G. L. GRAY.

GRASS TWINE MACHINE.

APPLICATION FILED DEC. 13, 1910.

1,010,360.

Patented Nov. 28, 1911.

5 SHEETS—SHEET 1.

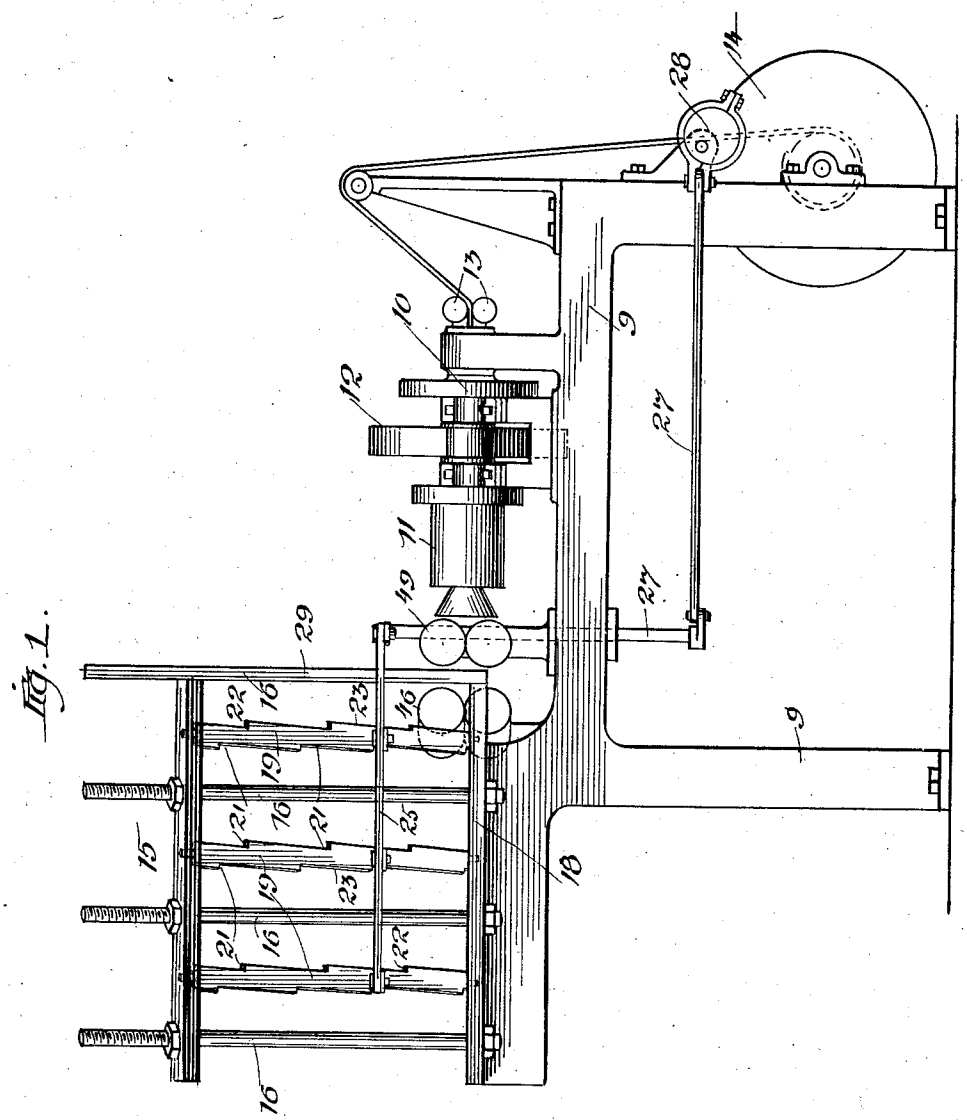

Fig. 1.

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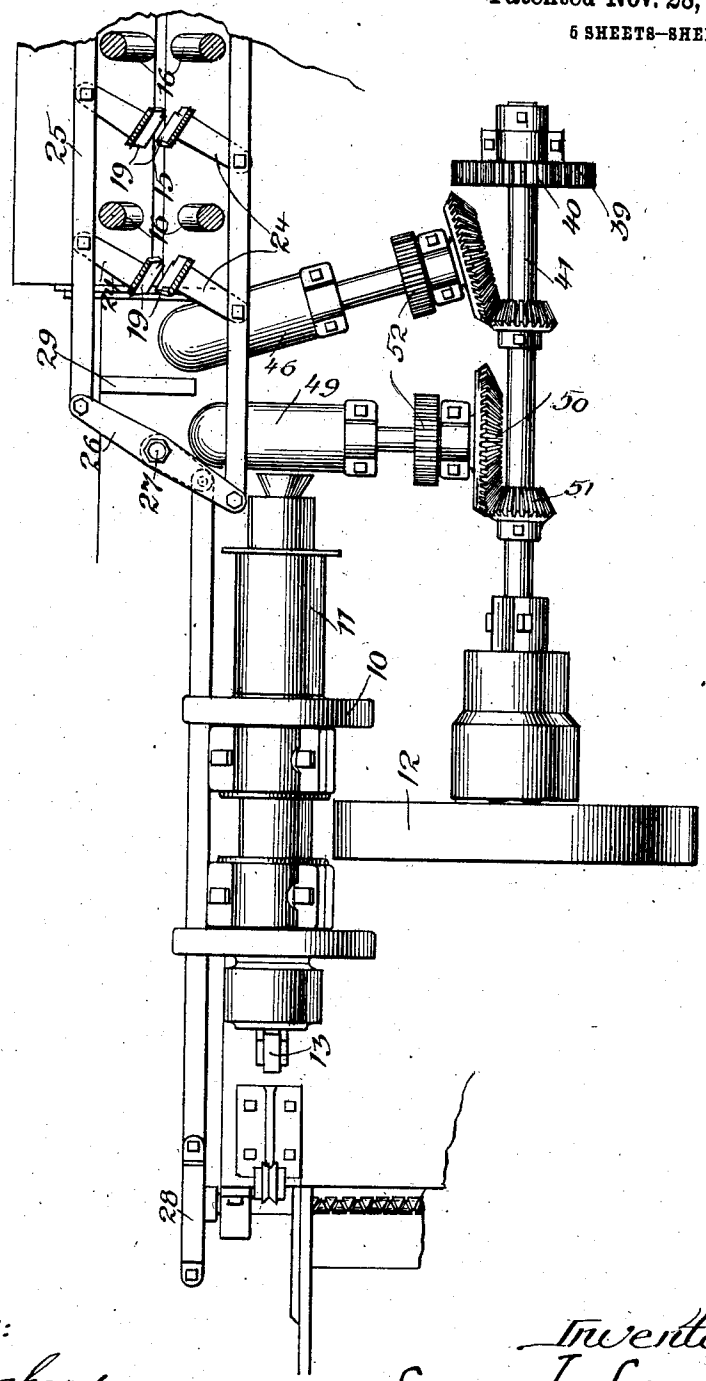
5 SHEETS—SHEET 2.

Fig. 2.



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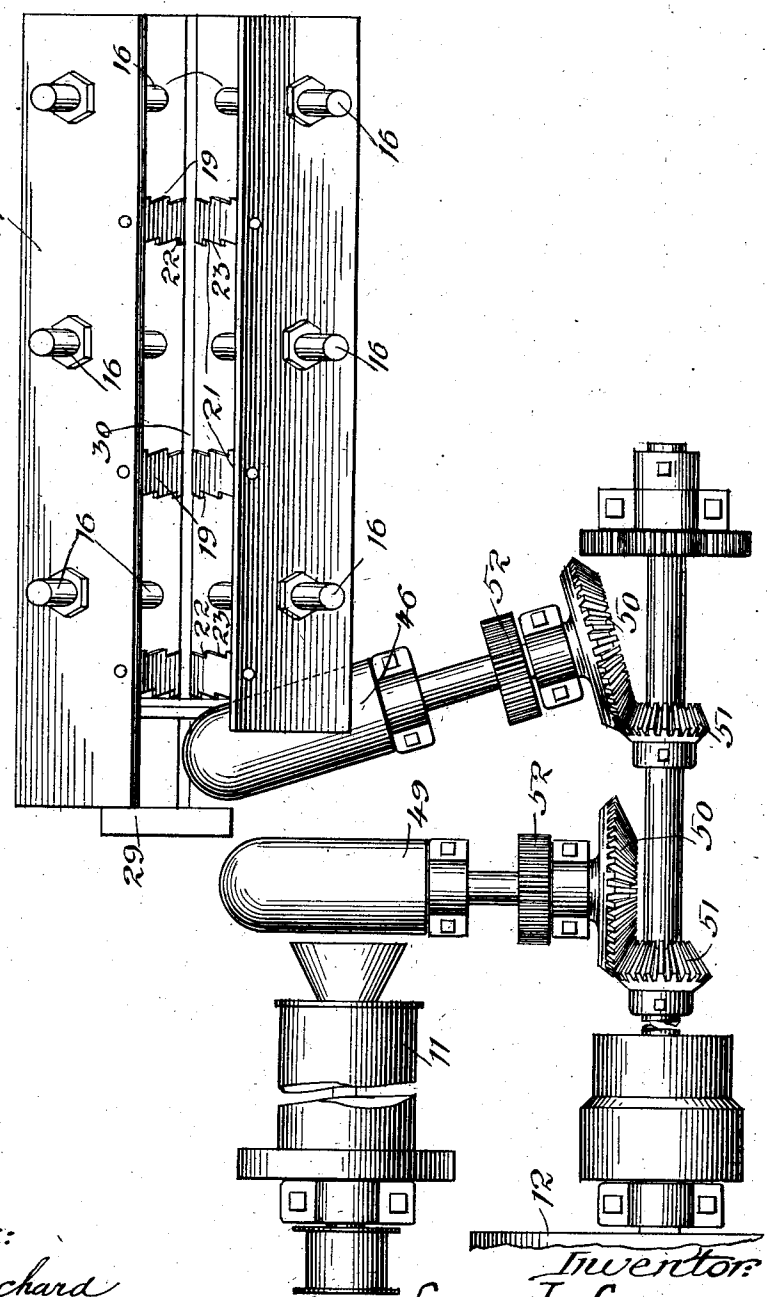
5 SHEETS—SHEET 3.

Fig. 3.



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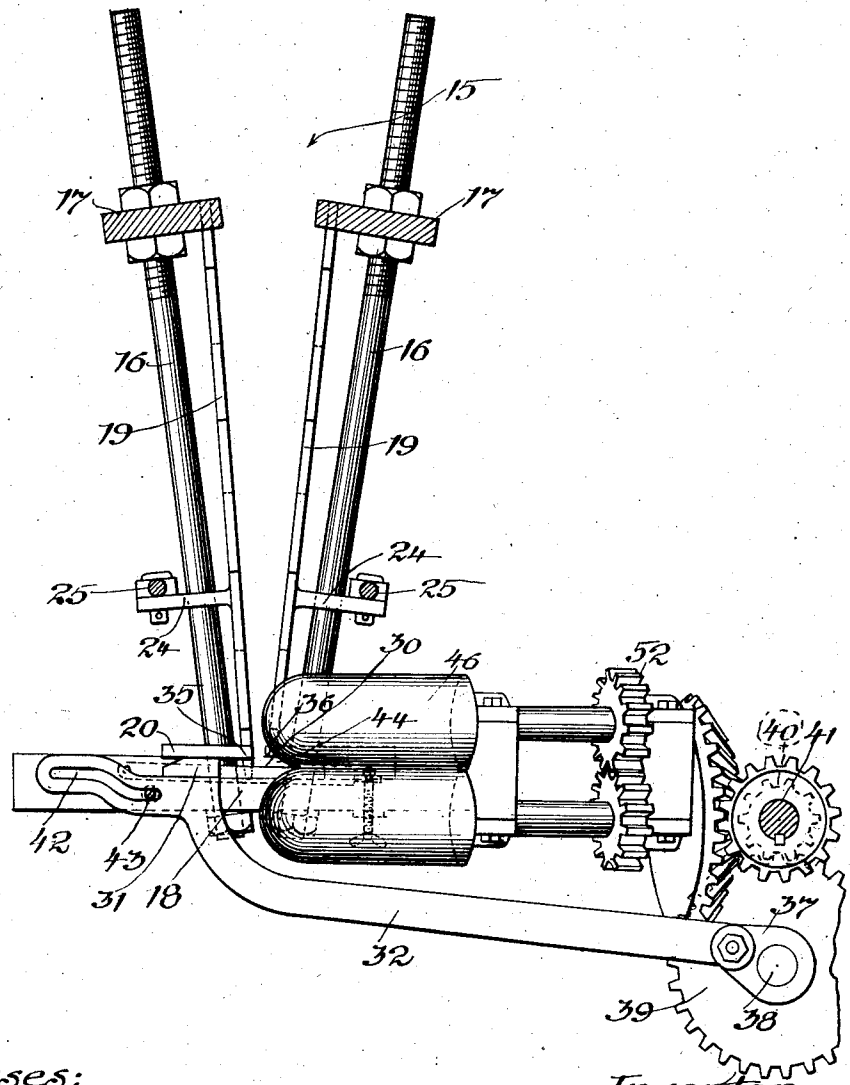
5 SHEETS—SHEET 4.

Fig. 4.



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5 SHEETS—SHEET 5.

Fig. 5.

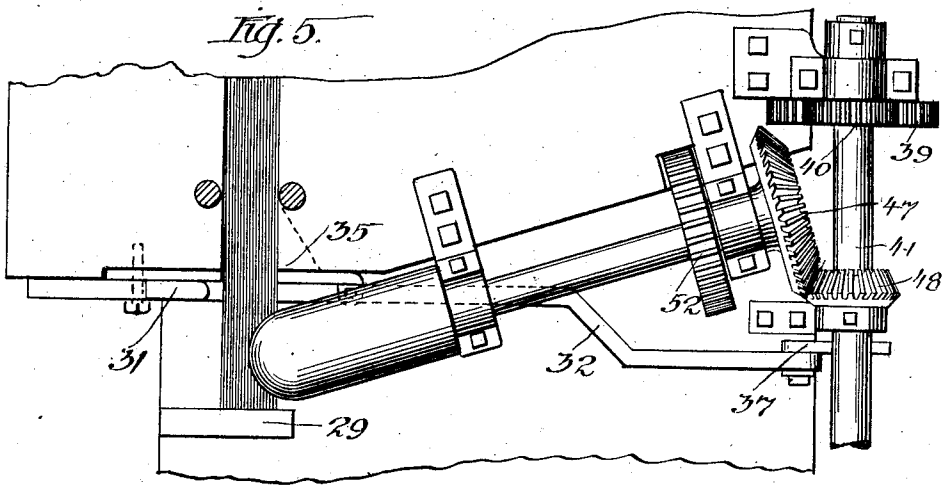


Fig. 6.

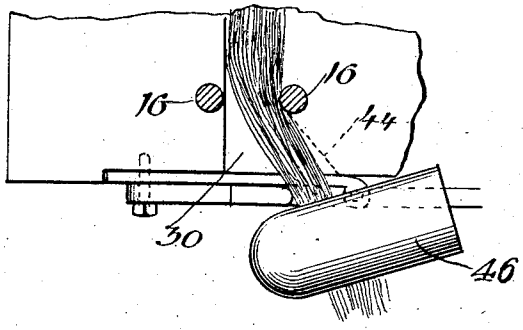


Fig. 7.

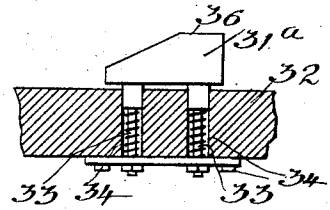
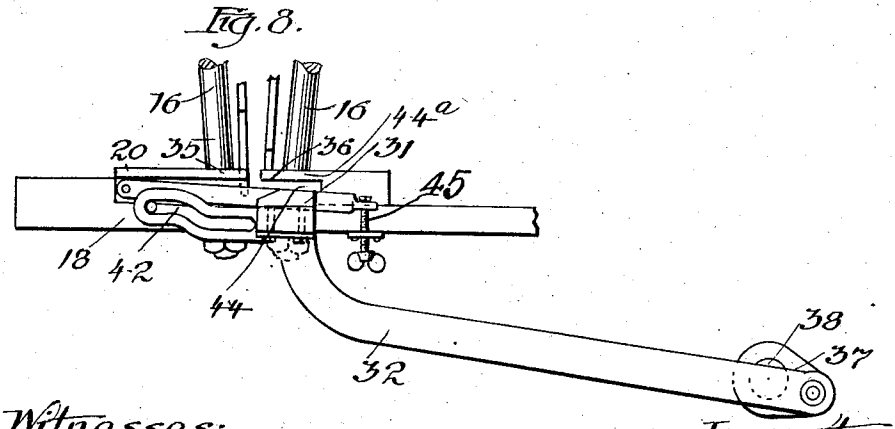


Fig. 8.



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UNITED STATES PATENT OFFICE.

GEORGE L. GRAY, OF WEST PALMBEACH, FLORIDA.

GRASS-TWINE MACHINE.

1,010,360. Specification of Letters Patent. Patented Nov. 28, 1911.

Application filed December 13, 1910. Serial No. 597,156.

To all whom it may concern:

Be it known that I, GEORGE L. GRAY, a citizen of the United States, residing at West Palmbeach, in the county of Palm Beach and State of Florida, have invented certain new and useful Improvements in Grass-Twine Machines, of which the following is a specification.

The present invention relates to a machine for forming a grass twine used in the manufacture of grass carpet and similar articles.

The invention relates more particularly to the construction of the holder for the grasses; to the mechanism for feeding the grasses downwardly in the holder; to the mechanism for conveying the grasses from the lower end of the holder into position to be engaged by the feed rolls; and to the arrangement and location of the feed rolls.

The objects of the invention are to so arrange the operating parts that the grasses in being fed from the lower end of the holder into position to be engaged by the feed rolls will move a relatively short distance and in a practically parallel plane with the lower end of the holder, whereby the downward bending of the grasses is entirely eliminated, thus enabling the short lengths of grass to be fed into position to be engaged by the feed rolls, the only bending of the grasses necessary being one to carry them from the center of the holder over into alinement with the center of the binding mechanism.

Another object of the invention is to so arrange the mechanism for feeding the grasses downward in the receptacle or holder, that a sidewise movement will be imparted to the grasses, first toward one side of the holder, and then toward the other, the grasses during such sidewise movement being compressed; and the mechanism is so arranged that intermittent each sidewise or compression movement the grasses are released, whereby they will drop downward into the holder, this action being identical with a vibrating or shaking action imparted to the grasses, which would tend to compact them and so force them downward.

Further objects of the invention are, to provide the edges of the blades which perform the feeding operation within the holder with a plurality of notches, which are so angled as to assist the grasses in the downward movement; to locate at least one set of feed rolls at an angle to the straight line of travel of the grasses, whereby the grasses will be deflected into the proper path to carry them into the wrapping mechanism; to permit a portion of the grasses to drop below the holder at each operation of the blades and to provide means for sustaining them in such position; and to provide a member which will operate below and at the forward end of the holder, and in a path in alinement with the grasses lying below the holder, so as to bend the ends of the grasses protruding beyond the holder into a position to be engaged by the feed rolls.

The invention further consists in the features of construction and combination of parts hereinafter described and claimed.

In the drawings, Figure 1 is a side elevation showing the mechanism of the present invention in conjunction with the operating parts of a grass twine machine; Fig. 2, a plan view of the parts shown in Fig. 1; Fig. 3, an enlarged plan view of the holder, feed rolls, and mechanism for conveying the ends of the grasses from the holder to be engaged by the feed rolls; Fig. 4, a vertical section through the holder, showing the feed rolls and mechanism for conveying the ends of the grasses from the holder into position to be engaged by the feed rolls; Fig. 5, a detail showing a plan view of the lower end of the holder, with the grasses projecting out therefrom; Fig. 6, a view similar to Fig. 5, showing the ends of the grasses in their bent position; Fig. 7, a detail of the finger or dog which engages the ends of the grasses; and Fig. 8, a detail of the lower portion of the mechanism shown in Fig. 4, with the feed rolls and feeding mechanism for the ends of the grasses removed.

The device is shown as applied and used in conjunction with a grass twine-forming mechanism, which is mounted upon a framework 9, said mechanism consisting of a suitable spindle 10 connected to a thread-containing spool 11, which is driven by a power wheel 12, the completed grasses passing between tension rollers 13 and onto a suitable drum 14. It is understood, however, that this particular type of binding mechanism is merely shown for the purpose of showing the feeding mechanism of the present invention applied to a grass twine machine, that the construction and opera-

tion of the binding or twine-forming mechanism is not deemed to be a part of this invention, and that the feeding mechanism of the present invention can be applied equally as well to other forms of binding mechanism.

The holder 15 consists of a plurality of fixed rods 16 extending vertically and at an angle so as to converge toward their lower ends. These posts 16, as shown, are oppositely disposed from one another and are secured within plates 17 lying adjacent their upper ends and within a plate 18 which forms the base of the machine. As shown more clearly in Fig. 3, the posts are lying opposite to one another, whereby the post on one side acts in conjunction with the post opposite thereto to constitute the sets of posts hereinafter referred to. And interposed between each set of posts are blades 19, having their upper ends pivotally mounted within the plates 17, and their lower ends, as shown, mounted within a plate 20 at the lower portion of the machine, although it is understood that the method of mounting these plates and posts can be varied to suit the style or arrangement of the machine, or to comply with the ideas of the mechanic constructing the machine.

The blades, as shown more clearly in Fig. 4, extend vertically of the holder and are lying at an angle to converge toward their lower ends, the angle of convergence of the blades being somewhat greater than the angle of convergence of the posts, whereby the lower ends of the blades are spaced a relatively short distance apart, thereby providing, at the lower end of the holder, a relatively contracted outlet for the grasses, so that a relatively small amount of grasses will be allowed to pass out from the holder and lie therebelow with each operation of the blades.

The blades, as shown more clearly in Fig. 1, are provided with a series of notches 21. These notches comprise a relatively short angled face 22 and a long angled face 23. As shown in Fig. 1, the notches are so arranged that the protruding points of one blade will register with the recesses in the blade next adjacent. This arrangement of the notches serves to assist in the downward feeding of the grasses during the operation of the machine, the relatively short angled faces 22 engaging the grasses and forcing them downward along the relatively long angled faces 23.

The blades, as shown in Fig. 2, are connected to outwardly extending arms 24, which in turn are connected to bars 25 connected to a centrally pivoted connecting bar or cross head 26, which is operated with a rocking movement by means of a rod 27, operated from an eccentric 28, as shown more clearly in Fig. 1. It is understood, however, that this particular means of operating these blades is merely shown for the purpose of illustrating the method of operation, since there are obviously various other well known means for obtaining this same result, all of which lie well within the scope of the ordinary mechanic to design.

By means of the rocking movement imparted to the connecting bar 26, one of the levers 25 is moved in the opposite direction from the other, whereby a swinging movement is imparted to the arms 24, which move the blades 19 into the position shown in Fig. 2, when the connecting bar is thrown into the position shown therein, and which throws the blades into a directly opposite angle when the connecting bar is moved to a position the reverse of that shown in Fig. 2.

During the period when the ends of the connecting bar are in direct alinement with the pivotal center of the bar, that is, when the bar is in its straight or central position, the ends of the bars 25 will be in alinement and the arms 24 will be at right angles to the bars 25; hence, the blades 19 will lie straight up and down with respect to the sides of the holder 15, as shown in Fig. 3, and not at an angle with respect to the sides of the holder as shown in Fig. 2. This movement of the blades, namely, first at an angle in one direction with respect to the sides of the holder; then into a position substantially parallel with the sides of the holder; then at an angle with respect to the sides of the holder opposite from the first mentioned angle; causes the grasses to be forced under compression, first, toward one side of the holder, then to be released from said compression and allowed to assume an expanded position within the holder, and then to be compressed and forced toward the opposite side of the holder, and then to be released from such compression and allowed to expand within the holder. This imparts a movement to the grasses within the holder which is similar, in effect, to a shaking or vibration thereof, which, as is well known, will result in a compressing of the grasses, thus naturally causing them to descend and settle toward the bottom of the holder; and, as heretofore stated, the notches of the edges of the blades formed in the manner set forth serves to assist in this downward feeding operation.

The posts 16 serve as outer or side walls of the holder to confine the grasses within the proper bounds, and also serve to reinforce and strengthen the structure as a whole. And located in front of the holder and spaced away therefrom, as shown more clearly in Figs. 2 and 5, is an abutting board 29, which extends vertically with respect to the holder and against which the front ends

of the grasses abut during their movement down within the holder. The grasses, when released from the lower ends of the blades 19, are lying at the bottom 30 of the holder, as more clearly shown in Fig. 4, the ends of the grasses protruding out beyond the end of the holder, as shown in Fig. 5. These ends of the grasses, however, are free of the plate forming the bottom of the holder, that is, they overhang therefrom; and operating in alinement with the overhanging ends of the grasses and along the front edge of the holder, as also more clearly shown in Fig. 5, is a dog or finger 31 connected to a rod or bar 32, more clearly shown in Fig. 4.

As shown in Fig. 7, the dog 31 is secured to the bar 32 by means of stems 33 depending from the dog, which are entered within recesses 34 within the bar; and a spring pressure is maintained on said stems, tending to maintain the dog 31 in its proper elevated position. This manner of mounting the dog, however, is not deemed an essential part of the present invention and is merely embodied in the case so as to show a manner of mounting the dog to compensate for the necessary wearing away of the upper edge thereof, since said upper edge is constantly traveling beneath a flange 35 on the plate 20. The upper edge 36 of the dog is wide enough to span the space between the plate 20 and a similar plate 36 on the opposite side of the holder, so that an undue upward movement of the dog is prevented, as, obviously, were it to spring upward and enter into the space between the plates 20 and 36, the front face of the dog would strike the plate 36 and movement of the dog would thus be checked at each operation.

The bar 32 is connected to a crank arm 37 mounted upon a shaft 38, on which is mounted a gear wheel 39 meshing with a pinion 40 mounted upon a main driving shaft 41; and the outer end of the bar 32 is formed with a cammed slot 42, into which is entered a fixed pin 43. This gives an oscillating movement to the arm in addition to the reciprocating movement imparted to it by the crank arm 37. This double movement is employed so that upon the backward movement of the arm, the upper edge of the dog will clear the grasses lying below the holder, so that the ends of the grasses will only be bent in one direction by the actions of the dog, namely, in the direction shown in Fig. 6. Other means may be used for imparting movement to the bar and dog, and while in the present instance only one bar and dog are shown, a construction is contemplated which would employ more than one bar and dog, the adjacent bars and dogs operating intermittently with respect to one another.

As shown more clearly in Fig. 6, when the ends of the grasses are engaged by the dog, they are bent so as to lie in a slot 44 formed in a plate 44^a. This slot 44, as shown, is of a tapered formation extending toward the front of the plate and producing a triangular shaped slot. Through the medium of suitable adjusting mechanism 45, shown in Fig. 8, the plate 44^a may be adjusted with respect to the base plate, whereby the depth of the slot 44 may be varied so that a greater or less amount of grasses can be accommodated therein. The grasses, when forced into the slot 44, have their ends brought into position where they enter into the bite of feed rolls 46, which, as shown more clearly in Fig. 3, are lying at an angle with respect to the holder and are driven by means of a bevel gear 47 meshing with a bevel gear 48 on the main driving shaft 41.

Each set of feed rolls comprises two rolls, as shown in Fig. 4, and the rolls are preferably rounded at their forward ends so as to permit of an easy entrance of the grass therebetween, and are provided with a milled surface to enable them to obtain a firm and substantial bite upon the grasses. As shown in the drawings, there are two sets of feed rolls employed, although, obviously, this number can be changed to suit the working conditions. The second set of feed rolls 49 is lying at right angles to the grasses within the holder, whereas the feed rolls 46 are lying at an oblique angle. The oblique angle of the rolls 46 serves to carry the grasses from the center of the holder over into the center of the binding mechanism, as, since the centers of the holder and binding mechanism are not in alinement, some means must be provided for carrying the grasses from the holder over into position in alinement with the center of the binding mechanism. The oblique position of the feed rolls 46 will serve to force the grasses along at the same angle of travel that the ends assume when they are engaged by the dog and forced out from the center of the lower end of the holder; and when the ends of the grasses are engaged by the feed rolls 49, the oblique movement of the grasses will be checked, and they will continue in a line of travel parallel to the central line of the binding mechanism. The feed rolls 49 are driven through the medium of a bevel gear 50 meshing with a bevel gear 51 driven by the shaft 41, and the upper and lower feed rolls of each set of feed rolls is driven simultaneously by means of intermeshing spur gears 52.

The operation will be understood from the foregoing, but briefly is as follows: The grass, after being put through the usual combing operation, is placed by the operator into the holder. Thence, through the actuation of the blades 19, a vibrating movement is imparted thereto, tending to compact the

grasses within the holder and cause them to settle downwardly therein. By this alternating compression and relaxation of the grasses, they are finally fed to the lower end 30 of the holder, and as at each relaxation of the blades upon the grasses, a certain amount of the grasses reaches the bottom of the holder, an intermittent feeding of a small amount of grasses to the bottom of the holder is produced. When the grasses reach the lower end 30 of the holder, the dog 31 traveling across this opening engages the overhanging ends of the grasses and bends them into the position shown in Fig. 6, where they will be brought into the bite of the rolls 46 and fed forward into engagement with the rolls 49, and from these rolls are fed into the spindle and other portions of the binding mechanism. The abutting board serves as a means for limiting the outward movement of the grasses during the travel downward through the holder, whereby, when they finally reach the lower end of the holder, the forward ends are not projecting an undue amount beyond the front end of the holder.

I claim:

1. In a grass twine machine, the combination of a holder for the grasses, mechanism for feeding the grasses downwardly in the holder, said mechanism comprising a framework, feeding blades pivotally mounted in said framework, mechanism operatively connected for imparting an oscillating movement to the said blades to move them in and out transversely of the holder, said blades being set at an angle to converge toward their lower ends, substantially as described.

2. In a grass twine machine, the combination of a holder for the grasses, mechanism for feeding the grasses downwardly in the holder, said mechanism comprising pivotally mounted feed members, mechanism operatively connected for imparting an oscillating movement to said members about their pivotal centers, whereby they will compress the grasses, first toward one side of the holder and then toward the other, and whereby the grasses will be released from compression between said sidewise movements and allowed to fall downward in the holder, said feed members being provided with notched edges to assist in the downward crowding of the grasses, substantially as described.

3. In a grass twine machine, the combination of a holder for the grasses, mechanism for feeding the grasses downwardly in said holder, said mechanism comprising a framework, feeding blades pivotally mounted in said framework, mechanism operatively connected for imparting an oscillating movement to said blades about their pivotal centers and move them in and out with a movement transversely of the holder, said blades being set at an angle to converge toward their lower ends and being provided with notched edges to assist in the downward crowding of the grasses, substantially as described.

4. In a grass twine machine, the combination of a holder for the grasses, mechanism for feeding the grasses downwardly in said holder, said mechanism comprising a framework, feeding blades pivotally mounted in said framework, mechanism operatively connected for imparting an oscillating movement to said blades about their pivotal centers, said blades being set at an angle to converge toward their lower ends and being provided with notches along their edges to assist in the downward crowding of the grasses, the projecting portions along one edge of the blades registering with the recessed portions along the edges of the blade next adjacent, substantially as described.

5. In a grass twine machine, the combination of a holder for the grasses, mechanism for feeding the grasses downwardly in said holder, said mechanism comprising pivoted feed members, a mounting for said feed members, mechanism operatively connected for imparting an oscillating movement to said members about their pivotal centers, to move the members in and out transversely of the holder, whereby they will compress the grasses, first toward one side of the holder and then toward the other, and whereby the grasses will be released from compression between said movements and allowed to fall downward in the holder, and posts arranged along the sides of the holder and constituting the fixed side walls thereof, substantially as described.

6. In a grass twine machine, the combination of a holder for the grasses, mechanism for feeding the grasses downwardly in said holder, said mechanism comprising a framework, feeding blades pivotally mounted in said framework, mechanism operatively connected for imparting an oscillating movement to said blades about their pivotal centers, whereby they are moved in and out transversely of the holder, said blades being set at an angle to converge toward their lower ends, and posts arranged along the sides of the holder and constituting the fixed side walls thereof, substantially as described.

7. In a grass twine machine, the combination of a holder for the grasses, mechanism for feeding the grasses downwardly in said holder, said mechanism comprising a framework, feeding blades pivotally mounted in said framework, mechanism operatively connected for imparting an oscillating movement to said blades about their pivotal centers to move them in and out transversely

of the holder, said blades being set at an angle to converge toward their lower ends, and posts arranged along the sides of the holder and constituting the fixed side walls thereof, said posts converging toward their lower ends at a less angle than the angle of convergence of the blades, substantially as described.

8. In a grass twine machine, the combination of a holder for the grasses, mechanism for feeding the grasses transversely in said holder, said mechanism comprising feed members, a mounting for said feed members in which they are pivotally secured, mechanism operatively connected for imparting an oscillating movement to said members about their pivotal centers transversely of the holder, whereby they will compress the grasses, first toward one side of the holder and then toward the other, and whereby the grasses will be released from compression between said sidewise movements and allowed to fall downward into the holder, said feed members being provided with notched edges to assist in the downward crowding of the grasses, and posts arranged along the sides of the holder and constituting the fixed side walls of the holder, substantially as described.

9. In a grass twine machine, the combination of a holder for the grasses, mechanism for feeding the grasses downwardly in said holder, said mechanism comprising a framework, feeding blades pivotally mounted in said framework, mechanism operatively connected for imparting an oscillating movement to said blades to move them in and out transversely of said holder, said blades being set at an angle to converge toward their lower ends and being provided with notched edges to assist in the downward crowding of the grasses, and posts arranged along the sides of the holder and constituting the fixed side walls thereof, substantially as described.

10. In a grass twine machine, the combination of a holder for the grasses, mechanism for feeding the grasses downwardly in said holder, said mechanism comprising feed members, a mounting for said feed members in which they are pivotally secured, mechanism operatively connected for imparting an oscillating movement to said members about their pivotal centers transversely of said holder, whereby they will compress the grasses, first toward one side of the holder and then toward the other, and whereby the grasses will be released from compression between said sidewise movements and allowed to fall downward in the holder, and an abutting board at the front of the holder, against which the ends of the grasses abut, substantially as described.

11. In a grass twine machine, the combination of a holder for the grasses, mechanism for feeding the grasses downwardly in said holder, said mechanism comprising a framework, feeding blades pivotally mounted in said framework, mechanism operatively connected for imparting an oscillating movement to said blades to move them in and out transversely of the holder, said blades being set at an angle to converge toward their lower ends, and an abutting board at the front of the holder, against which the ends of the grasses abut, substantially as described.

12. In a grass twine machine, the combination of binding mechanism, a holder for the grasses, having its lower end in approximately the same plane with the center of the binding mechanism, mechanism for feeding the grasses downwardly in said holder, companion sets of feed rolls, each set of rolls having its point of juncture in approximately the same plane with the lower end of the holder, at least one of said sets of rolls lying at an angle with respect to the grasses in the holder, and means for conveying the grasses from the lower end of the holder into position to be engaged by the feed rolls, substantially as described.

13. In a grass twine machine, the combination of a holder for grasses, means for feeding the grasses downwardly in the holder, feed rolls, means for conveying the grasses from the lower end of the holder into position to be engaged by the feed rolls, said means comprising a member located below said holder, and means for operating said member with a reciprocating movement crosswise of the grasses and in a path of travel to engage the grasses at the lower end of the holder, substantially as described.

14. In a grass twine machine, the combination of a holder for grasses, means for feeding the grasses downwardly in the holder, means for conveying the grasses from the lower end of the holder into position to be engaged by the feed rolls, said means comprising a member located below the holder, a finger carried by said arm, and means for operating said arm with a combined reciprocating and oscillating movement in a direction crosswise of the grasses and in a path of travel to engage the grasses at the lower end of the holder, substantially as described.

15. In a grass twine machine, the combination of a holder for grasses, means for feeding the grasses downwardly in the holder, feed rolls, means for conveying the grasses from the lower end of the holder into position to be engaged by the feed rolls, said means comprising a member located below said holder, means for operating said member with a reciprocating movement crosswise of the grasses and in a path of travel to engage the ends of the grasses, and a plate at the lower end of the holder, hav-

ing a recess into which the ends of the grasses are turned in feeding the grasses from the lower end of the holder into position to be engaged by the feed rolls, substantially as described.

16. In a grass twine machine, the combination of binding mechanism, a holder for the grasses, mechanism for feeding the grasses downwardly in said holder, comprising movable feed members, mechanism operatively connected for imparting an oscillating movement to said members, whereby a vibratory movement is imparted to the grasses within the holder, compacting and forcing them downward therein, feed rolls having their point of juncture in approximately the same plane with the lower end of the holder, means for conveying the grasses from the lower end of the holder into position to be engaged by the feed rolls, the lower end of the holder lying in approximately the same plane with the center of the binding mechanism, substantially as described.

17. In a grass twine machine, the combination of binding mechanism, a holder for the grasses, mechanism for feeding the grasses downwardly in said holder, comprising pivotally mounted feed members, mechanism operatively connected for imparting an oscillating movement to said members about their pivotal centers, whereby a vibratory movement is imparted to the grasses within the holder, compacting and forcing them downward therein, companion sets of feed rolls, each set of rolls having its point of juncture in approximately the same plane with the lower end of the holder, at least one of said sets of feed rolls lying at an angle with respect to the holder, means for conveying the grasses into position to be engaged by the feed rolls, the lower end of the holder lying in approximately the same plane with the center of the binding mechanism, substantially as described.

18. In a grass twine machine, the combination of binding mechanism, a holder for the grasses, means for feeding the grasses downwardly within the holder, comprising a framework, feeding blades pivoted in said framework, mechanism operatively connected for imparting an oscillating movement to said blades, said blades being set at an angle to converge toward the lower end of the holder, feed rolls having their point of juncture in approximately the same plane with the lower end of the holder, means for conveying the grasses from the lower end of the holder into position to be engaged by the feed rolls, the lower end of the receptacle lying in approximately the same plane with the center of the binding mechanism, substantially as described.

19. In a grass twine machine, the combination of binding mechanism, a holder for the grasses, means for feeding the grasses downwardly within the holder, comprising a framework, feeding blades pivoted in said framework, mechanism operatively connected for imparting an oscillating movement to said blades, said blades being set at an angle to converge toward the lower end of the holder and being provided with notched edges to assist in the downward movement of the grasses, feed rolls having their point of juncture in approximately the same plane with the lower end of the holder, and means for conveying the grasses from the lower end of the holder into positions to be engaged by the feed rolls, the lower end of the holder lying in approximately the same plane with the center of the binding mechanism, substantially as described.

20. In a grass twine machine, the combination of binding mechanism, a holder for the grasses, means for feeding the grasses downwardly within the holder, comprising a framework, feeding blades pivoted in said framework, mechanism operatively connected for imparting an oscillating movement to said blades, said blades being set at an angle to converge toward the lower end of the holder, posts arranged along the sides of the holder and constituting the fixed side walls thereof, said posts converging toward the lower end of the holder at a less angle than the angle of convergence of the blades, feed rolls having their point of juncture in approximately the same plane with the lower end of the holder, and means for conveying the grasses from the lower end of the holder into position to be engaged by the feed rolls, the lower end of the holder lying in approximately the same plane with the center of the binding mechanism, substantially as described.

21. In a grass twine machine, the combination of binding mechanism, a holder for the grasses, mechanism for feeding the grasses downwardly in said holder, comprising pivotally mounted feed members, mechanism operatively connected for imparting an oscillating movement to said members about their pivotal centers, whereby a vibratory movement is imparted to the grasses within the holder, compacting and forcing them downward therein, feed rolls, means for conveying the grasses from the lower end of the holder into position to be engaged by the feed rolls, said means comprising a member located below said holder, and means for operating said member with a reciprocating movement crosswise of the grasses and in a path of travel to engage the grasses at the lower end of the holder, substantially as described.

22. In a grass twine machine, the combination of binding mechanism, a holder for the grasses, means for feeding the grasses downwardly within the holder, comprising

a framework, feeding blades pivoted in said framework, mechanism operatively connected for imparting an oscillating movement to said blades, said blades being set at an angle to converge toward the lower end of the holder, feed rolls, means for conveying the grasses from the lower end of the holder into position to be engaged by the feed rolls, said means comprising a member located below said holder and in alinement with the grasses at the lower end of the holder, and means for operating said member with a reciprocating movement crosswise of the grasses, substantially as described.

23. In a grass twine machine, the combination of binding mechanism, a holder for the grasses, mechanism for feeding the grasses downwardly in said holder, comprising pivotally mounted feed members, mechanism operatively connected for imparting an oscillating movement to said members about their pivotal centers, whereby a vibratory movement is imparted to the grasses within the holder, compacting and forcing them downward therein, feed rolls, means for conveying the grasses from the lower end of the holder into position to be engaged by the feed rolls, comprising an arm located below the holder, a finger carried by said arm, and means for operating said arm with a combined reciprocating and oscillating movement in a direction crosswise of the grasses and in a path to engage the grasses at the lower end of the holder, substantially as described.

24. In a grass twine machine, the combination of binding mechanism, a holder for the grasses, mechanism for feeding the grasses downwardly in said holder, comprising pivotally mounted feed members, mechanism operatively connected for imparting an oscillating movement to said members about their pivotal centers, whereby a vibratory movement is imparted to the grasses within the holder, compacting and forcing them downward therein, feed rolls having their point of juncture in approximately the same plane with the lower end of the holder, means for conveying the grasses from the lower end of the holder into position to be engaged by the feed rolls, comprising a member located below said holder, and means for operating said member with a reciprocating movement crosswise of the grasses and in a path of travel to engage the grasses at the lower end of the holder, substantially as described.

25. In a grass twine machine, the combination of binding mechanism, a holder for the grasses, mechanism for feeding the grasses downwardly in said holder, comprising pivotally mounted feed members, mechanism operatively connected for imparting an oscillating movement to said members about their pivotal centers, whereby a vibratory movement is imparted to the grasses within the holder, compacting and forcing them downward therein, feed rolls having their point of juncture in approximately the same plane with the lower end of the holder, means for conveying the grasses from the lower end of the receptacle into position to be engaged by the feed rolls, said means comprising an arm located below the holder, a finger carried by said arm, and means for operating said arm with a combined reciprocating and oscillating movement in a direction crosswise of the grasses and in a path of travel to engage the grasses at the lower end of the holder, substantially as described.

26. In a grass twine machine, the combination of binding mechanism, a holder for the grasses, mechanism for feeding the grasses downwardly in said holder, comprising pivotally mounted feed members, mechanism operatively connected for imparting an oscillating movement to said members about their pivotal centers, whereby a vibratory movement is imparted to the grasses within the holder, compacting and forcing them downward therein, companion sets of feed rolls, each set of rolls having its point of juncture in approximately the same plane with the lower end of the holder, at least one of said sets of feed rolls lying at an angle with respect to the holder, means for conveying the grasses from the lower end of the holder into position to be engaged by the feed rolls, comprising a member located below said holder, and means for operating said member with a reciprocating movement crosswise of the grasses and in a line of travel to engage the grasses at the lower end of the holder, substantially as described.

27. In a grass twine machine, the combination of binding mechanism, a holder for the grasses, having its lower end in approximately the same plane with the center of the binding mechanism, mechanism for feeding the grasses downwardly in said holder, feed rolls having their point of juncture in approximately the same plane with the lower end of the holder, a reciprocating member for conveying the grasses from the lower end of the holder into position to be engaged by the feed rolls, and a plate at the lower end of the holder, having a recess into which the ends of the grasses are turned in feeding them from the lower end of the holder into position to be engaged by the feed rolls, substantially as described.

28. In a grass twine machine, the combination of binding mechanism, a holder for the grasses, mechanism for feeding the grasses downwardly in said holder, feed rolls having their point of juncture in approximately the same plane with the lower end of

the holder, the lower end of the holder being in substantially the same plane with the center of the binding mechanism, means for conveying the grasses from the lower end of the holder into position to be engaged by the feed rolls, said means comprising a member located below said holder, means for operating said member with a reciprocating movement crosswise of the grasses and in a line of travel to engage the grasses at the lower end of the holder, and a plate at the lower end of the holder, having a recess into which the ends of the grasses are turned in feeding the grasses from the lower end of the holder into position to be engaged by the feed rolls, substantially as described.

GEORGE L. GRAY.

Witnesses:
W. I. METCALF,
HARRY BOTTS.