lower parts of the segments. As the results of this movement, the threading-frame P will be raised into the body A, and as the cross-head M′ moves forward it will reverse the stroke of segment N by the cross-head coming in contact with pivoted arms u, which are connected therewith by rod U, and thereby eject the threading-frames P, and the mass of straw will impinge against the joined upper and lower wires, which the threading-frames leave in position for the new supply of straw, which draws them outward toward the forward or discharge end of the body A. Thus the wires are caused to embrace the mass of straw and assist in its compression into the form of a bale. The bars Q extend forward beyond their point of pivotal attachment to the segment N, and at their forward ends said bars are provided with vertical bars R, these being connected at the top by a cross-bar, Q′, as shown. A horizontal shaft, S, extends partially across the body A, and the wheels s, preferably two in number, are mounted thereon. These wheels s are grooved on the periphery to receive and carry the endless chains r, said chains r extending longitudinally of the body A and side by side over pulleys r' r^2, which are located, respectively, at the forward end of the machine and opposite the twisters v^5. These chains r pass through the top of the baling-chamber in contact with the bales, so that as the latter are forced forward toward the discharge end of the machine the straw or other material forming the bale impinges against the chains r and moves them forward in the compression-chamber, thereby rotating the shaft S in the direction indicated by arrows. The chains r also serve a second purpose—that of preventing a rebound of the straw, which might occur as the straw passes forward, by rubbing against the stationary surface of the baling-chamber; but as the chains move forward approximately at the same rate as the bales, comparatively little resistance to the straw is caused. This shaft S also carries a loosely-mounted ratchet-disk, s', midway between wheels s, the teeth upon the periphery of which incline toward the forward end of the machine. A pawl, s^2, pivoted upon this disk, engages the teeth of a smaller disk, s^3, rigidly secured to the shaft S, the said teeth being inclined oppositely to the teeth of disk s'. The disk s' also carries one or more tripping-pins, s^4, which engage the lower end of the pawl-rod T, which is pivoted upon an upright arm, t, resting upon the top of the body A. The size of the bale is regulated by the position of these tripping-pins, the number of bales per rotation of the disk s' corresponding with the number of equally-separated tripping-pins located thereon. The rod T is pressed forward at its lower end by a spring, t', so that its lower end engages with the pins s^4 of the disk s' and its upper end, which has a hook, s^5, which engages the horizontal bar Q′. It will thus be seen that as the shaft S is rotated by the moving mass of straw the pawl-rod T is disengaged from the horizontal bar Q′, allowing the hooked ends of the rods Q to drop into position to be drawn back by the receding traverser simultaneously with the rotating of the segments N and threading-frame P, as before described. In so doing, the hook q', which is provided with the inwardly projecting-pin q^6, slides beneath the pivoted incline q^3, which latter, acting as a gravity-latch, immediately drops on being released by pin q^6. It will then form an inclined surface upon which pins q^6 will ascend as the traverser M moves forward, releasing the hooks q' from the cross-head M′, allowing the horizontal bar Q′ again to be engaged by the hooked end of the rod T, by which it is held until sufficient hay or straw has been delivered to form another bale, when the bar Q′ is automatically released and the operation repeated. The disengagement of bar Q′ is owing to the action of the tripping-pins upon disk s' relative to the pawl-rod T, throwing the lower end of the same rearward. As the bar Q′ rises and moves backward, its hook q^2, engaging the teeth of the wheel s', accelerates the motion of the disk or wheel s', thereby clearing the path of lower end of rod T, so as to permit this rod T to resume its normal position and allow the upper end of the pawl-rod to move into position to receive the bar Q′ by its hooked end. When the hooked ends of bars Q have ridden up over the inclined guides upon their return movement, which they do as the traverser moves forward, the bar Q′ is in engagement with the hooked end of the pawl-rod T, and the disen-

gagement of the bar Q′ and pawl-rod T may be repeated. During the forward movement of the traverser its cross-head extensions M′ come in contact with arms *u*, extending upward from and pivoted at the lower end to arms U, which are in turn pivoted at their forward ends to the segments N at *u′*, and returns the said segments to their normal position, throwing the threaded frames P down out of the path of the traverser, as shown in Fig. 1.

The shaft L, before described, is provided at one of its ends with clutches l^3 l^6, the disengagement or engagement of which throws the wire-twisting mechanism respectively out of and in motion. The free end of lever l^4, which oscillates the movable clutch l^6, is normally held outwardly, as shown in Fig. 3, by the spiral springs l^5; but as the cross-bar Q′ moves forward to be disengaged by the hooked end of the pivoted pawl-rod T the link t^5, which is loosely buckled to the arm t^6, gives the cam t^7 a turn, which forces the free end of the lever l^4, carrying clutch l^6, inward, where it is held by the latch t^8, which immediately engages it. The clutches l^3 l^6 are held thus disengaged until the backward movement of cross-bar Q′ takes place, when the latch t^8 is liberated from its engagement with the lever l^4 by the cam surface l^9, secured to one of the arms Q, as shown in Fig. 1, sliding beneath its free end, lifting it and allowing the spring l^5 to force the clutches together.

The beveled gears l^2 mesh with similar gears, *v*, upon vertical shafts V. Loosely mounted upon the lower ends of shafts V are the rearwardly-projecting plates v^2, which are provided with the slots v^3. (Clearly shown.) The said slots serve a double purpose—the outer portion acting as a guide for the binding-wires, while the inner rounded portion, v^4, carries the twister v^5. The twister v^5 is provided with teeth w^3 on the periphery, which mesh with similar teeth on the large wheel V′, mounted on the lower end of its vertical driving-shaft V. Between each pair of teeth w^3, and formed integral with the inner faces of said teeth, the U-shaped ribs v^6—a pair between each two teeth—are located opposite each other and sufficiently separated to admit of the passage of the binding-wires successively therein and not allowing them to slide by each other. Thus, while the twister v^5 is being driven by the large wheel V′ on the front, the wires are carried by the threading-frames P between the ribs v^6 at the rear. The twister then, continuing its revolution, twists the wires tightly together until they sever by rotation between the ribs v^6, thus finishing the tie on the bales just formed, while the ends of the wires remain together for the next bale, as previously described.

The sides of the body afford additional lateral pressure through the mass of straw and assist the cross-head in compressing the same. Said sections may be set farther inwardly at the beginning of the operation of the machine, and may be drawn outward when the machine has been operated for a short time, so as to decrease the lateral pressure. Each bale is discharged from the machine by one or more bales succeeding it through the compression-chamber.

The straw is first thrown into the hopper and is carried by the belts I down into the restricted throat of said hopper, at which point it comes within reach of the packers g^6, which latter force it into the compression-chamber. The movement of the completed bales regulate or control the movements of the threading-frames, and when sufficient straw to form a bale has been packed within the compression-chamber the movement of the outgoing bales trips the mechanism before described and permits the free end of bars Q to drop into a position to engage the cross-head M. This engagement of the bars Q with the cross-head M elevates the threading-frames P, which latter carry the wire up into a position to be engaged by the twister, which is now operating. This twister twists and severs the wire, and at the same time unites the ends of the wires leading from the upper and lower reels, as shown in Fig. 1. On the return movement of the cross-head, the latter engages the lever *u*, which, through the intervention of the rods U and segments N, withdraws the threading-frames from the compression-chamber. The rearward movement of the cross-head or compressor opens the lower end of the throat of the hopper or permits the straw therein to be forced into the compression-chamber, when it is acted upon by the compressor until sufficient quantity has been packed therein to form another bale, when the bars Q are again tripped and the binding operation repeated.

I do not wish to be understood as confining myself exclusively to the precise detail of construction described herein, as various modifications in such details may be employed without departing from the spirit and scope of my invention; hence I do not wish to limit myself to the particular construction herein set forth; but,

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

1. In a straw-baling machine, the combination of a body mounted on suitable trucks, a compression-chamber located therein, a feed for furnishing a continuous supply of material to the compression-chamber, a reciprocating compressor-head located in the compression-chamber, binders in readiness to receive the compressed material and surround the same prior to its being tightly fastened about the bale by suitable mechanism, means for severing the wire from the completed bale, connecting its ends, and laying the wires so connected in position for the next bale, and the operating mechanism, substantially as set forth.

2. In a straw-baling machine, the combination, with the body and a suitable compressor adapted to reciprocate therein, of a wire-twisting device consisting, essentially, of a guide-

plate having a wheel loosely mounted therein, this wheel having peripheral teeth adapted to receive the wire to be twisted and to mesh with the teeth of a suitable actuating-gear, substantially as set forth.

3. In a straw-baling machine, the combination, with the body and compression-chamber formed therein and a compressor adapted to reciprocate within said compression-chamber, of a horizontally-mounted crank-shaft located above the body and a series of packers loosely mounted on said shaft, these packers being adapted to enter the feed-throat and move downward therein for forcing the straw or other material into the compression chamber, substantially as set forth.

4. In a straw-baling machine, the combination, with a compression-chamber and downwardly-enlarged feed-throat and a compressor adapted to reciprocate within said compression-chamber immediately below the feed-throat, of a set of oscillating packers loosely mounted on a horizontal shaft, the free ends of these packers being adapted to successively enter the feed-throat, furnishing a regular and continuous supply of straw or other material to be baled to the compression-chamber, substantially as set forth.

5. In a straw-baling machine, the combination, with a compression-chamber and a downwardly-enlarged feed-throat and a compressor adapted to reciprocate within said compression-chamber, of a set of straw-packers loosely mounted on an actuated crank-shaft, one end of the said packers being pivotally secured to the machine, while the free ends are adapted to effect a continuous downward pressure upon the straw within the feed-throat, substantially as set forth.

6. In a straw-baling machine, the combination, with a reciprocating compressor-head and an oscillating device for moving the threading mechanism in one direction, of an extensible rod adapted to engage the compressor-head as the latter moves backward and move the threading mechanism in the opposite direction, substantially as set forth.

7. In a straw-baling machine, the combination, with a reciprocating compressor-head and an oscillating device adapted to connect the latter with the threading and twisting mechanisms, of the extensible rods connected to the binding mechanisms, the said rods being screw-threaded at one portion and provided with a downwardly-projecting hook at the free end adapted to be engaged by the backward movement of the compressor-head, thereby throwing the threading and twisting devices in operation, substantially as set forth.

8. In a straw-baling machine, the combination, with the body, compression-chamber, the compressor-head adapted to reciprocate therein, and the oscillating arms, of the extensible rods connected with the twisting and threading mechanism, these rods having the downwardly-projecting hooks at the free ends, which are engaged and carried back by the retreating compressor-head and moved forward by the engagement of the oscillating arms by the forward movement of the compressor-head, substantially as set forth.

9. In a straw-baling machine, the combination, with a threading-frame, twister, and compressor, of an oscillating connection for removing the threading-frame from the twister when impinged by the forward movement of the compressor-head, and an extensible hook-connection the engagement of which by the compressor-head returns the threading-frames to the twister, substantially as set forth.

10. In a straw-baling machine, the combination, with a reciprocating compressor and a threading-frame, of the extensible rod connected indirectly with the threading-frame and provided with a downwardly-extending hook at its free end, substantially as set forth.

11. The combination, with the reciprocating cross-head, a threading-frame, and twisting mechanism, of an adjustable or extensible rod indirectly connected to the threading mechanism and adapted to be engaged by the cross-head while the latter is moving in one direction for moving the latter up to the twisting mechanism, and an oscillating arm and connections adapted to be engaged by the cross-head while the latter is moving in the opposite direction for returning the threading-frame to its normal or depressed position.

12. In a straw-baling machine, the combination, with a twister-driving wheel, and a set of threading-frames actuated by suitable mechanism, said threading-frames carrying the binding cords or wires, of a set of peripheral toothed twisting and severing devices the teeth of which have ribs on the interior adapted to receive the wires to be twisted, the said twisting and severing devices adapted to be rotated by their engagement with the peripheral teeth of the driving-wheel, substantially as set forth.

13. In a straw-baling machine, the combination, with a reciprocating compressor-head and a set of threading-frames provided with suitable gears, the upper and downward movements of which frames are caused respectively by the backward and forward motions of the compressor-head, of the wire-twisting device the peripheral teeth of which have the oppositely-located ribs on their inner faces, between which the wires to be twisted pass, and the driving-gear adapted to mesh with the twister-teeth, substantially as set forth.

14. In a straw-baling machine, a set of wire twisting and severing devices, consisting, essentially, of a revoluble wheel loosely mounted in a guide-plate, said wheel being provided with peripheral teeth the spaces between which are restricted to the size of the binding-wires to be twisted, substantially as set forth.

15. In a straw-baling machine, a set of twisting devices consisting, essentially, of a guide-plate in which is mounted a revoluble peripherally-toothed wheel, the adjacent faces of which are oppositely ribbed, the said guide-

plate being adapted to guide the wire between the ribs of the teeth, where the wires are tightly twisted and severed by the rotation of the wheel, substantially as set forth.

16. In a straw-baling machine, the combination, with a compression-chamber, a reciprocating compressor, and a threading-frame, of a wire twisting and severing wheel having peripheral teeth, the latter having ribs formed longitudinally on their adjacent faces, substantially as set forth.

17. In a straw-baling machine, the combination, with the body and a shaft mounted horizontally thereon, carrying a set of wheels, of a set of chains or bands extending over these wheels and into the body of the machine, substantially as and for the purpose set forth.

18. The combination, with the twisting and threading mechanism, of an endless chain moved by the outcoming bales and adapted to start the twisting mechanism, substantially as set forth.

19. In a straw-baling machine, the combination, with the compression-chamber and a horizontally-mounted shaft above this chamber carrying a set of chain-wheels, of a set of chains extending over these wheels and suitable pulleys into the top of the compression-chamber, whereby motion is imparted to the shaft by the outward passage of the bales, substantially as set forth.

20. In a straw-baling machine, the combination, with the endless chains and a shaft carrying the wheels upon which these chains rotate, of a pivoted spring-actuated pawl located above the shaft and a wheel driven by the shaft and provided with tripping-pins for engaging the pawl, substantially as set forth.

21. In a straw-baling machine, the combination, with a ratchet-toothed wheel mounted on a chain-driven shaft, said wheel being provided with a series of tripping-pins, and a pivoted pawl adapted to be engaged by the tripping-pins by the rotation of the shaft, of the binding, threading, and knotting mechanism, adapted to be engaged or disengaged by the pivoted pawl, and a hook at the forward end of the binding mechanism, the engagement of which with the teeth of the ratchet-wheel accelerates the rotation of the chain-actuated shaft, substantially as set forth.

22. In a straw-baling machine, the combination, with the reciprocating compressor-head, the extensible hooked rods for engaging the compressor-head, and the oscillating pivoted gear-segment connections, of the horizontally-mounted twister-operating shaft carrying a pair of separable clutches, a spring-actuated lever for regulating the engagement of said clutches, and gear-wheels for operating the rotations of the twisting and severing devices, substantially as set forth.

23. In a straw-baling machine, the combination, with a compressor-head, the extensible hooked rod for engaging the said compressor-head in its backward movement, the oscillating pivoted gear-segment connections, and the twister-actuating shaft carrying separable clutches, of a spring-actuated lever which normally holds the said clutches together and a cam-connection for separating the clutches upon the backward movement of the extensible rod, substantially as set forth.

In testimony whereof I have signed this specification in the presence of two subscribing witnesses.

NEWEL B. WOOD.

Witnesses:

HERMAN RICE,

W. H. DIAL.