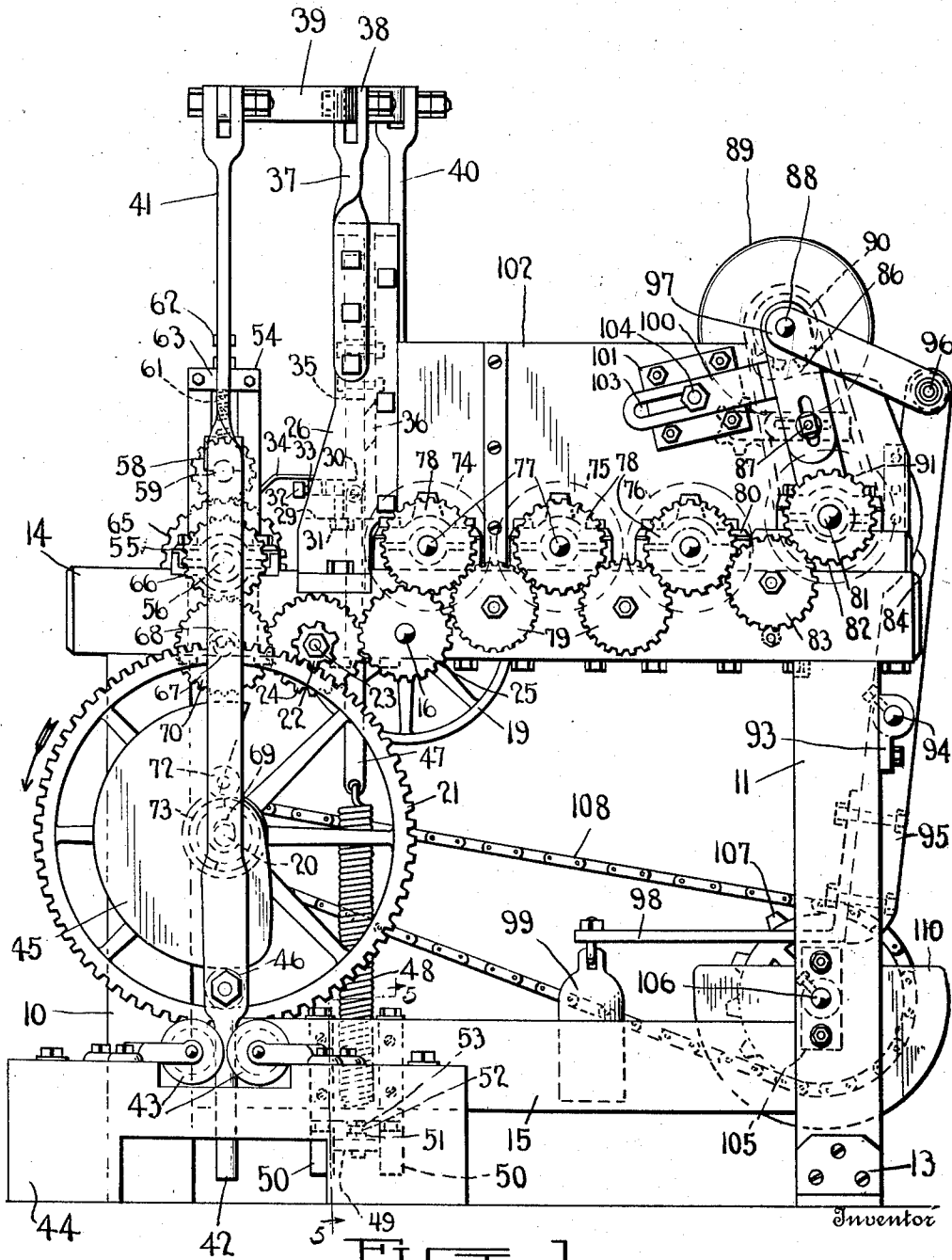


J. COCHRAN.
BAT CUTTING AND ROLLING MACHINE.
APPLICATION FILED JULY 7, 1910.

1,007,921.

Patented Nov. 7, 1911.

5 SHEETS-SHEET 1.



Witnesses

L. B. James
L. N. Willis

James Cochran

By

[Signature]

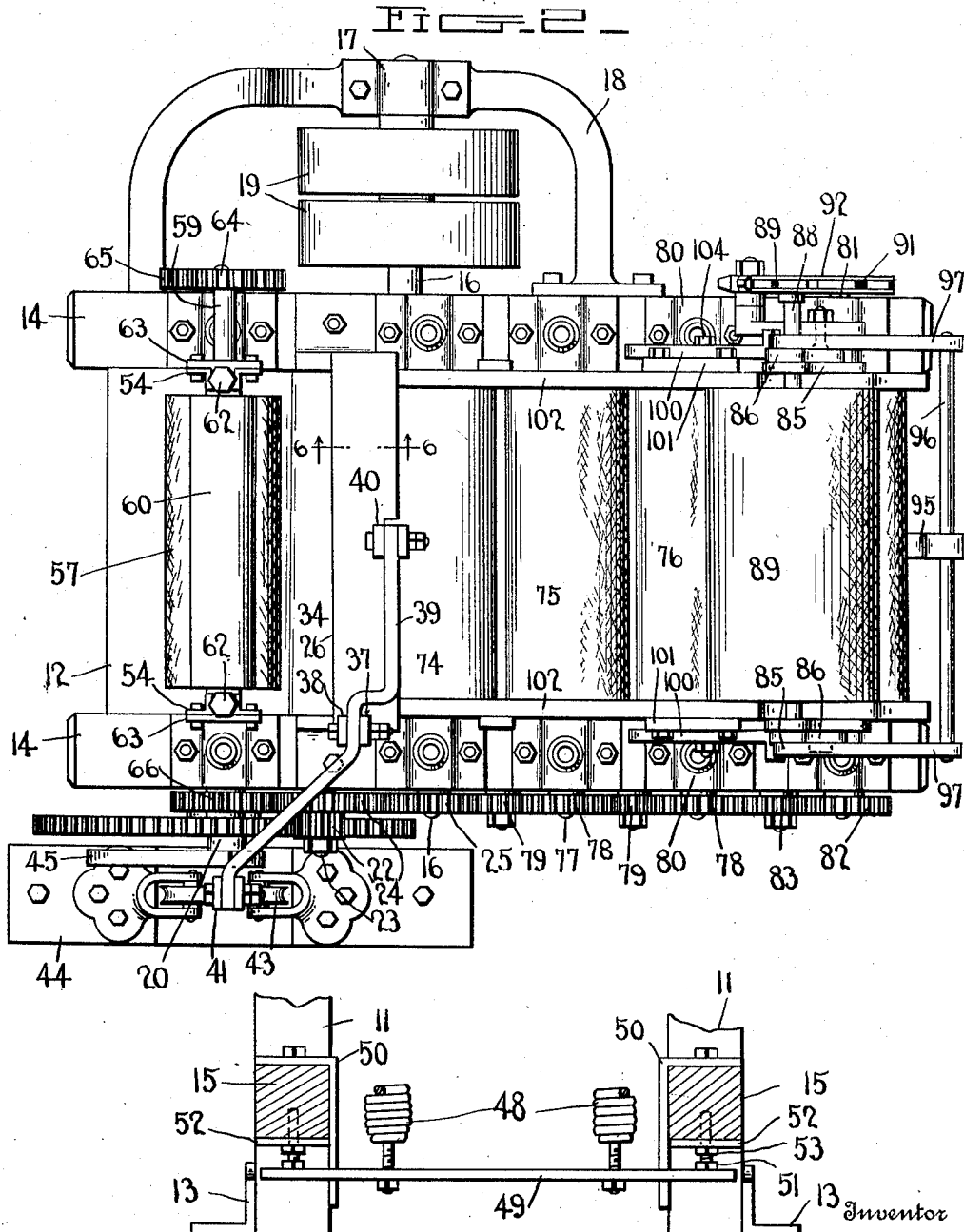
Attorney

J. COCHRAN.
BAT CUTTING AND ROLLING MACHINE.
APPLICATION FILED JULY 7, 1910.

1,007,921.

Patented Nov. 7, 1911.

5 SHEETS--SHEET 2.



Witnesses

L. B. James
L. N. Gillis

Fig. 5

James Cochran

By *Charles Charles*

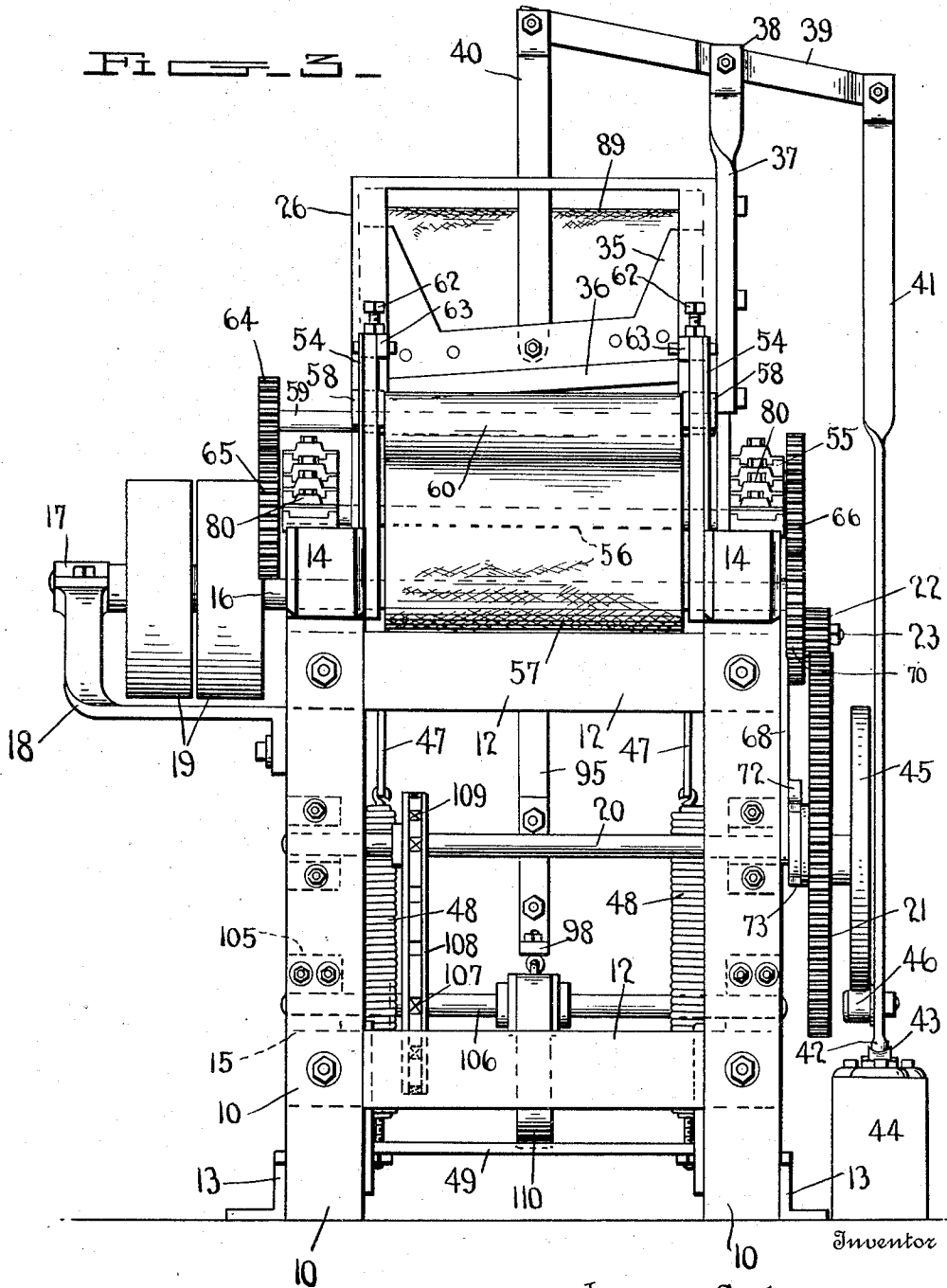
Attorneys

J. COCHRAN.
BAT CUTTING AND ROLLING MACHINE.
APPLICATION FILED JULY 7, 1910.

1,007,921.

Patented Nov. 7, 1911.

5 SHEETS—SHEET 3.



Witnesses

L. B. James
L. N. Gillis

James Cochran

By *Charles Chandler*

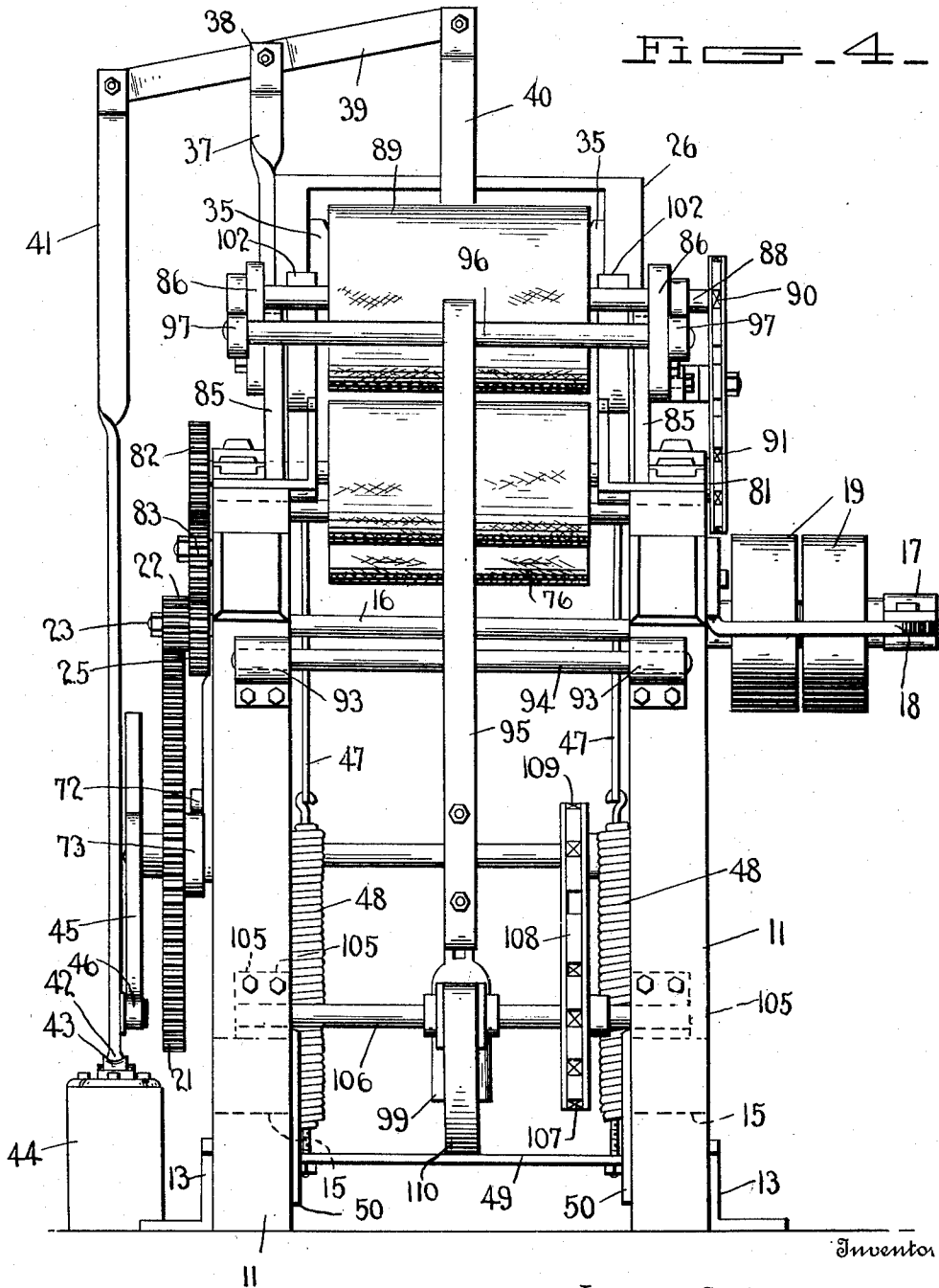
Attorneys

J. COCHRAN.
BAT CUTTING AND ROLLING MACHINE.
APPLICATION FILED JULY 7, 1910.

1,007,921.

Patented Nov. 7, 1911.

5 SHEETS-SHEET 4.



Inventor

James Cochran

Witnesses

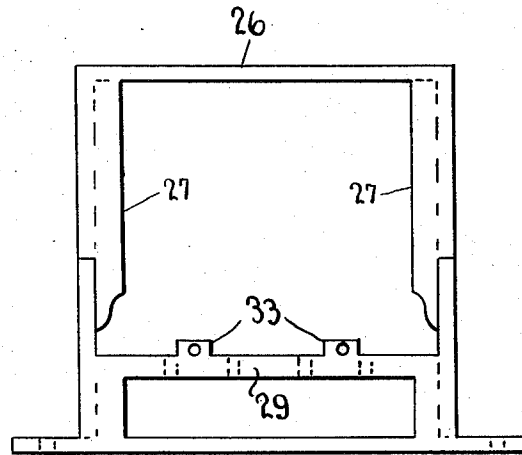
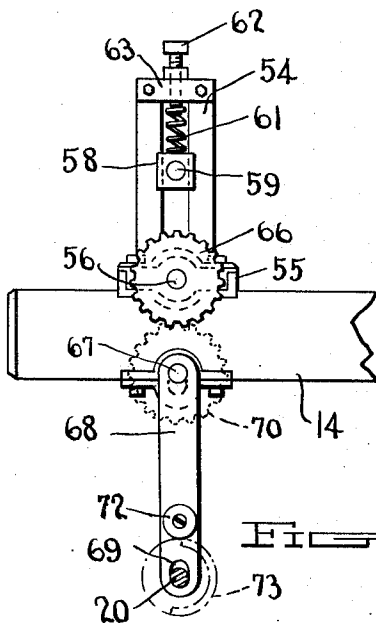
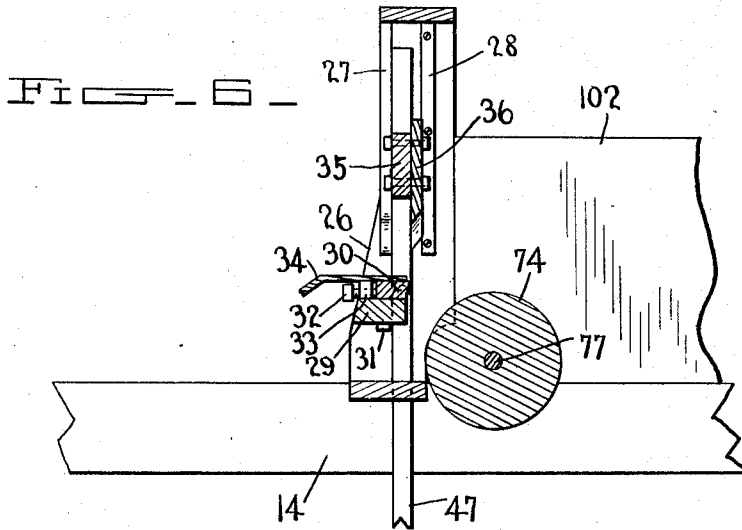
L. B. James
L. N. Lullie

By *Donald D. Dandy*
Attorneys

J. COCHRAN.
BAT CUTTING AND ROLLING MACHINE.
APPLICATION FILED JULY 7, 1910.

1,007,921.

Patented Nov. 7, 1911.
5 SHEETS—SHEET 5.



Witnesses

L. B. James
L. N. Willis

James Cochran

By *James Cochran*

Inventor

Attorneys

UNITED STATES PATENT OFFICE.

JAMES COCHRAN, OF LOCKPORT, NEW YORK, ASSIGNOR TO THE NIAGARA COTTON & BATTING COMPANY, OF LOCKPORT, NEW YORK.

BAT CUTTING AND ROLLING MACHINE.

1,007,921.

Specification of Letters Patent.

Patented Nov. 7, 1911.

Application filed July 7, 1910. Serial No. 570,796.

To all whom it may concern:

Be it known that I, JAMES COCHRAN, a citizen of the United States, residing at Lockport, in the county of Niagara, State of New York, have invented certain new and useful Improvements in Bat Cutting and Rolling Machines; 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.

This invention relates to devices for rolling up bats of the material commonly known as cotton batting and cutting off definite lengths of the material. In the manufacture of such devices as bed comforts and other articles of the like character the operation of preparing the lining of such comforts is attended with considerable annoyance due to the fact that the rolls of batting have to be cut or pierced in order that they shall be of the right lengths.

One object of the present invention is to provide a machine which will roll up lengths of batting and cut the same squarely so that each roll will have precisely the same length of batting contained therein or will consist of a plurality of lengths each of which equals the other lengths in said roll. In cutting a soft and very pliable material such as cotton batting much difficulty is experienced owing to the tendency of the batting to jam between the shear blades unless the ends be properly tensioned and the blades be held so that their edges will move in very close relation to each other.

A second object of the present invention is to provide an improved means for tensioning the bat during the cutting operation. In a machine of this description it is necessary to have some form of feeding device and it is essential that the feeding device feed the material to the shears so that the operation may be continuously carried on. With a light material like batting there is a marked tendency for the material to stick to the shears and thus clog the space between the feeder and shears by refusing to slip through when the shears are open.

A third object of the present invention is the provision of novel means whereby the feeding mechanism ceases to feed during the effective or cutting operation of the shears.

A fourth object of the present invention

is the provision of means whereby the cessation of movement of said feeding mechanism will operate to tension the bat between the shears so that it may be readily sheared. In the formation of rolls of batting it is not desirable that the batting be heavily compressed as when this is done it loses its fluffy and elastic nature and its heat insulating qualities are thereby destroyed.

A fifth object of the invention is the provision of a novel mechanism for forming a roll which is so arranged that after the roll has reached a certain size the roll being formed will be released from other pressure except that due to the weight of the material.

With the above and other objects in view, as will be hereinafter apparent, the invention consists in general of a machine embodying a feeder, a shear and a roll forming device, the several features and the entire mechanism being all of novel form and construction and actuated by improved operating mechanism.

The invention further consists in certain novel details of construction and combinations of parts hereinafter fully described, illustrated in the accompanying drawings, and specifically set forth in the claims.

In the accompanying drawings, like characters of reference indicate like parts in the several views, and:—Figure 1 is a side elevation of a machine constructed in accordance with this invention. Fig. 2 is a plan view of such a machine. Fig. 3 is an elevation of the front or receiving end of the machine. Fig. 4 is an elevation of the rear or delivery end of the machine. Fig. 5 is a cross sectional view on the line 5—5 of Fig. 1. Fig. 6 is a sectional view of the shearing mechanism, the view being taken on the line 6—6 of Fig. 2. Fig. 7 is a detail view showing certain mechanism at the end of the machine adjacent the knife. Fig. 8 is a detail view of a gallows frame used in connection with the cut-off mechanism.

The main frame of the invention includes upright members 10 and 11. The members 10 are preferably termed the front uprights and the members 11 the rear uprights. The front uprights 10 are connected by suitable transverse members 12 while the rear uprights are provided with brackets 13 to secure them to a floor or other foundation.

Connecting the upper ends of the members 10 and 11 on each side of the machine is an upper longitudinal frame member 14 and running between the same uprights adjacent their lower ends is a longitudinal frame member 15. The members 14 are provided with suitable bearings for the reception of a transverse main shaft 16 and in alinement with these bearings is a bearing 17 carried on a bracket 18 secured to the main frame, said bearing 17 forming the out-bored bearing of the shaft 16. Between the main frame and the out-bored bearing 17 are the fast and loose pulleys 19 which receive the driving belt of the machine. The uprights 10 have secured thereto certain bearings which support a shaft 20 preferably termed the cam shaft. On this cam shaft is a large gear 21 which meshes with a pinion 22 carried on an idler shaft 23. On this idler shaft is also fixed a gear 24 which meshes with a gear 25 carried on the shaft 16. By means of this gear train just described the rotation of the shaft 16 will cause the gear 21 to rotate.

As will appear from what is hereinafter set forth the lengths of the bats are determined by the rotation of the gear 21, the arrangement being such that with every rotation of said gear 21 the shear is actuated to cut the bats off. Now, by a proper adjustment of this portion of the device by means of different sized gears the lengths desired to be cut off may be regulated.

It is to be particularly noted that the term "bat" as used throughout the specification and claims is not to be limited to the folded stock but may also include single sheets of cotton such as are commonly termed "mattress stock."

Located on the members 14 and projecting up therefrom is a gallows frame 26 having suitable guides 27 secured to the inner faces of the upright portions and these guides may be adjusted to or from each other by suitable means, the preferred means being a tapered gib 28, the construction being best shown in Fig. 6. Extending across between the members 14 and located between the lower ends of the upright members of the gallows frame is a stationary knife support 29 whereon rests the lower or stationary knife 30. This knife is held securely to the support 29 by means of bolts 31 and may be adjusted to proper position on said support by bolts 32 passing through suitable lugs 33. Extending over the stationary knife and the bolt heads is an apron 34 the purpose of which will be hereinafter explained.

Sliding between the guides 27 is a movable knife support 35 whereon is secured a blade 36. By means of the gibs 28 and bolts 32 the edges of the two knives forming the shear may be kept in proper relation so

that they just graze each other, thus preventing the material being drawn between the sides of the knives and insuring the proper shearing. To this end also the movable knife 36 of the shear is set at an angle as can clearly be seen by reference to Fig. 3.

Extending upward from one side of the gallows frame 26 is a bracket 37 having a forked upper end 38 wherein is pivoted a bent lever 39. Connecting one end of this lever with the frame 35 is a link 40. The other end of the lever 39 lies vertically over the shaft 20 and projects slightly beyond said shaft. Depending from this end of the lever is a link 41 which has a rounded lower end 42 and this lower end moves between roller guides 43 supported on a suitable base block 44 secured near the end of the machine. By this means the link 41 is properly guided. Secured to the shaft 20 is a cam 45 and on the link 41 is a roller pin 46 which engages the edge of the cam 45. This cam is so arranged that once during each revolution the roller pin 46 will be allowed to move suddenly upward, thus permitting the dropping of the frame 35 carrying the upper member of the shear. To aid in pulling down the frame 35 the lower end of said frame is provided at each end with a link 47 and to the lower end of each of these links is connected the upper end of a spring 48, the respective lower ends of said springs being connected to a cross bar 49, the ends of which move between suitable guides 50 secured to the frame. This cross bar 49 may be depressed to increase the tension of the springs 48 by means of bolts 51 which pass through plates 52 having threaded apertures therein, the heads of these bolts resting on top of the cross bar 49. These bolts 51 are also provided with suitable lock nuts 53 to prevent accidental derangement of the spring tension. By means of this arrangement when the roller 46 is allowed to move upward the springs 48 draw the knife 36 quickly down and insure the cutting of the material. It is further to be noted that by varying the tension of these springs the shear may be adapted for cutting different weights or thicknesses of the material.

Extending upward from the members 14 adjacent their forward ends are bearing guides 54, these guides being positioned inside of the members 14. On the members 14 opposite these guides are bearings 55 wherethrough passes a shaft 56 which is provided with a feed roller or drum 57. Slidable in the guides 54 are bearings 58 supporting a shaft 59 fixed to which is a feed roller 60. The bearings 58 are normally pressed downward by means of springs 61 the pressure of which is regulated by tension bolts 62 passing through threaded plates 63 at the upper ends of said guides. By means of this arrangement the

proper tension may be maintained between the rollers 57 and 60. Furthermore, the shafts 56 and 59 are provided at one end with meshing gears 64 and 65, the gears 5 having long teeth so that the separation of the rollers due to material passing between may not cause the gears to unmesh. The shaft 56 is also provided with a gear 66 on the end opposite the gear 64. In the preferred construction the roller 60 is of considerably less diameter than the roller 57 and in order to make these two rollers move at the same peripheral speed the gears 64 and 65 have the same tooth ratio as the diameters of the respective rollers. In order to properly feed the material the roll 57 is covered with cloth, heavy cotton cloth such as light duck being preferably used for this covering.

At 67 is a shaft which lies directly beneath the shaft 56. The end of the shaft 67 adjacent the gear 64 is loosely fitted in a vertical slot in a suitable bearing so that it may move slightly to permit the other end of the shaft raising and lowering. The other end of this shaft 67 passes through and is journaled in a lift link 68 the lower end of which is slotted as at 69 to receive the shaft 20. On this shaft 67 is a gear 70 which meshes with the gear 24 and with a gear 66 carried on the shaft 56. On the lift link 68 is a roller 72 which normally rests on a cam 73 fixed upon the shaft 20. This cam is so arranged that during a portion of its revolution the lift link is raised and the shaft 67 moved up so that the gear 70 is held in mesh with the gear 66 while during the remainder of its revolution the shaft is moved down and the gear 70 allowed to drop out of mesh with the gear 66, thus stopping the motion of the rollers 57 and 60, which constitute the feeder for the machine.

It is to be noted that the arrangement of the cams 73 and 45 is such that at the time when the feeder stops moving the shear will operate while during the time that the shear is idle the feeder is in operation. The purpose of this will be understood when it is considered that the soft and fluffy material of which the bat is composed will pile up against the side of the knife blade as the feeder is allowed to operate at the time when the blade is down. The stopping of this feeder has also another purpose in connection with tensioning the material beneath the knife during the shearing operation. This purpose will be best understood from what follows hereafter.

In order to convey the material away from the shear it is preferred to use a conveyor composed of a plurality of rolls although some other form may be found equally adapted for the purpose. In the present instance there is here shown a con-

veyer composed of spaced rolls 74, 75 and 76. These rolls are all carried on similar shafts 77 mounted in suitable bearings on the members 14 and each of these shafts has fixed thereto a gear 78. The gear 78 of the roll 74 meshes with the gear 25 and between the adjacent rolls 74 and 75, and 75 and 76, are idler gears 79 which mesh respectively with the gears of the rollers above noted. Carried in suitable bearings 80 on the members 14 is a shaft 81 whereon is a gear 82 which is connected to the gear of the roller 76 by an idler gear 83. On this shaft 81 is a roller 84 which is so arranged that it projects well above the roller 76. Pivoted to the shaft 81 are arms 85 and to the free ends of these arms are secured extension arms 86 which are connected to the respective arms 85 by a bolt and slot connection indicated at 87. By this means the arms 86 may be adjusted relative to the arms 85. Journaled in the free ends of the arms 86 is a shaft 88 whereon is mounted a roller 89. On the shaft 88 is also a sprocket 90 and on the shaft 81 is a similar sprocket 91, the two being connected by a sprocket chain 92. By means of this arrangement it will be noted that all of the rolls 74, 75, 76, 84 and 89 revolve in the same direction. It is also to be noted that the adjustment of the arms permits the adjustment of the roller 89 to or from the roll 84. The roll 84 is preferably termed the lifting roll and the roll 89 the returning roll. The roll 89 is so connected by the sprockets and chain that this roll has a higher peripheral velocity than any of the other rolls.

Journaled to bearings 93 secured to the rear of the members 11 is a shaft 94 whereon is supported a lever 95 which has its upper end connected to a shaft 96, the ends of which carry links 97, the other ends of said links being connected to the shaft 88. Extending forward from the lower end of the lever 95 is a bracket 98 from the forward end of which depends a weight 99, the arrangement being such that the roll 89 normally projects over the roll 76 and lies closer to the front of the machine than the roll 84. In order to limit the movement of this roll 89 in a forward direction a suitable stop is provided. This stop is indicated at 100 and moves between guides 101 which are secured to side boards 102 projecting upward from the members 14, there being two of these stops, one lying in the path of each of the arms 86. These stops are slotted as at 103 and bolts 104 serve to hold them in adjusted position. Journaled to suitable bearings 105 carried on the members 11 is a shaft 106 whereon is a sprocket wheel 107 which is connected by means of a chain 108 with a sprocket wheel 109 fixed to the shaft 20. On this shaft 106 is a cam 110 which is so arranged as to engage against the

member 95 and push that member forward, thus drawing the roller 89 away from over the roller 76, the cam being arranged to do this at a predetermined time as will be understood from the operation of the machine. The respective rollers 75, 76, 84 and 89 are all covered with the same material as is used to cover the roller 57.

In the operation of the device the material is started between the feed rollers 57 and 60 by hand and the belt thrown on the fast pulley. As previously noted the usual length of material in one roll is seven feet or any multiple thereof, although any other suitable length may be used by changing the gear ratio between the gears 21 and 25 as also noted above. As the material passes beneath the movable blade of the shear it runs over the rollers 74, 75 and 76 until it strikes the lifting roll 84. The frictional engagement of the end of the material with the lifting roll raises the end of this material up until it strikes the under portion of the returning roll 89. Now, as this roll is rotating in the same direction with the other rolls it will move this end of the material toward the front or feeding end of the machine. This end will then fall downward on top of the material which is moving toward the lifting roll 84 and as a result of this operation, will start to roll up. When sufficient of this material has been rolled up to start the center of the roll in a neat cylindrical form the high velocity of the roll 89 will carry this center out from against the roll 84 so that it will lie in the valley between the rolls 75 and 76. At this time the cam 110 comes into play and moves the roller 89 away from over the now rapidly forming roll of material. It is to be noted that where thin material of any sort is used such as a single bat it is not necessary to move the roller 89 and the sprocket chain 108 may be disconnected, but where heavier material is used the roller 89 would be in the way of the formation of the complete roll and is, therefore, arranged to be moved out of such position by said cam 110. Now, the friction of the covered surfaces of the rolls 75 and 76 will continue the rolling up of the roll of material without compressing the same to an undue degree. When the seven feet or other length for which the machine has been set, has passed beneath the movable blade of the shear the cams 45 and 73 come into action. The cam 73 is so positioned that at this time the feeder is disconnected from the driving gear. Meanwhile the rolls 75 and 76 continue to move. The material is thus held fixed between the feeder rolls and tensioned by the action of the rolls 75 and 76. At this particular time the cam 45 releases the pin roller 46 and the upper shear descends and severs the material. As previously noted the material is not mov-

ing at this time and there is no accumulation of material between the feeder and the shear. As the fresh length of material starts in, due to the shear being raised by its cam and the feeder again thrown into operation, the rolls 75 and 76 will complete the rolling of the material which may then be removed if a single length roll is desired to be formed. If, however, a roll of several lengths is desired to be formed the first roll is left in position. The end of the material will then engage between the roller 75 and the roll resting thereon and cling to the roll of material which has just been formed. The former operation will then be repeated with the exception of the fact that the lifting and returning rolls will not come into play, the material being rolled directly on the already formed bat roll. There has thus been provided a simple and efficient device of the kind described and for the purpose specified.

It is obvious that minor changes may be made in the form and construction of this invention without departing from the material principles thereof. It is not therefore desired to confine the invention to the exact form herein shown and described, but it is wished to include all such as properly come within the scope of the appended claims.

Having thus described the invention, what is claimed as new, is:—

1. In a machine of the class described, a feeder, a shaft extending below said feeder, one end of said shaft being loosely mounted, a vertically movable bearing for the other end of said shaft, a driving gear on said shaft adjacent the vertically movable bearing, a driven gear on said feeder, a shear, a cam shaft adjacent the first mentioned shaft, operative means for said shear, and cams on said cam shaft arranged for alternately raising said bearing and actuating said shear.

2. In a machine of the class described, a feeder, a driven gear actuating said feeder, a driving gear, a cam mechanism intermittently moving said driving gear into mesh with said driven gear, a shear, operating means for said shear arranged to actuate the shear while the said gears are out of mesh, a conveyer leading from said shear, and driving means arranged to operate said conveyer continuously.

3. In a machine of the class described, a feeder, a shaft extending below said feeder, one end of said shaft being loosely mounted, a vertically movable bearing for the other end of said shaft, a driving gear on said shaft adjacent the vertically movable bearing, a driven gear on said feeder, a shear, a cam shaft adjacent the first mentioned shaft, operative means for said shear, cams on said cam shaft arranged for alternately raising said bearing and actuating said shear, a con-

veyer leading from said shear, and driving means arranged to operate said conveyer continuously.

4. In a machine of the class described, a feeder, a drive shaft, an operative connection between said feeder and drive shaft, an intermittently operable throw off for said operative connection, a shear, operative mechanism for said shear arranged to actuate the shear when the throw off is in action, a roll forming mechanism positioned on the opposite side of said shear to said feeder, and driving means arranged to operate said roll forming mechanism continuously whereby a bat passing under said shear will be stretched during the intermission of the operation of the feeder.

5. In a machine of the class described, a feeder, a driven gear actuating said feeder, a driving gear, a cam mechanism intermittently moving said driving gear into mesh with said driven gear, a shear, operating means for said shear arranged to actuate the shear while the said gears are out of mesh, a roll forming mechanism positioned on the opposite side of said shear to said feeder, and driving means arranged to operate said roll forming mechanism continuously whereby a bat passing under said shear will be stretched during the intermission of the operation of the feeder.

6. In a machine of the class described, a feeder, a shaft extending below said feeder, one end of said shaft being loosely mounted, a vertically movable bearing for the other end of said shaft, a driving gear on said shaft adjacent the vertically movable bearing, a driven gear on said feeder, a shear, a cam shaft adjacent the first mentioned shaft, operative means for said shear, cams on said cam shaft arranged for alternately raising said bearing and actuating said shear, a roll forming mechanism positioned on the opposite side of said shear to said feeder, and driving means arranged to operate said roll forming mechanism continuously whereby a bat passing under said shear will be stretched during the intermission of the operation of the feeder.

7. In a machine of the class described, a roll forming mechanism comprising a conveyer, a roll having its upper portion projecting above said conveyer and located at the delivery end of said conveyer, a second roll located above the delivery end of the said conveyer and a jointed lever below the conveyer operating to intermittently move the second roll from over the conveyer.

8. In a machine of the class described, a roll forming mechanism comprising a conveyer, a roll having its upper portion projecting above said conveyer and located at the delivery end of said conveyer, a second roll located above the delivery end of the said conveyer, and a cam actuated jointed

mechanism to move the second roll from over the conveyer intermittently.

9. In a machine of the class described, a roll forming mechanism comprising a conveyer, a roll having its upper portion projecting above said conveyer and located at the delivery end of said conveyer, a second roll located above the delivery end of the said conveyer, means to move said second roll at a higher peripheral speed than and in the same direction as the conveyer and first roll, and other means to move the second roll from over the conveyer intermittently.

10. In a machine of the class described, a roll forming mechanism comprising a conveyer, a roll having its upper portion projecting above said conveyer and located at the delivery end of said conveyer, a second roll located above the delivery end of the said conveyer, a shear at the receiving end of said conveyer, actuating means to operate said conveyer and rolls continuously, intermittently operating mechanism for said shear, and means to hold a bat under tension during the effective operation of said shear.

11. In a machine of the class described, a roll forming mechanism comprising a conveyer, a roll having its upper portion projecting above said conveyer and located at the delivery end of said conveyer, a second roll located above the delivery end of the said conveyer, means to move said second roll at a higher peripheral speed than and in the same direction as the conveyer and first roll, a shear at the receiving end of said conveyer, actuating means to operate said conveyer and rolls continuously, intermittently operating mechanism for said shear, and means to hold a bat under tension during the effective operation of said shear.

12. In a machine of the class described, a roll forming mechanism comprising a conveyer, a roll having its upper portion projecting above said conveyer and located at the delivery end of said conveyer, a second roll located above the delivery end of the said conveyer, means to move the second roll from over the conveyer, a shear at the receiving end of said conveyer, actuating means to operate said conveyer and rolls continuously, intermittently operating mechanism for said shear, and means to hold a bat under tension during the effective operation of said shear.

13. In a machine of the class described, a roll forming mechanism comprising a conveyer, a roll having its upper portion projecting above said conveyer and located at the delivery end of said conveyer, a second roll located above the delivery end of the said conveyer, means to move said second roll at a higher peripheral speed than and in the same direction as the conveyer and

first roll, a shear at the receiving end of said conveyer, actuating means to operate said conveyer and rolls continuously, intermittently operating mechanism for said shear, and means to hold a bat under tension during the effective operation of said shear.

14. In a machine of the class described, a roll forming mechanism comprising a conveyer, a roll having its upper portion projecting above said conveyer and located at the delivery end of said conveyer, a second roll located above the delivery end of the said conveyer, actuating means for said conveyer arranged to operate the conveyer and rolls continuously, an intermittently operated shear, an intermittently operating feeder, and an operative connection between the actuating means and the shear and feeder, said connection being arranged to operate the shear and feeder alternately.

15. In a machine of the class described, a roll forming mechanism comprising a conveyer, a roll having its upper portion projecting above said conveyer and located at the delivery end of said conveyer, a second roll located above the delivery end of the said conveyer, means to move said second roll at a higher peripheral speed than and in the same direction as the conveyer and first roll, actuating means for said conveyer arranged to operate the conveyer and rolls continuously, an intermittently operated shear, an intermittently operating feeder, and an operative connection between the actuating means and the shear and feeder, said connection being arranged to operate the shear and feeder alternately.

16. In a machine of the class described, a roll forming mechanism comprising a conveyer, a roll having its upper portion projecting above said conveyer and located at the delivery end of said conveyer, a second roll located above the delivery end of the said conveyer, means to move said second roll from over the conveyer intermittently, actuating means for said conveyer arranged to operate the conveyer and rolls continuously, an intermittently operated shear, an intermittently operating feeder, and an operative connection between the actuating means and the shear and feeder, said connection being arranged to operate the shear and feeder alternately.

17. In a machine of the class described, a roll forming mechanism comprising a conveyer, a roll having its upper portion projecting above said conveyer and located at the delivery end of said conveyer, a second roll located above the delivery end of the said conveyer, means to move said second roll at a higher peripheral speed than and in the same direction as the conveyer and first roll, other means to move the second roll from over the conveyer intermittently, actuating means for said conveyer arranged

to operate the conveyer and rolls continuously, an intermittently operated shear, an intermittently operating feeder, and an operative connection between the actuating means and the shear and feeder, said connection being arranged to operate the shear and feeder alternately.

18. In a machine of the class described, a roll forming mechanism comprising a series of spaced rollers arranged side by side, a bat lifting roll having its upper portion projecting above the rolls of said series, and located at the delivery end of said series of rolls, a bat returning roll located above said lifting roll and projecting over the final roll of said series, operating means to rotate all of said rolls in the same direction, a cam actuated jointed lever below said spaced rollers, and an operative connection between said lever and bat returning roll for moving said returning roll from over said final roll intermittently.

19. In a machine of the class described, a roll forming mechanism comprising a series of spaced rollers arranged side by side, a bat lifting roll having its upper portion projecting above the rolls of said series and located at the delivery end of said series of rolls, a bat returning roll located above said lifting roll and projecting over the final roll of said series, operating means to rotate all of said rolls in the same direction, means to adjust said returning roll with respect to said lifting roll, and means to move the roll bodily from over the final roll of said series.

20. In a machine of the class described, a roll forming mechanism comprising a series of spaced rollers arranged side by side, a bat lifting roll having its upper portion projecting above the rolls of said series and located at the delivery end of said series of rolls, a bat returning roll located above said lifting roll and projecting over the final roll of said series, operating means to rotate all of said rolls in the same direction, said operating means being arranged to move the bat returning roll at a higher peripheral speed than the remaining rolls, means to adjust said returning roll to and from said lifting roll, and means to move the returning roll bodily from over the final roll of said series.

21. In a machine of the class described, a roll forming mechanism comprising a series of spaced rollers arranged side by side, a bat lifting roll having its upper portion projecting above the rolls of said series and being located at the delivery end of said series of rolls, a bat returning roll located above said lifting roll and projecting over the final roll of said series, operating means to rotate all of said rolls in the same direction, adjusting means to adjust said returning roll to and from said lifting roll, and other means to move the returning roll bodily from over the final roll of said series,

shear at the initial end of said series of rolls, intermittently operating mechanism for said shear, and means to hold a bat under tension during the effective operation of said
5 shear.

22. In a machine of the class described, a roll forming mechanism comprising a series of spaced rollers arranged side by side, a bat
10 lifting roll having its upper portion projecting above the rolls of said series and located at the delivery end of said series of rolls, a bat returning roll located above said lifting roll and projecting over the final roll of said series, operating means to rotate all of said
15 rolls in the same direction, said operating means being arranged to move the bat returning roll at a higher peripheral speed than the remaining rolls, adjusting means to

adjust said returning roll to and from said lifting roll, other means to move the return- 20 ing roll bodily from over the final roll of said series, a shear at the receiving end of said series of rolls, intermittently operating means for said shear, an intermittently operating feeder, and an operative connection be- 25 tween the roll operating means, the shear operating means and the feeder, said connection being arranged to operate the shear and feeder alternately during the continuous operation of said rolls. 30

In testimony whereof, I affix my signature, in presence of two witnesses.

JAMES COCHRAN.

Witnesses:

L. N. GILLIS,

A. H. EMMERT.

Copies of this patent may be obtained for five cents each, by addressing the "Commissioner of Patents, Washington, D. C."