

No. 701,575.

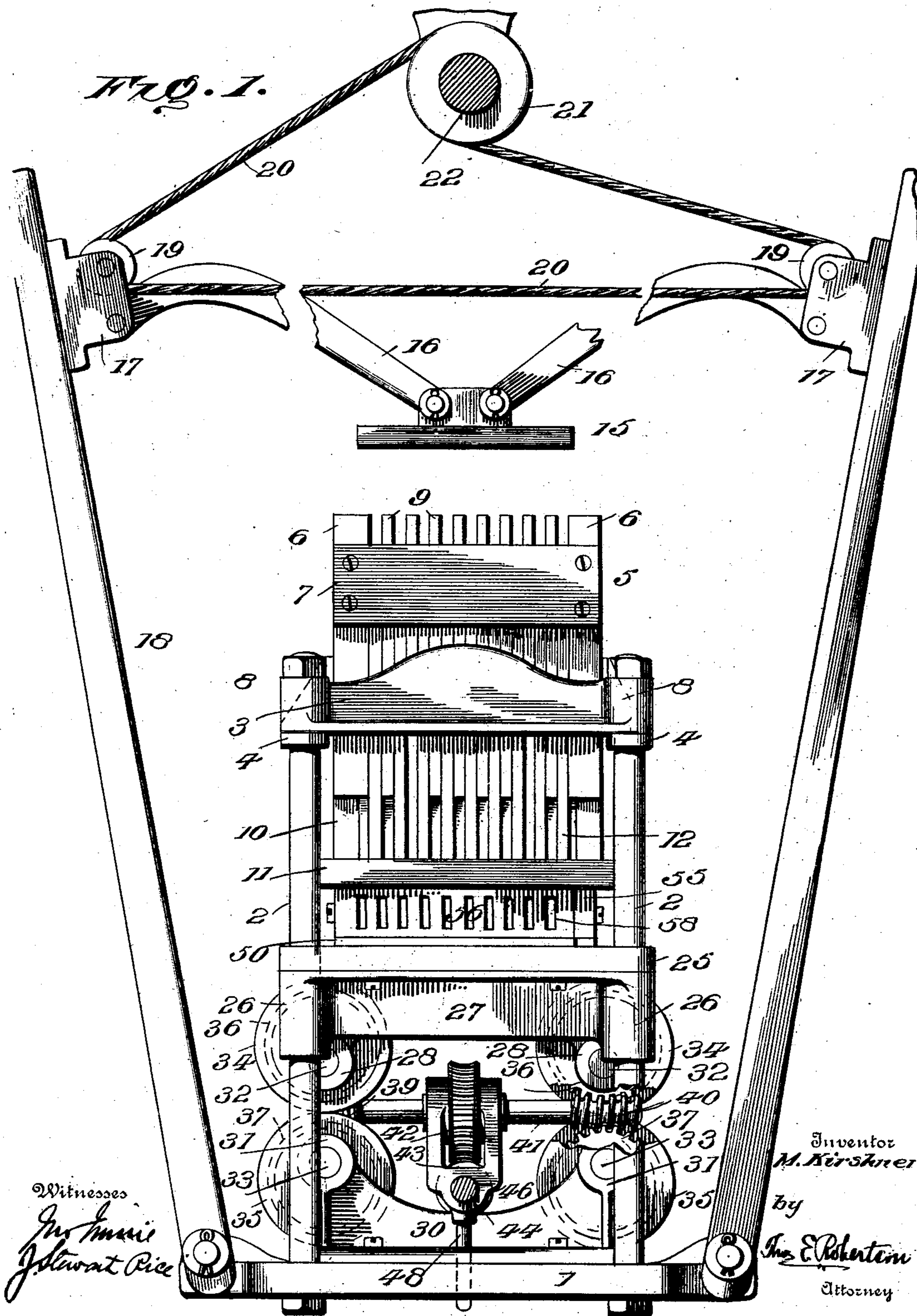
Patented June 3, 1902.

M. KIRSHNER.
BALING PRESS.

(Application filed Aug. 24, 1901.)

(No Model.)

3 Sheets—Sheet 1.



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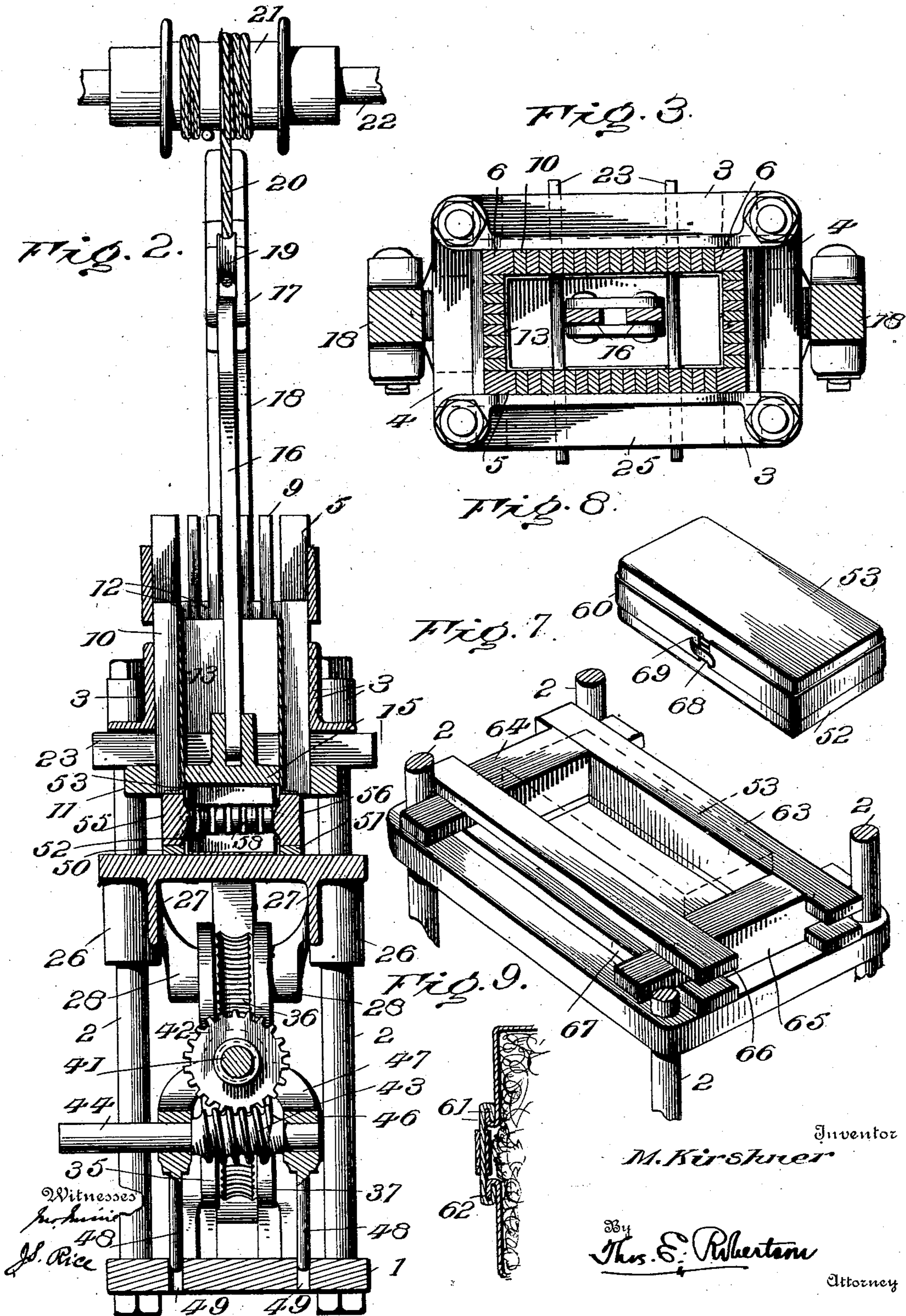
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3 Sheets—Sheet 2.



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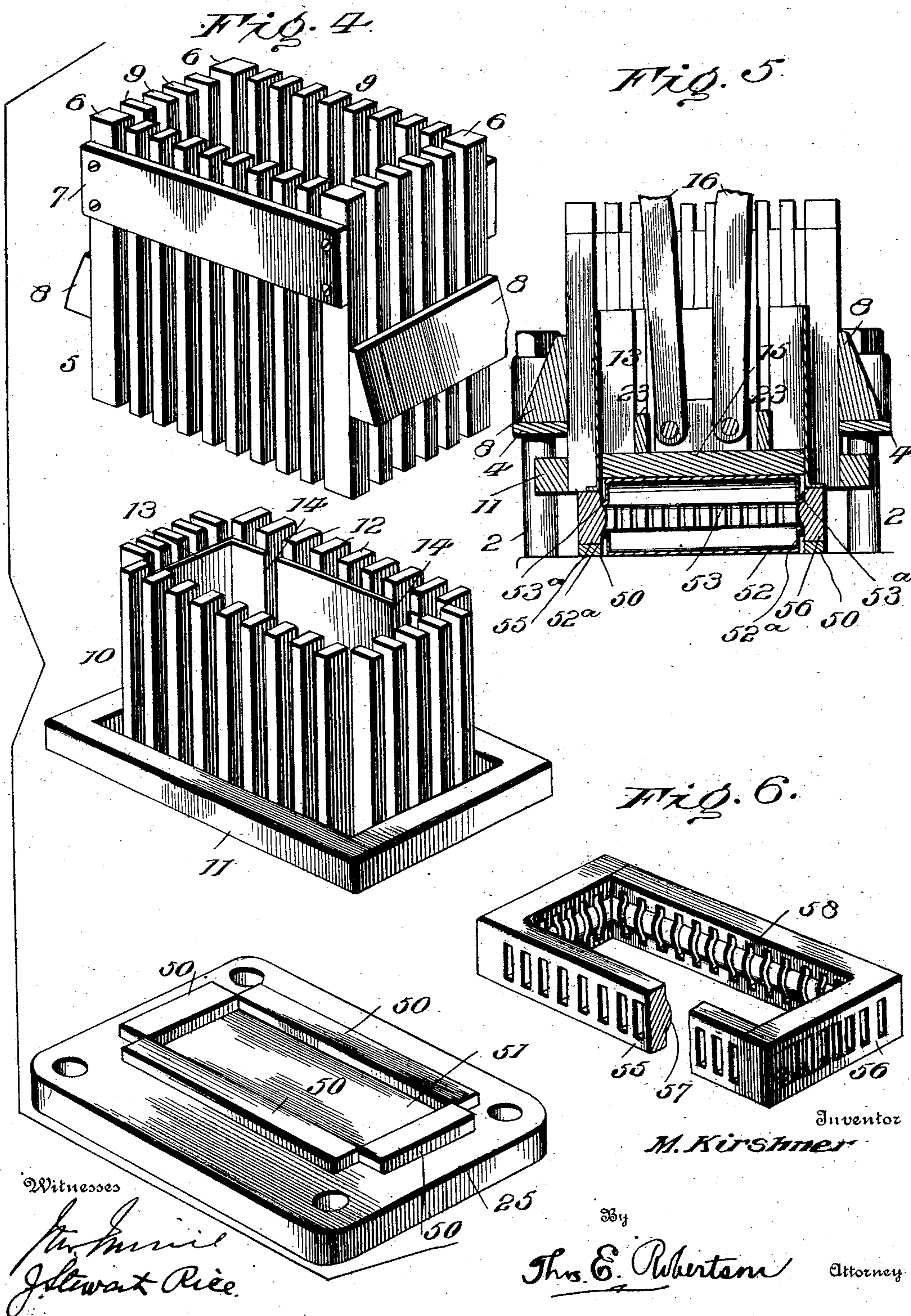
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3 Sheets—Sheet 3.

(No Model.)



UNITED STATES PATENT OFFICE.

MICHAEL KIRSHNER, OF LYNCHBURG, VIRGINIA.

BALING-PRESS.

SPECIFICATION forming part of Letters Patent No. 701,575, dated June 3, 1902.

Application filed August 24, 1901. Serial No. 73,183. (No model.)

To all whom it may concern:

Be it known that I, MICHAEL KIRSHNER, a citizen of the United States of America, and a resident of Lynchburg, in the county of Campbell and State of Virginia, have invented certain new and useful Improvements in Baling-Presses, of which the following is a specification.

This invention relates to improvements in the art of compressing and baling cotton and other material, and has for one of its objects a machine or press which can give the complete compression to the material in a single machine instead of in two machines, as is generally the present practice. It is now quite the usual practice to give preliminary pressure to the cotton at the plantation, and then the partly-pressed bale has to be removed to a more powerful press, sometimes at a great distance, where the final compression is given.

It is my aim to provide a press that is so simple and withal so efficient and powerful that it can be made sufficiently cheap to be within the reach of all plantations, so that the complete compression can be given to the material in a single press before the bale is shipped.

Another object is to provide a machine that will be suitable for baling the material in a practical and commercial fire and water proof covering.

With these and other objects in view, which will be hereinafter set forth, my invention consists in a press of the peculiar construction, arrangement, and combination of parts, as hereinafter described in its preferable embodiment and then definitely set forth by the claims at the end hereof.

In the drawings which accompany and illustrate one way of carrying out my invention, Figure 1 is a side elevation of a press made in accordance with my invention, but with parts broken away to better show the operating mechanism. Fig. 2 is a vertical central section of the same. Fig. 3 is a horizontal section through the "cribs." Fig. 4 is a group of perspective views, showing the two cribs and the movable bed-plate. Fig. 5 is a sectional detail through the bale. Fig. 6 is a perspective view of a knockdown frame. Fig. 7 is a perspective detail of the movable bed-

plate, showing removable bars thereon used to aid in securing the fastening-strip to the bale. Fig. 8 is a perspective view of the bale, and Fig. 9 is a sectional detail showing the method of locking the "pans" or sections of the bale-covering together.

Referring now to the details of the drawings by numerals, 1 designates the main or fixed bed-plate, from which rise the standards or posts 2, on the upper ends of which are securely bolted the upper cross-heads 3 and 4, within which is secured the upper or stationary crib 5. This stationary crib is formed of a frame consisting of four corner-posts 6, which are connected together by cross-pieces 7 on the sides and wedge-shaped cross-pieces 8 on the ends, which latter rest on the cross-heads 4, as shown in dotted lines in Fig. 1 and in full lines in Fig. 5. The said crib 5 also consists of a series of vertical slats 9 between the corner-posts, as clearly seen in Fig. 4.

Coacting with the aforesaid stationary crib 5 is a sliding crib 10, consisting of a rectangular frame 11 and a series of upright or vertical slats 12, which are so spaced that they fit between the slats 9 of the stationary crib 5 and slide or telescope therein, as clearly shown in Fig. 1. This sliding crib is lined with sheet metal or any other suitable material 13, and this lining 13 is provided with two slots or openings 14 for a purpose to be hereinafter described.

15 designates a plunger or follower which is adapted to enter the cribs 5 and 10 and give the preliminary pressure to the material to be baled, and this plunger 15 is pivotally connected to a pair of curved connecting-rods 16 16, which in turn are pivotally connected to a pair of blocks 17 17, fixed to a pair of swinging arms 18 18, pivoted to the main or fixed bed-plate 1. Pulleys 19 19 are journaled within the blocks 17 17, and a rope 20 passes from these pulleys to a drum 21, mounted on and revolving with the shaft 22, driven from any suitable source of power. It will be obvious from the foregoing and the accompanying drawings that when power is applied to the shaft 22 to wind the rope 20 on the drum 21 the ends of the swinging arms 18 18 are brought toward each other, which causes the plunger or follower 15 to rapidly enter

the cribs 5 and 10, giving a rapid preliminary pressure to the cotton or other material which has previously been placed within the cribs. After this preliminary pressure has been exerted on the cotton or other material the plunger or follower 15 and its connected parts are in the positions shown in Fig. 2, and two heavy metal bars 23 23 are then passed under the cross-heads through the openings in the cribs and the openings or slots 14 in the crib-lining 13, when the plunger or follower 15 becomes fixed and now serves as a fixed platen, against which the material is given its final compression, as hereinafter described.

Mounted on the posts or standards 2 is a sliding compressing-follower, that I shall hereinafter term the "movable bed-plate" 25, which is capable of a vertical sliding movement on the said posts or standards and which has formed on or connected therewith extended bosses 26, which provide long bearings on said posts and give great steadiness and rigidity to their movable bed-plate. This bed-plate is also provided with a pair of depending ribs or cross-bars 27, from which project two pairs of hubs 28, forming a bearing for part of the mechanism for giving the final compression to the cotton or other material being operated upon. Bolted or otherwise secured to the fixed bed-plate 1 is a somewhat similar arrangement consisting of a central web 30 and two pairs of hubs 31. Each pair of these hubs 28 and 31 (there being four pairs in all) support journals or axle-pins 32 32 and 33 33, the journals 32 32 being situated directly over those numbered 33 33, and on these journals are rotatably secured the eccentric rollers or cams 34 34 and 35 35. These eccentric rollers or cams are also arranged in vertically-disposed pairs, the rollers or cams 34 being in rolling contact with the rollers or cams 35. As these eccentric rollers or cams revolve or roll on each other they necessarily cause their journals or axle-pins to separate or move one away from the other, and as the lower set is fixed it follows that the whole movement is imparted to the upper set of journals, and as the latter support the movable bed-plate 25 the said bed-plate is thereby given vertical movement. To impart rotary movement to these eccentrically-set rollers or cams, I form recessed gears 36 36 and 37 37 in said rollers, and between each pair of these gears (which in reality are worm-wheels) mesh worms 39 and 40, which are formed on opposite ends of a shaft 41, on which is fixed a worm-wheel 42, gearing with a worm 43, driven from a shaft 44 by any suitable power. (Not shown.) As the eccentric rollers 34 35 roll on each other and their journals approach or move away from each other, it is necessary to provide some means of supporting the shafts 41 and 44, the worm-wheel 42, and the worm 43, so that these parts may move vertically in order to accommodate themselves to the vertical movement of the eccentric rollers. To per-

mit this movement, I employ the bearing 46 for the shaft 44, which bearing is forked or bifurcated at 47 to support the shaft 41, the said bearing 46 having guides or standards 48, which pass through openings 49 in the fixed bed-plate 1, and thereby retain the bearing 46 in its proper position.

On the movable bed-plate 25 are formed or secured bars 50, providing a recess 51, specially adapted to receive or hold a pan 52, which forms the bottom or lower part of my improved bale-covering claimed in a separate application filed August 24, 1901, Serial No. 73,184. A similar pan 53 forms a top or upper part of my bale-covering, and I provide a knockdown frame formed of two parts 55 and 56, which is arranged to coact with said pans when the bale is being compressed. This frame is shown in perspective detail in Fig. 6 and is of the proper size to rest on the bars 50, hereinbefore mentioned. This knockdown frame is formed with an inwardly-swelled or convex portion 57, the use and purpose of which will be hereinafter described, and with openings or slots 58 to permit the air to escape as the material is compressed.

The above is a description of the preferable embodiment of my press, and its operation is as follows: Assuming that the movable bed-plate 25 and its operating mechanism are in the positions shown in Fig. 1, the movable crib 10 is pushed upward, the lower or bottom pan or section of the bale-covering 52 is placed within the recess 51, and the frame 55 56 is placed over said pan and on the bars 50, and the aforesaid movable crib 10 is then moved downward until it rests on the frame 55 56, as clearly shown in Fig. 1. The cotton or other material to be formed into the bale is then fed into the upper crib, and when a sufficient quantity is placed therein it is given a preliminary pressure by applying high or rapid power to the shaft 22 and drum 21, thereby winding the rope 20 on said drum, drawing the swinging arms 18 18 toward each other, and forcing the plunger or follower 15 within the crib 5 and giving the initial or preliminary pressure to the bale. Owing to the fact that the cotton or other material has not had any pressure before this action, a rapid movement can be given to the follower or plunger 15, and when the latter reaches the point shown in Figs. 2, 3, and 5 the heavy cross-bars 23 are inserted under the cross-heads through the slots in the cribs. These cross-bars 23, coacting with the cross-heads 3, will prevent the plunger or follower 15 from moving upward, and the latter now serves the purpose of a fixed platen, against which the final compression is made. Power is now applied to the shaft 44, which slowly operates the worms 39 and 40 through the medium of the worm 43 and worm-wheel 42 and rotates the eccentric rollers or cams, and as the latter roll on each other the upper shafts or journals 32 32 are caused to slowly ascend, which of course moves the movable platen 25

upward and gives the final compression to the material between the two pans 52 and 53. It will be evident from an inspection of my drawings that owing to the gearing the upward movement is made very slowly and that as the rollers or cams are eccentrically set with relation to their axes the leverage increases as the upward movement is continued. I deem this very important, as by its use I secure a most powerful mechanism with very little wear and tear and an imperceptible amount of friction. When the rollers move just half-way around, then the axes are at their extreme positions, and the bale is now compressed and power is shut off and the movement of the movable bed-plate stopped. I here wish to call particular attention to the shape of the interior of the knockdown frame 55 56, which is formed with an inward swell or convex portion 57, which as the material is pressed causes a corresponding concave surface between the pans, as seen in Fig. 2, so that it will not be difficult to secure a fastening device to the pans. Some method of fastening the pans 52 and 53 must now be performed, and this is accomplished by first pushing the sliding crib 10 slightly upward and then removing the knockdown frame 55 56, which may be done by removing the two screws securing the parts together. A fastening-strip 60, provided with hooked flanges 61 and 62, is then bent around the bale, so that the hooked flanges 61 and 62 are in the proper position to coact with similarly-hooked flanges 52^a and 53^a on the pans 52 and 53. In order to cause the hooked flanges to properly engage each other, I prefer to first wedge or force a bar 63 between the rear side of the fastening-strip 60 and the posts 2 2, then force end bars 64 and 65 between the ends of said strip 60 and said posts 2 2, and finally force a pair of thin bars 66 and 67 on the front, all as clearly seen in Fig. 7, in which the bale is shown in dotted lines. As the bars 66 and 67 have a space left between them, a suitable tool can be inserted to bend down the tongue 68, which must previously have been inserted through the slot 69. The fastening-strip is now held closely against the pans 52 and 53; but the hooked flanges are not in engagement with each other. To make them engage each other, the operator applies power to the shaft 44, which through the intermediate gearing causes the movable bed-plate 25 to descend, and the expansive force of the cotton causes the pans to separate sufficiently to engage the hooked flanges of the locking-strip 60 with the hooked flanges of the pans 52 and 53, when said pans will be securely locked together. The bars 63, 64, 65, and 66 may now be removed, and after the movable bed-plate has been allowed to descend the covered bale may be removed from the press ready in every respect for shipment. From the foregoing it will be seen that I have invented and produced a simple press for baling cotton and other material which is

so simple and yet so very efficient that it can be used on the plantation to entirely compress the bale in a single machine instead of two, as are now generally employed. It will also be seen that when the material is baled it is in a fire and water proof covering that not only makes shipping and storing much safer, but materially reduces the care necessary in its handling, as well as the insurance rates, which are high for the old style of coverings.

I have shown in my drawings what I consider one of the embodiments of my invention; but it will be manifest to all that I do not limit myself to the exact constructions and combinations shown, as various alterations or modifications may be made at will or one part or set of parts used without other parts without in any way departing from the line of my invention. Merely as examples it may be mentioned that the bars 50 may be made integral with the bed-plate 25 or they may be formed separately and secured thereon, and the teeth forming the worm-wheels 36 36 and 37 37 may be made integral with the eccentric rollers or they can be secured thereto, so as to rotate therewith. Hence where in my claims I have specified the eccentric rollers as having gears or worm-wheels formed thereon I mean to cover the eccentric rollers made with teeth in any way equivalent to that shown.

What I claim as new is—

1. In a machine of the character described, a pressure chamber or crib, a follower and mechanism for compressing the material comprising a pair of eccentric rollers or cams arranged to roll on each other and thereby operate said follower, and a worm operating between said eccentric rollers and arranged to rotate the same, substantially as described.

2. In a machine of the character described, a pressure chamber or crib, a follower or bed-plate for compressing material therein, an eccentrically-set roller or cam carried by said follower or bed-plate, and a second roller suitably supported, said rollers rolling on each other, and a worm operating between said rollers for rolling one of them on the other, substantially as described.

3. In a machine of the character described, a pressure chamber or crib, and mechanism for compressing the material therein comprising a pair of eccentrically-set rollers or cams, a pair of rollers in rolling contact therewith, and a worm for operating said rollers, substantially as described.

4. In a machine of the character described, a pressure chamber or crib, and mechanism for compressing the material therein comprising a pair of eccentrically-set rollers, a pair of eccentrically-set rollers or cams in contact with the first-mentioned rollers or cams, the said rollers having gears formed thereon, and a worm meshing with and rotating said geared rollers or cams, substantially as described.

5. In a machine of the character described, a pressure chamber or crib, and mechanism for compressing the material therein compris-

ing a pair of eccentrically-set rollers or cams arranged to roll on each other, and a worm arranged to rotate said rollers and capable of moving to accommodate itself to the movement of said rollers or cams, substantially as described.

6. In a machine of the character described, a pressure chamber or crib and mechanism for compressing the material therein comprising two pairs of eccentrically-set rollers or cams having gearing thereon, a shaft provided with a worm near each end thereof for meshing in the gearing on said eccentrically-set rollers and arranged to rotate the same, substantially as described.

7. In a machine of the character described, a pressure chamber or crib, and mechanism for compressing the material therein comprising two pairs of eccentrically-set rollers or cams arranged to roll on each other and having worm-wheels thereon, a shaft having a worm near each end thereof meshing between the worm-wheels on said rollers and means for rotating said shaft, substantially as described.

8. In a machine of the character described, a pressure chamber or crib and mechanism for compressing the material therein comprising two pairs of eccentrically-set rollers or cams arranged to roll on each other whereby the axes of one set have vertical movement, worm-wheels forming part of said rollers, a shaft having a worm near each end thereof arranged to gear with the worm-wheels on said rollers, said shaft capable of movement as the axis of one pair of said rollers moves, substantially as described.

9. In a machine of the character described, a pressure chamber or crib and mechanism for compressing the material therein comprising two pairs of eccentrically-set rollers or cams arranged to roll on each other whereby the axes of one set have vertical movement, worm-wheels forming part of said rollers, a shaft having a worm near each end thereof arranged to gear with the worm-wheels on said rollers, means for supporting said shaft capable of movement to adapt said worms to the movement of said rollers, substantially as described.

10. In a machine of the character described, a pressure chamber or crib, a follower or bed-plate for compressing the material therein, two pairs of eccentrically-set rollers coacting with said follower or bed-plate and arranged to move the latter as they roll on each other, worm-wheels forming part of said rollers or cams, a shaft having a worm near each end thereof meshing with the worm-wheels on said rollers or cams, a worm-wheel on said shaft and a shaft and worm for operating said worm-wheel, substantially as described.

11. In a machine of the character described, a pressure chamber or crib, a follower or bed-plate for compressing the material therein, two pairs of eccentrically-set rollers coacting

with said follower or bed-plate and arranged to move the latter as they roll on each other, worm-wheels forming part of said rollers or cams, a shaft having a worm near each end thereof meshing with the worm-wheels on said rollers or cams, a worm-wheel on said shaft and a shaft and worm for operating said worm-wheel, the said shafts and worms having movement corresponding to the movement of the follower or bed-plate, substantially as described.

12. In a machine of the character described, two cribs having walls forming a pressure-chamber of the same internal dimensions and of uniform size and arranged to telescope or slide one in the other during the compression of the material, substantially as described.

13. In a machine of the character described, a crib having one part with its members projecting therefrom with spaces left between them, and a second part having members also projecting therefrom and telescoping between the members of the opposing part, substantially as described.

14. In a machine of the character described, a crib having a stationary part with its members projecting downward therefrom with spaces left between them, and a second part having members projecting upward and telescoping between the members of the upper part, substantially as described.

15. In a machine of the character described, a pressure chamber or crib and a frame for use therewith having an inwardly-swelled or convex portion tending to form a corresponding concave depression in the bale, substantially as described.

16. In a machine of the character described, a pressure chamber or crib and a knockdown frame for use therewith having an inwardly-swelled or convex portion tending to form a corresponding concave depression in the bale, substantially as described.

17. In a machine of the character described, a pressure chamber or crib and a knockdown frame for use therewith having an inwardly-swelled portion adapted to form a corresponding concave depression in the bale, and openings or slots in said frame permitting the air to escape as the material is compressed, substantially as described.

18. In a machine of the character described, a pressure chamber or crib, a follower or bed-plate having means for supporting the bottom and sides of a pan or section of the bale-covering, a removable frame coacting with said supporting means, and means for compressing the material into said pan or section, substantially as described.

19. In a machine of the character described, a pressure chamber or crib, a follower or bed-plate having a recess formed therein arranged to support the bottom and sides of a pan or section of the bale-covering, a removable frame coacting with said recess and forming a continuation thereof, and means for com-

pressing the material into said pan or section, substantially as described.

20. In a machine of the character described, a pressure chamber or crib, a follower or bed-plate having a recess formed therein for supporting the bottom and sides of a pan or section of the bale-covering, a knockdown frame arranged to be supported above said recess and forming a continuation thereof, and means for compressing material into said frame and pan or section of the bale-covering, substantially as described.

21. In a machine of the character described, a pressure chamber or crib, means for compressing material between pans or sections of the bale-covering arranged in said pressure chamber or crib, and means for holding a fas-

tening-strip against said pans or sections of the bale-covering, substantially as described.

22. In a machine of the character described, a pressure chamber or crib, means for compressing material between pans or sections of the bale-covering arranged in said pressure chamber or crib, and detachable bars for holding a fastening-strip against said pans or sections of the bale-covering, substantially as described.

Signed by me at Lynchburg this 22d day of August, 1901.

MICHAEL KIRSHNER.

Witnesses:

R. H. GLASS, Jr.,
M. K. PIERSON.