No. 666,973.

Patented Jan. 29, 1901.

W. H. PALMER, JR.

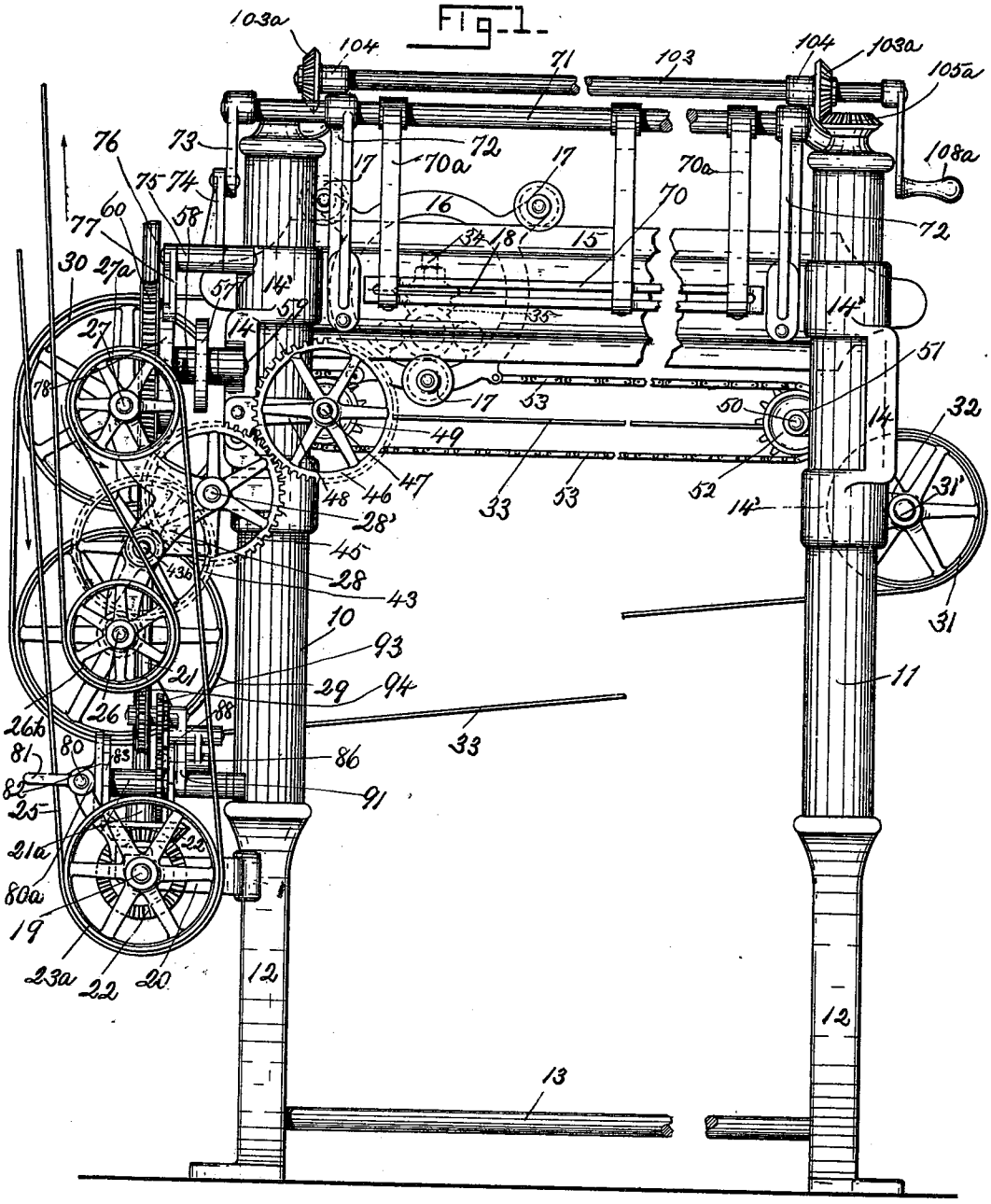
CLOTH CUTTING MACHINE.

(No Model.)

(Application filed Dec. 31, 1897. Renewed Dec. 29, 1900.)

7 Sheets—Sheet 1.

Fig. 1.



Witnesses

Clarence M. Luther.

May F. Ritchie.

Inventor

William H. Palmer Jr,

By Attorney

Frank H. Allen

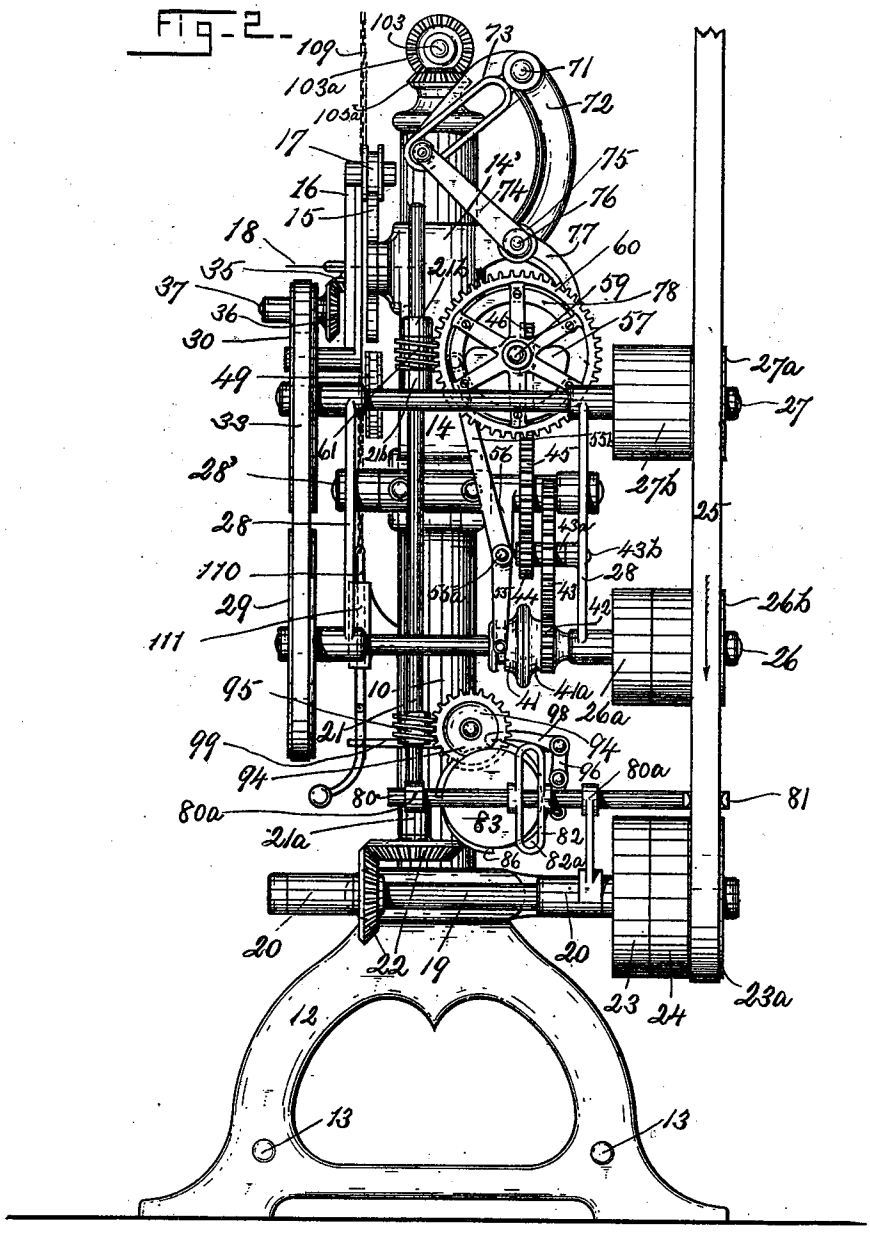
No. 666,973. Patented Jan. 29, 1901.

W. H. PALMER, JR.

CLOTH CUTTING MACHINE.

(No Model.) Application filed Dec. 31, 1897. Renewed Dec. 29, 1900.) 7 Sheets—Sheet 2.

Fig. 2.



Witnesses
Howard R. Luther.
May F. Ritchie

Inventor
William H. Palmer Jr.,
By Attorney
Frank H. Allen.

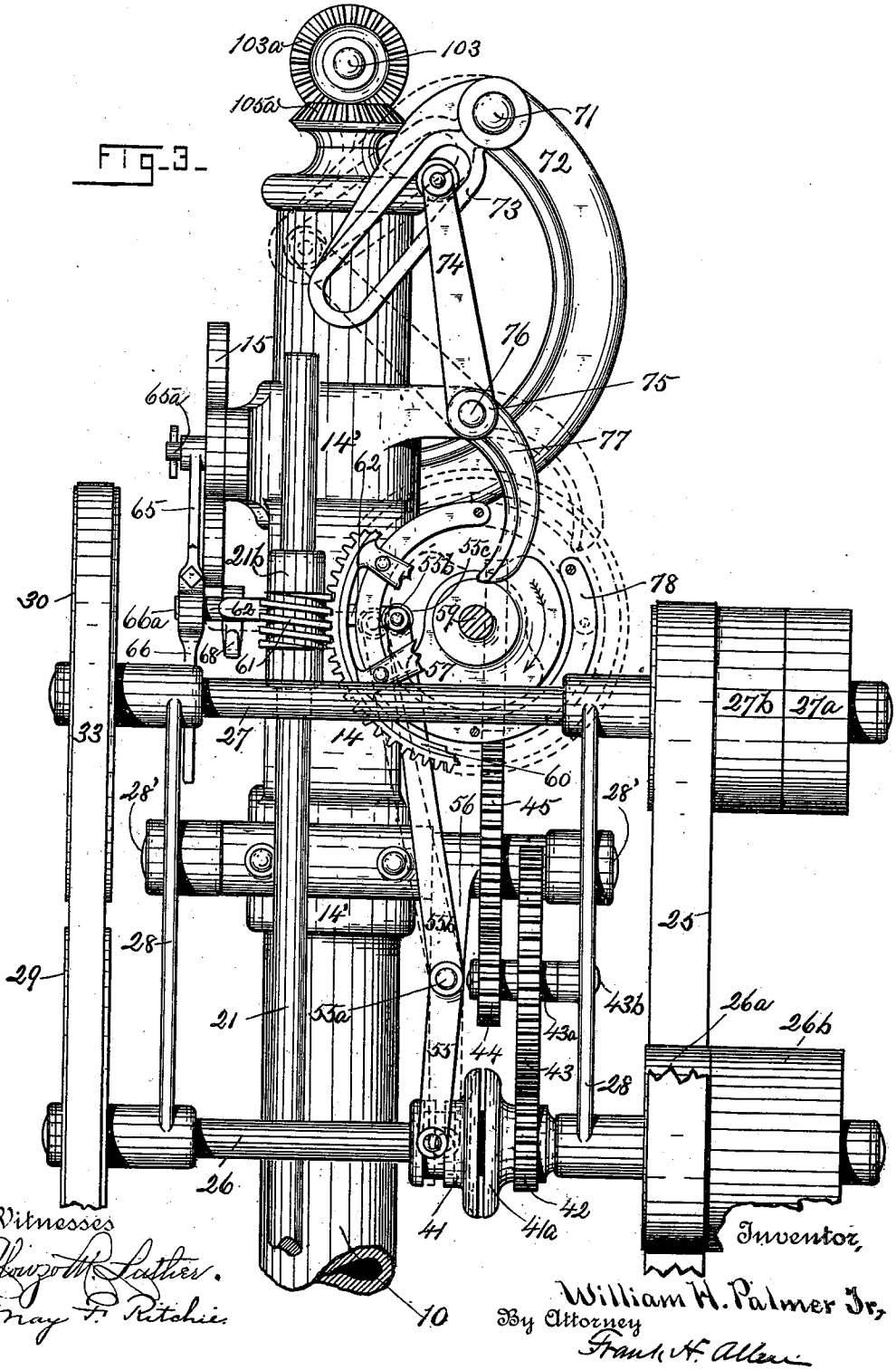
No. 666,973. Patented Jan. 29, 1901.

W. H. PALMER, JR.

CLOTH CUTTING MACHINE.

(No Model.) (Application filed Dec. 31, 1897. Renewed Dec. 29, 1900.) 7 Sheets—Sheet 3

Fig. 3.



Witnesses
Harry W. Leather.
May F. Ritchie.

Inventor,
William H. Palmer Jr.
By Attorney
Frank H. Allen

No. 666,973.

Patented Jan. 29, 1901.

W. H. PALMER, JR.

CLOTH CUTTING MACHINE.

(No Model.) (Application filed Dec. 31, 1897. Renewed Dec. 29, 1900.) 7 Sheets—Sheet 4.

Fig. 4.

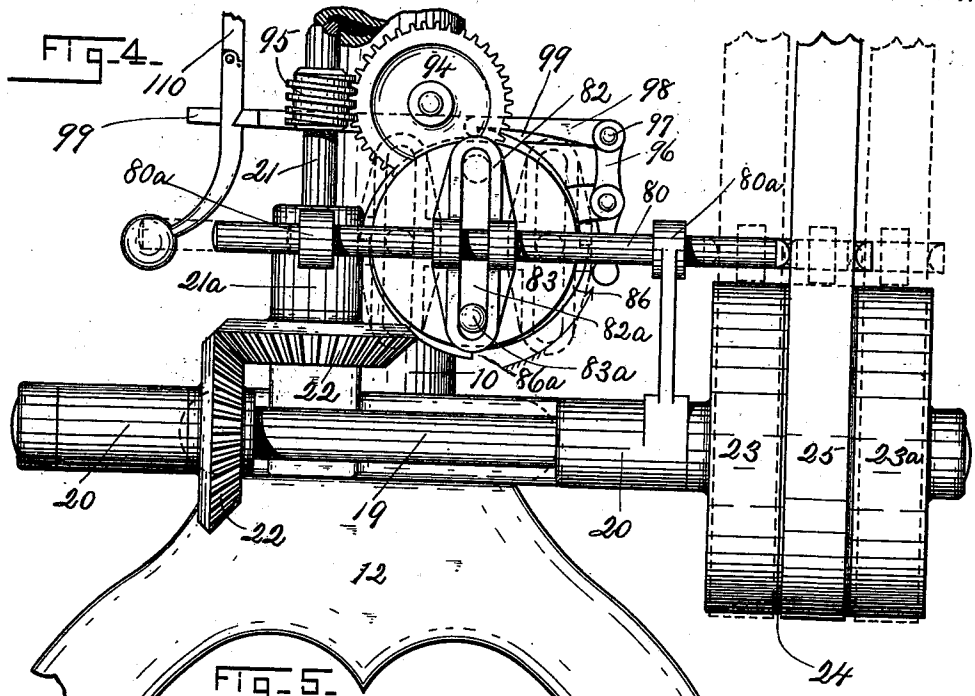
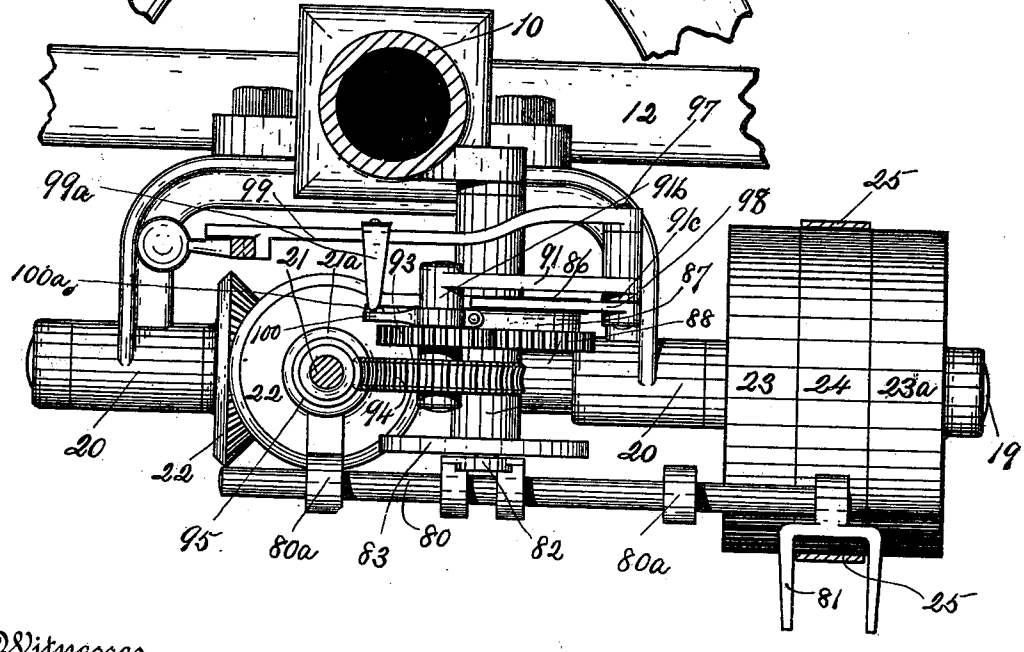


Fig. 5.



Witnesses

Alonzo M. Luther.

May F. Ritchie.

Inventor

William H. Palmer Jr.,

By Attorney

Frank H. Allen

No. 666,973. Patented Jan. 29, 1901.

W. H. PALMER, JR.

CLOTH CUTTING MACHINE.

(No Model.) (Application filed Dec. 31, 1897. Renewed Dec. 29, 1900.) 7 Sheets—Sheet 5.

Fig. 6.

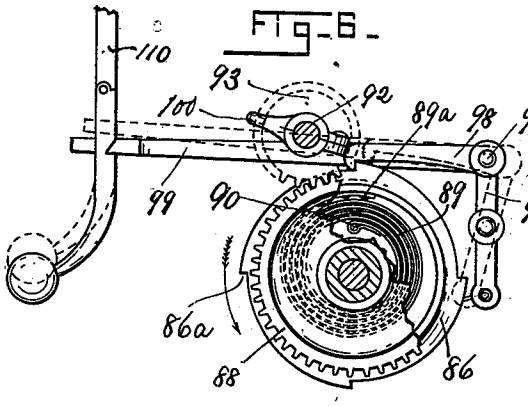


Fig. 7.

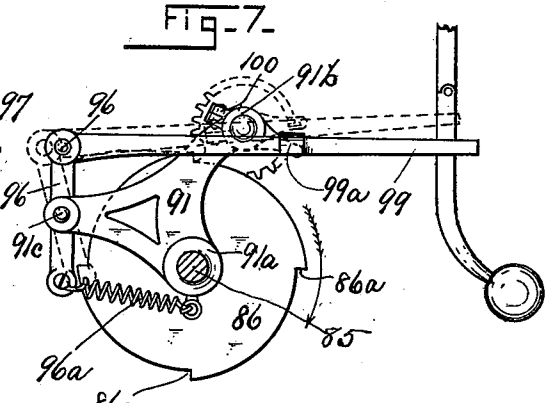


Fig. 8.

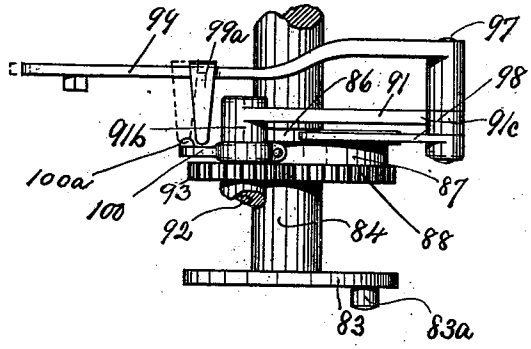


Fig. 9.

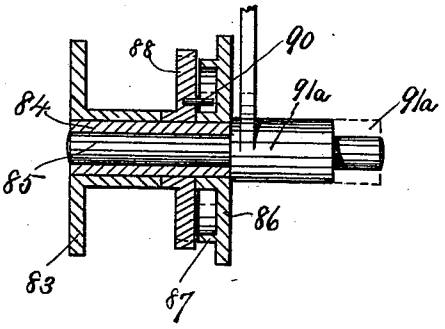


Fig. 10.

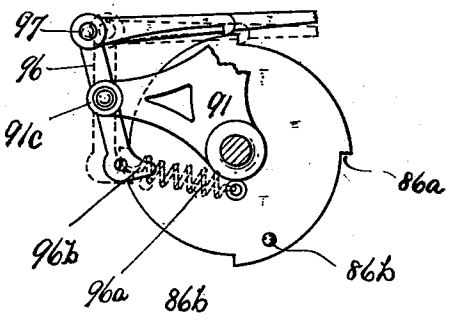
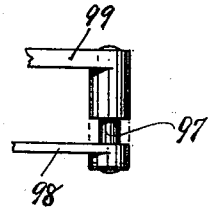


Fig. 11.



Witnesses
Clayton R. Luther.
May F. Ritchie

Inventor
William H. Palmer Jr,
By Attorney
Frank H. Allen.

No. 666,973. Patented Jan. 29, 1901.

W. H. PALMER, JR.

CLOTH CUTTING MACHINE.

(No Model.) (Application filed Dec. 31, 1897. Renewed Dec. 29, 1900.)

7 Sheets—Sheet 6.

Fig. 12.

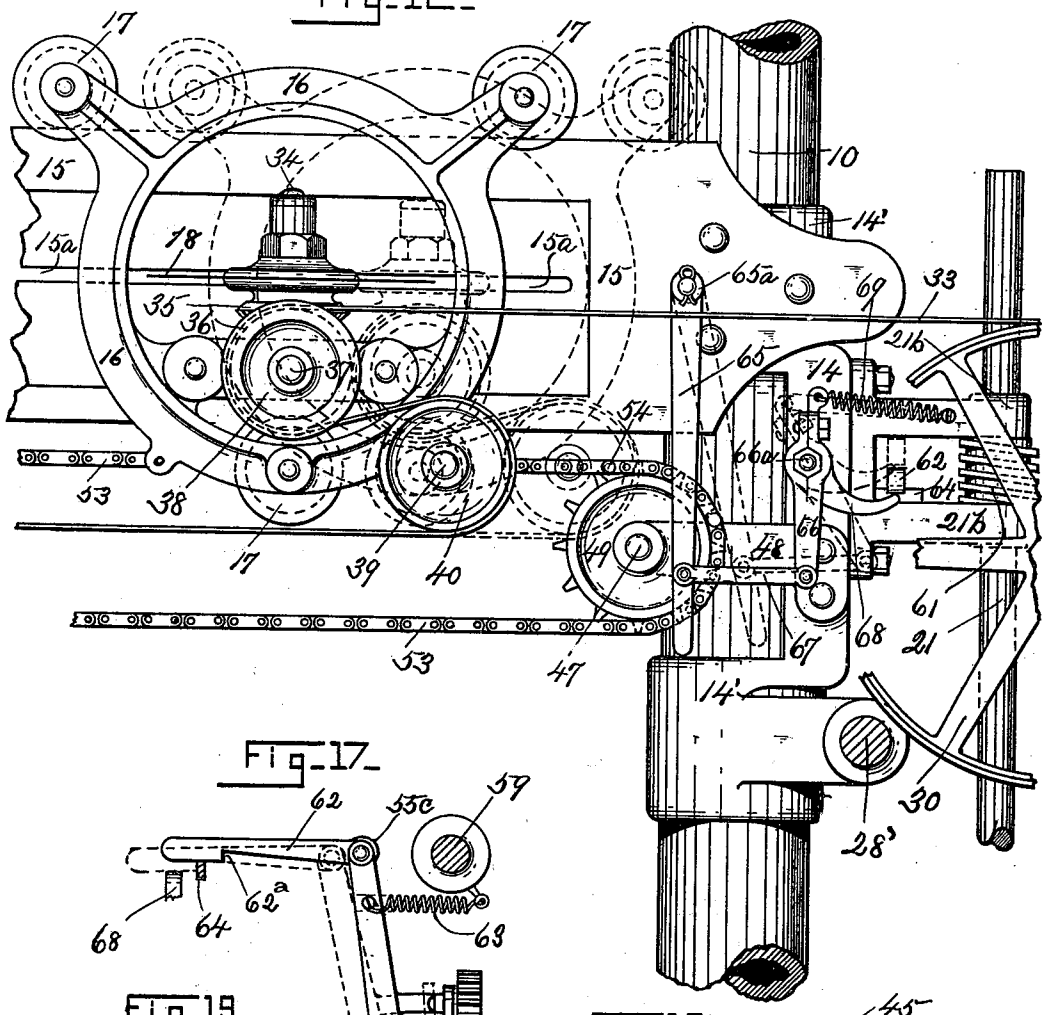


Fig. 17.

Fig. 19.

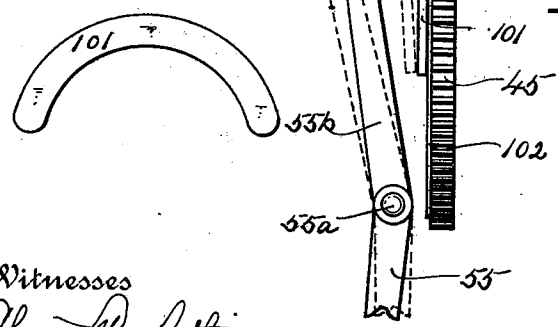
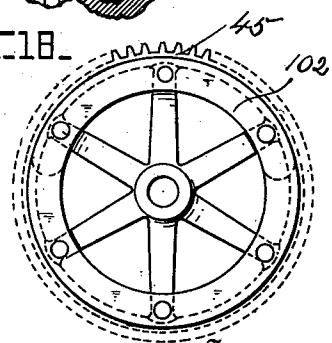


Fig. 18.



Witnesses
Alonzo M. Luther.
May F. Ritchie

Inventor
William H. Palmer Jr.,
By Attorney
Frank H. Allen

No. 666,973. Patented Jan. 29, 1901.

W. H. PALMER, JR.

CLOTH CUTTING MACHINE.

(No Model.) (Application filed Dec. 31, 1897. Renewed Dec. 29, 1900.) 7 Sheets—Sheet 7.

Fig. 15.

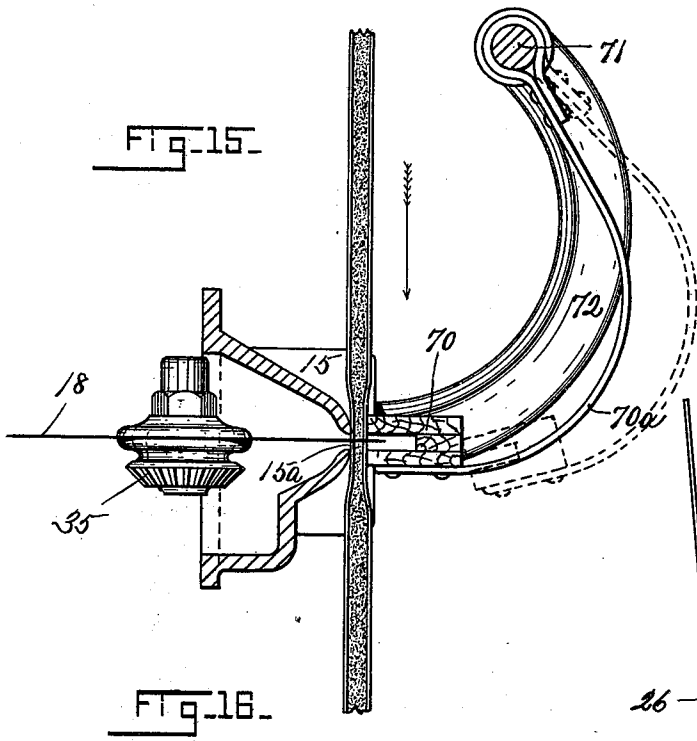


Fig. 14.

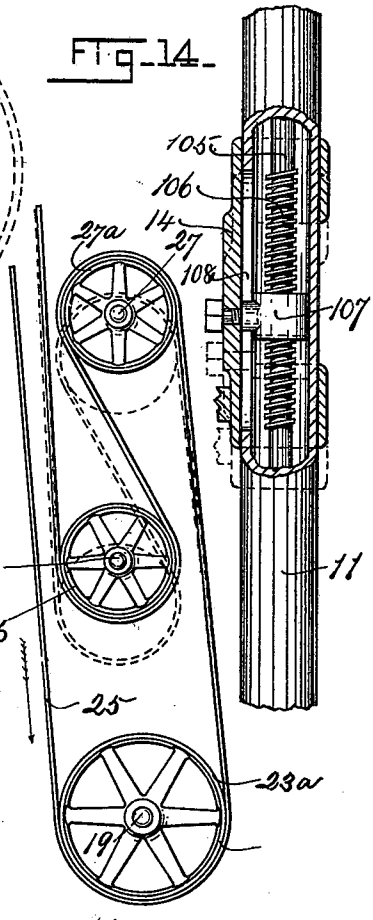


Fig. 16.

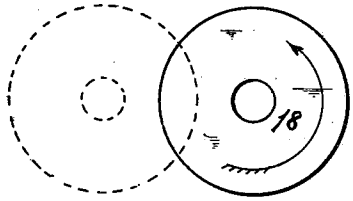
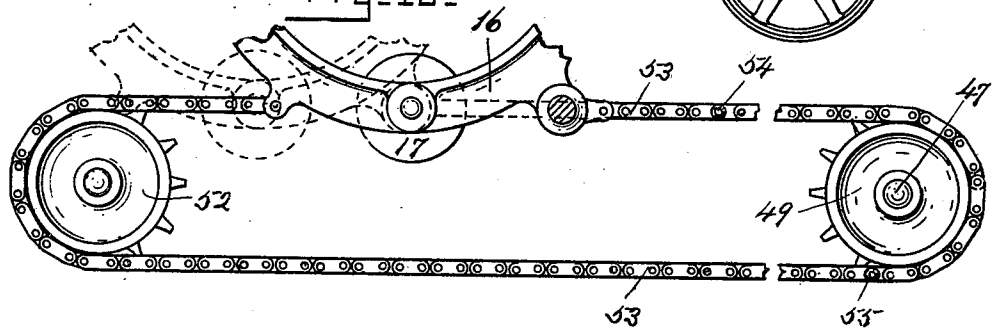


Fig. 13.



Witnesses

Thomas A. Luther.

Mary F. Ritchie

Inventor

William H. Palmer Jr,

By Attorney

Frank A. Allen

UNITED STATES PATENT OFFICE.

WILLIAM H. PALMER, JR., OF NORWICH, CONNECTICUT.

CLOTH-CUTTING MACHINE.

SPECIFICATION forming part of Letters Patent No. 666,973, dated January 29, 1901.

Application filed December 31, 1897. Renewed December 29, 1900. Serial No. 41,495. (No model.)

To all whom it may concern:

Be it known that I, WILLIAM H. PALMER, Jr., a citizen of the United States, residing at Norwich, in the county of New London and State of Connecticut, have invented certain new and useful Improvements in Machines for Measuring and Cutting Compound Fabric, which improvements are fully set forth and described in the following specification, reference being had to the accompanying seven sheets of drawings.

The machine forming the subject of this invention is designed especially for use in the manufacture of bed-comfortables, although it may be used with advantage in cutting up single fabrics into desired lengths. The particular office of my said machine is, however, to automatically "cut up" the compound fabric from which the quilts are produced into proper lengths. This compound fabric consists, briefly described, of two outer or face fabrics and an interposed filling of cotton or like material, the whole being "quilted" or "tied" previously to being cut into lengths for comfortables. Said compound fabric is usually manufactured in a continuous web and is tied in some instances by a knotting-machine, and from said knotter the web of compound fabric is fed to my improved "cutting-off" machine, which automatically cuts the knotted compound fabric into given lengths. Later the cut ends of the comfortables are properly finished, and they are then ready for the market.

My improved machine, briefly described, consists of a framework supporting a track upon which is mounted to travel reciprocally a carriage carrying a circular knife. Said frame also supports suitable mechanism for driving and controlling the carriage and its knife and other mechanism incidental thereto, the particular office and operation of each of which elements are fully described hereinafter.

To assist in the explanation of my invention, the accompanying drawings have been provided, illustrating the same, to wit:

Figure 1 is a rear side elevation of my said machine. Fig. 2 is an end elevation thereof. Fig. 3 is an enlarged view of the upper portion of Fig. 2, illustrating particularly the carriage and knife driving and controlling mechanism. Fig. 4 is an enlarged view of the lower portion of Fig. 2, showing more clearly certain belt-shipping mechanism, Fig. 5 is a plan view of the elements of Fig. 4. Figs. 6, 7, 8, 9, 10, and 11 illustrate in detail the construction and manner in which said belt-shipping mechanism operates. Fig. 12 is an elevation of a portion of the front side of my machine, illustrating particularly the carriage and its knife and certain elements of the carriage-controlling mechanism. Fig. 13 illustrates also a portion of said carriage-controlling mechanism. Fig. 14 shows a certain adjustment provided in connection with the frame of my machine and aids in explaining the manner in which it operates. Fig. 15 illustrates the means provided for clamping and cutting off the compound fabric. Fig. 16 is a plan view of the circular knife and shows the manner in which it travels. Figs. 17, 18, and 19 illustrate in detail a certain safety device provided in connection with the carriage and knife driving and controlling mechanism.

The end frames of my machine consist of vertical cylindrical posts or columns, (denoted, respectively, by reference-numbers 10 and 11,) said posts being mounted upon frames 12, forming supporting-feet therefor, which frames 12 are connected and supported in proper relation to each other near the floor by tie-rods 13. Posts 10 and 11 have each adjustably mounted thereon a frame 14, which frames serve to support several of the operative elements of my said machine. Frames 14 extend parallel to the posts 10 and 11, and each has formed at its ends cylindrical shells or straps 14′, that are in vertical alinement with each other and encircle the posts 10 and 11, thus securing said frames to the posts, but in no wise preventing their vertical adjustment thereon, which adjustment is accomplished by means of mechanism hereinafter described.

Reference-number 15 denotes a track or way which is bolted near each end to frames 14 and has mounted thereon the knife-carriage 16, which latter is caused to travel reciprocally along said track, a circular knife 18, mounted on said carriage, serving at each

trip along the track to sever the fabric which meanwhile is clamped against the rear side of said track, as hereinafter explained.

Reference-number 19 denotes the initial or driving shaft of my machine, the same being supported horizontally in bearings 20, fixedly secured to the foot-frame of post 10.

Reference-number 21 denotes a vertical shaft supported in bracket-bearings 21^a and 21^b, secured, respectively, to the foot-frame of post 10 and the frame 14 of said post, and number 22 indicates a pair of bevel-gears by means of which motion is communicated from shaft 19 to shaft 21, which latter shaft in turn drives various mechanisms of my machine.

It will be apparent that as carriage 16 must travel in both directions the driving mechanism for said carriage, as well as the knife, must be reversible, and the construction of this mechanism and the manner in which such reversing of the same is obtained I will now proceed to describe.

Mounted upon shaft 19 are two fast pulleys 23 23^a, and intermediate said pulleys is a loose pulley 24, all being adapted to receive and to be driven by the main belt 25, which belt also serves to impart motion to the carriage and knife mechanism. Belt 25 travels always in the same direction, and the driving of the carriage and knife operating mechanism in two directions is effected by providing two driving shafts 26 and 27, each provided with fast and loose pulleys, (denoted, respectively, by reference-numbers 26^a 26^b and 27^a 27^b,) all of said pulleys being so located that they travel in the same vertical plane as the pulleys 23 23^a and 24. Shafts 26 and 27 are parallel to each other and to the main shaft 19 and are supported in vertical alinement with each other by means of bearings in a pair of brackets 28, secured to frame 14 of post 10, or, rather, mounted upon a bar 28', secured to said frame. The belt 25, it is assumed, leads from the pulley of an overhead counter-shaft and travels in the direction indicated by the arrows. Said belt travels downward around the pulleys of shaft 19 and then over those of shaft 27, thence downward under those of shaft 26, and finally back to the counter-shaft pulley. It will now be readily understood that when belt 25 thus engages the pulleys of shafts 26 and 27 motion will be imparted to said pulleys in opposite directions; but in order that the shafts themselves may not be so simultaneously revolved I have located their fast pulleys out of alinement with each other, as shown in Fig. 2, from which it will be seen that fast pulley 26^a and loose pulley 27^b are in alinement with each other and with the fast pulley 23 of the shaft 19, that fast pulley 27^a and loose pulley 26^b are in alinement with each other and with fast pulley 23^a on shaft 19, and also that loose pulley 24 is in alinement with portions of the loose pulleys 26^b and 27^b. It will also be readily understood that when belt 25 engages pulleys 23, 26^a, and 27^b motion will be imparted thereby to shafts 19 and 26, that when it engages pulleys 23^a, 26^b, and 27^a motion will be imparted to shafts 19 and 27, and that when pulleys 24, 26^b, and 27^b are engaged no motion whatever will be imparted to the machine. It will also be apparent that when shafts 26 and 27 are in motion they revolve in opposite directions, and therefore may serve to correspondingly drive the carriage and knife driving mechanisms in opposite directions.

To accomplish the shifting of belt 25 to cause it to engage the sets of pulleys in the manner just described, I have provided a certain automatically-acting shifting mechanism, hereinafter described.

Mounted upon shaft 26 at the end thereof opposite its pulleys 26^a 26^b is a pulley 29, and similarly located on shaft 27 is a like pulley 30. At the opposite end of my machine is a pulley 31, loosely mounted on a stud 31', projecting from a bracket 32, secured to frame 14 of post 11. Pulleys 29, 30, and 31 are in the same vertical plane and support the knife-driving belt 33, one of the said pulleys (29 or 30) always serving as the driving-pulley thereof. The circular knife has already been referred to by reference-number 18. It is secured to a vertical shaft 34, suitably supported within the carriage 16, and also secured to said shaft is a bevel-gear 35, which meshes with a companion gear 36, mounted on a horizontal shaft 37, also supported in suitable bearings in the carriage 16. Fixedly secured on shaft 37 is a flanged pulley 38. Loosely mounted on a stud 39, projecting from the carriage 16, is a similar flanged pulley 40. The belt 33 engages pulleys 29, 30, 31, 38, and 40, as will be understood by reference to Fig. 12, from which it will be seen that when in motion the pulley 38 serves (with gears 35 and 36) to impart rotary motion to knife 18, and from the manner in which belt 33 engages the pulleys 38 and 40 it will be seen that the reciprocating travel of pulleys 38 and 40 with carriage 16 is provided for, said knife 18 being driven equally well whether carriage 16 be stationary or in motion, as shown in dotted lines, Fig. 12. The direction in which knife 18 is driven will of course depend upon whether the pulley 29 or 30 is acting as the driver of belt 33.

It will now be understood by reference to Figs. 2 and 3 that by means of belt 33 shafts 26 and 27 must always revolve in unison and in the same direction with each other. For example, when the driving-belt 25 is on the fast pulley 27^a of shaft 27 and serving to drive said shaft the latter being belted to shaft 26 is serving to correspondingly drive said shaft 26, and when belt 25 drives the fast pulley of shaft 26 the shaft 27 receives corresponding motion therefrom, in each instance the shaft driven by belt 33 revolving in the direction the reverse to that in which its loose pulley is being driven by belt 25.

The knife-carriage 16 is driven from the shaft 26 by means of the following-described

mechanism, reference being had to Figs. 1, 2, 3, 12, 13, and 17: Upon said shaft is located a friction-clutch whose fast and loose sections are denoted by reference-numbers 41 41ª, respectively. Mounted upon loose section 41ª is a pinion-gear 42, meshing with a large gear 43, mounted on a sleeve 43ª, which in turn is mounted on a stud 43ᵇ, secured to bracket 28. On sleeve 43ª is also a pinion 44, meshing with a larger gear 45, loosely mounted on rod 28′, said gear 45 in turn meshing with a gear 46, located in the rear of track 15 upon a shaft 47, supported in bearings at the end of a pair of bracket-arms 48, secured to frame 14 of post 10, one on each side thereof. Shaft 47 extends beneath track 15 and bears upon its end opposite gear 47 a sprocket-wheel 49, and in alinement therewith, loosely mounted on a stud 50, projecting from the end of an arm 51, secured to frame 14 of post 11, is a similar sprocket-wheel 52. Reference-number 53 denotes a sprocket-chain mounted upon said sprocket-wheels, the ends of which chain are secured to the lower portion of carriage 16. (See Figs. 1, 12, and 13.) It will now be seen that when clutch-section 41ª is locked to shaft 26 motion therefrom will be imparted through the train of gears 42, 43, 44, 45, and 46 to the shaft 47 and its sprocket 49 and to the chain 53, the latter rendering freely over its sprocket 52.

It has already been shown that the direction of revolution of shaft 26 is constantly changing by reason of the shifting of driving-belt 25, and it will therefore now be understood that through the described train of gearing driven by said shaft the sprocket-chain 53 will be driven first in one direction and then in that the reverse thereto, correspondingly driving (with a reciprocating motion) the carriage 16, to which said chain is secured. Said carriage is provided with flanged pulleys 17, engaging the upper and lower edges of track 15 in such manner that the carriage may travel freely thereon. To limit the forward movement of carriage 16 in each direction, I have located upon chain 53 two studs 54 and 55, serving through the coöperation of certain other mechanism to stop the movement of carriage 16 as it reaches each end of track 15. The fast or splined section 41 of the clutch referred to is grooved and is engaged by the forked lower end of a lever-arm 55, hung on a stud 55ª, projecting from a bracket 56, depending from rod 28′. The opposite end 55ᵇ of said lever-arm extends upward into the path of a cam 57, located on a sleeve 58, mounted to revolve on a stud 59, projecting from frame 14 of post 10. Also mounted on sleeve 58 is a worm-gear 60, driven by a worm 61, splined on shaft 21, near the upper end thereof, between two bearings of bracket 21ᵇ, the latter being formed with said double bearings in order that worm 61 may not become displaced endwise on shaft 21. The end of lever-arm 55ᵇ is provided with a roll 55ᶜ, that engages and rides upon cam 57, and to the said lever end 55ᵇ is hinged one end of a short bar 62, having a notch 62ª near its free end, which free end rests on a projection 64, fixedly secured to frame 14. A spring 63, connecting lever end 55ᵇ with a fixed portion of the machine, tends constantly to draw said lever end into the path of the cam 57, the latter engaging the end of lever 55ᵇ, or, rather, the roll 55ᶜ forces the lever before it, and when the high spot of the cam engages said lever end the latter imparting corresponding motion to bar 62 causes the free end of said bar to travel on its support 64 until said highest spot of the cam is reached, when the notch 62ª comes into coincidence with and locks in engagement with its support 64, (dotted lines, Figs. 3 and 17,) thus holding said lever 55ᵇ in the position indicated by dotted lines against the force of spring 63 even after the high spot of cam 57 may have become disengaged from the roll 55ᶜ. The described rocking of the lever-arm 55ᵇ imparts similar motion to the arm 55, causing the latter to force the fast or splined clutch-section 41, which it controls, into contact with the loose clutch-section 41ª, thus locking the latter to shaft 26 and imparting motion to the described train of gearing, the said clutch-sections 41 41ª remaining in such locking position until the release of the free end of arm 62, which is hooked over its support 64.

Near the end of track 15 adjacent to post 10 is hung an arm 65, hinged to a stud 65ª, the lower or free end of which arm swings in a vertical plane directly in front of the sprocket 49. Hinged at 66ª to frame 14 of the post 10 is a similar arm 66, whose end is connected by means of a link 67 to the arm 65. Also hinged at 66ª is an arm 68, which rocks in unison with the arm 66, and the free end of which arm 68 travels in a path that crosses the path of the free end of arm 62. A spring 69, connecting an extension of arm 66 to the bracket 21ᵇ, seeks to hold arms 65, 66, and 68 normally in the positions shown in full lines of Fig. 12, in which case the arm 65 hangs directly in the path of the studs 54 and 55 of the chain 53. Assuming now that the free end of lever 62 is hooked over its support 64, and that therefore the train of gearing is serving to drive carriage 16 and that the latter is traveling toward post 10, it will be seen by reference to Fig. 12 that when stud 54 engages arm 65 the latter is forced before it into the position shown in dotted lines, and through link 67 motion is imparted to arm 66 against the force of spring 69, thereby rocking arm 68, whose free end engaging arm 62 forces upward and unhooks the latter from its support 64, when spring 63 at once acts to draw arm 55ᵇ forward. Through the motion imparted thereby to arm 55 clutch-section 41 is withdrawn from locking contact with the loose clutch-section 41ª, thus stopping the latter, and thereby preventing further driving of carriage 16, which latter, it is

assumed, has now reached the position shown in dotted lines of Fig. 12. When carriage 16 is traveling in the opposite direction to that just described, the stud 55, engaging arm 65, acts in the same manner as the stud 64 to check the movement of the carriage just as it reaches the opposite end of track 15, as will be readily understood by referring to Figs. 12 and 13.

During the operation of cutting the fabric the latter is securely clamped between the rear side of track 15 and a clamping-bar 70. Said clamping-bar is suspended by arms 70ª, depending from a rock-shaft 71, supported by two brackets 72, located near the opposite ends of track 15 adjacent to the posts 10 and 11. On the end of rock-shaft 71 near post 10 is secured a slotted arm 73, which latter is engaged by the end of an arm 74, secured to a sleeve 75, mounted upon a stud 76, projecting from the frame 14 of post 10. Also secured to sleeve 75 is an arm 77, the free end of which lies in the path of a circular flange 78, secured to the gear 60, as shown in Figs. 1, 2, and 3. Flange 78 is a complete ring, except for an opening therein shown in Fig. 3. When the free end of arm 77 lies in the upper end of the opening in flange 78, as shown in Fig. 3, the arm 74 is rocked into substantially a vertical position, the end engaging the arm 73 rocking the latter and its supporting-shaft 71, so as to cause said shaft to swing bar 70 away from contact with the rear side of bar 15. When, however, wheel 60 is set in revolution, the free end of arm 77 is caused to engage the flange 78, and the latter through the described mechanism rocks bar 70 into contact with the rear side of bar 15, serving thus to clamp the fabric between said track 15 and bar 70, in which position the bar 70 remains during the operation of cutting off the fabric. The knife 18 reaches the fabric through a slot 15ª in track 15, and the bar 70 is also slotted to straddle the knife. (See Fig. 15.)

I have already referred to certain belt-shipping mechanism by means of which the position of belt 25 is automatically controlled, and this mechanism I will now proceed to describe in detail.

Reference-number 80 denotes a horizontal rod capable of endwise movement in bearings 80ª, which rod 80 forms the belt-shipper of my machine, the same bearing on its end a fork 81, through which the belt 25 passes. Mounted upon rod 80 is a frame 82, in which is a vertical slot 82ª. Directly in the rear of rod 80 and mounted in a manner explained below is a disk 83, bearing a stud 83ª, which latter lies in the slot 82ª. (See Fig. 4.) Disk 83 is caused to revolve in steps of a quarter-revolution each, and from Fig. 4 it will be very readily understood that when the various elements are in the positions therein shown should disk 83 be revolved a quarter-turn in the direction of the arrow such quarter-turn will result in causing the disk 83 (through its stud 83ª, lying in the slot 82ª of frame 82) to force said frame and connected parts forward, as shown in dotted lines, thus shipping belt 25 from its position on the middle or loose pulley 24 to the fast pulley 23ª. The second quarter-turn of disk 83 returns belt 25 to the position shown in full lines, and stud 83ª will then be at the upper end of slot 82ª. The third quarter-turn in the same manner ships the belt into the position seen in Fig. 3, and the fourth quarter-revolution returns the various elements to their starting-point. It will now be readily understood that by the revolving of disk 83 in the manner described belt 25 is introduced alternately to the fast and loose pulleys 23, 23ª, and 24, respectively, of shaft 19.

The disk 83 is mounted upon a sleeve 84, as shown in Figs. 8 and 9, which in turn is mounted to revolve upon a stud 85, fixedly secured to the lower portion of post 10. Secured to the inner end of sleeve 84 is another disk 86, of ratchet form, having four notches 86ª cut therein. Formed on or secured to one side of disk 86 is an annular flange or ring 87. Loosely mounted upon sleeve 84 is a gear 88.

Reference-number 89 denotes a coiled spring located within the annular flange 87, having one of its ends secured thereto at 89ª and its opposite end secured to a pin 90 on the gear 88. When gear 88 is in motion and disk 86 is held against rotation, it will be seen that said gear (revolving in the direction of the arrow of Fig. 6) serves to wind said spring, and after the same has been wound should the ratchet-disk 86 be released the coiled spring 89, seeking to unwind, will cause said disk to revolve, and the latter, through the sleeve upon which it and disk 83 are mounted, will impart similar motion to said disk 83, such revolving motion of the disks being limited to a quarter-turn thereof, and said disk 83 by means of its stud 83ª will serve, as already described, to operate the belt-shipper.

Reference-number 91 denotes a small frame triangular in shape and having three bearings, (denoted, respectively, by numbers 91ª 91ᵇ 91ᶜ.) By means of bearing 91ª frame 91 is fixedly mounted on stud 85. The bearing 91ᵇ supports a stud upon which is mounted a sleeve 92, bearing a pinion-gear 93 and a worm-gear 94, (see Fig. 1,) the former of which meshes with the gear 88 and the latter with a worm 95, located near the lower end of shaft 21, thus receiving from said shaft, through worm 95, worm-gear 94, pinion 93, and gear 88, power for the winding of spring 89. The bearing 91ᶜ supports centrally a lever 96, one end of which provides a bearing for a rock-shaft 97, to one end of which is secured a pawl 98, that may engage the notches 86ª of disk 86, and on the other end of said rock-shaft is mounted an arm 99. The lower end of lever 96 is connected by a spring 96ª to the bearing 91ª. Secured to sleeve 92, next to the pinion 93, is an arm 100, bearing

at its free end a dog 100ª, and secured to the arm 99 is a projection 99ª, which lies normally in the path of the dog 100.ª

To set in operation the belt-shipping mechanism, arm 99 is first raised, as shown in dotted lines in Fig. 6, this correspondingly raising pawl 98 from the notch 86ª of disk 86, which it may be engaging at the time. So soon as pawl 98 is raised from the notch 86ª spring 96ª at once rocks lever 96, as shown in dotted lines, thus drawing pawl 98 rearward, as shown in said figures by dotted lines, and preventing it from again entering said notch 86ª. Assuming now that spring 89 is wound, so soon as pawl 98 releases the ratchet-disk 86 the latter is at once caused to revolve by said spring until the pawl 98 is engaged by the next succeeding notch 86ª, and thus, through the strength of said spring, the pawl 98 is returned from its position shown in dotted lines to that shown in full lines, (the limit of forward movement of said pawl,) the latter then serving to prevent further revolution of disk 86, which, it will be observed, has made a quarter-revolution and it is assumed has served to shift the belt 25 from the loose pulley 24 to either fast pulley 23 or 23ª. By said shifting of belt 25 to the fast pulley my machine is set in motion and its various mechanisms (whose operations have already been described) are set in operation. From the shaft 21, which is now in motion, the worm 95, acting through worm-gear 94 and pinion 93, imparts motion to gear 88, and the rewinding of the spring 89 is commenced. I have already referred to the arm 100, mounted upon sleeve 92, and to the projection 99ª of the arm 99, lying in the path of the dog 100ª of said arm. My machine is so timed that the operation of rewinding spring 89 is completed at about the time carriage 16 completes its travel across track 15, and during said operation the arm 100 makes a single revolution. Just as the said rewinding operation is complete the dog 100ª comes in contact with the under side of the end of arm 99ª and lifts the same, and its arm 99 serves also to lift the pawl 98, thus again releasing disk 86, which latter, as before, makes a quarter-revolution and operates through the mechanism described to throw the belt from the fast pulley which it was driving to the loose pulley, where it remains until arm 99 is again raised, when the belt is thrown onto the companion fast pulley, there being still sufficient spring tension to accomplish this last movement of the shipping mechanism. The spring is then rewound, as already described. From the description of the shipping mechanism it will be seen that the belt will be in turn automatically shipped on pulleys 23, 23ª, and 24, the said belt when on the fast pulleys serving to drive the fast pulleys in opposite directions and likewise also the operative mechanisms of my machine.

As a safety device in connection with the belt-shipping mechanism in the event of the breaking of pawl 98 or in the event that the pawl does not catch the next succeeding notch 86ª after having been released from one of said notches a stud 86ᵇ may be located on the rear side of disk 86, as shown in Fig. 10, and a foot 96ᵇ may be formed on lever 96, which foot when said lever is rocked by the spring is drawn into the circular path traversed by said stud. Ordinarily the catching of the pawl by the succeeding notch results in rocking lever 96 and carrying the foot 96ᵇ out of the path of stud 86ᵇ. Should it happen, however, when the belt is about to be shipped from the loose pulley 24 to one of the fast pulleys 23 23ª that said pawl does not engage the next notch 86ª, the stud 86ᵇ is so located on disk 86 that it comes in contact with foot 96ᵇ before the disk 83 has been revolved sufficiently to shift the belt from the loose pulley, and therefore the machine will be brought to a "standstill." Otherwise the disk, being unchecked, would revolve sufficiently to carry the belt 25 rapidly away one or more times across pulleys 23 23ª 24 before the spring became wholly unwound, and much damage might result thereby to the machine.

Another safety device in my machine is provided by securing to the arm 55ᵇ, as shown in Fig. 17, of the clutch-lever a brake-shoe 101, of circular form, adapted to engage a similar shoe 102, formed as a complete circle and secured to the gear 45 of the described train. When the clutch-lever is worked to lock together the clutch-sections 41 41ª, arm 55ᵇ carries brake-shoe out of contact with the shoe on gear 45, thus allowing the free revolution of said gear. When, however, the clutch-lever is moved to unlock the clutch-sections 41 41ª, arm 55ᵇ at once carries brake-shoe 101 into contact with the shoe 102 and prevents undue revolution of the latter by momentum.

The fact has already been referred to that frames 14 are adjustably mounted on the posts 10 and 11. From the foregoing description and from Figs. 1, 2, and 3 of the drawings it will be understood that all the operative mechanisms of my machine excepting the belt-shipping mechanism are supported by said frames 14 and are therefore adjustable therewith. This feature is provided for the reason that in cutting different lengths of fabric it is often desirable to raise or lower said operative mechanisms. To accomplish the raising and lowering of frames 14, a horizontal shaft 103 is mounted in bearings 104 on the top of posts 10 and 11 and parallel to track 15. Within posts 10 and 11 are vertical shafts 105, as shown in Fig. 14, each of which is geared to shaft 103 by bevel-gears 103ª and 105ª, mounted, respectively, on the shafts 103 and 105. Shafts 105 are formed as screws 106 for a portion of their length, and each of said screws engages a nut 107, secured to frames 14, which latter they engage through slots 108 in the posts 10 and 11. On one end of shaft 103 is an operating-handle 108ª, which when rotated serves through

gears 103ª and 105ª to rotate the shafts 105, and the latter, through the nuts 107 on the screw portions 106 of said shafts 105, cause said nuts and the frames 14 to travel upward or downward, according to the direction in which said shafts may be rotated. The frames 14 when caused to travel vertically carry with them the mechanism which they support, such movement being in no wise interfered with because of the fact that said mechanism is connected to the main belt 25, for by reference to Fig. 14 it will be seen that the manner of "belting up" is such that any vertical movement of the shafts 21 and 24 and their pulleys simply changes the position or "run" of said belt, as shown by dotted lines in said Fig. 14.

My machine when in operation is preferably controlled by the knotter quilting-machine or other machine for preparing the web of composed fabric. Said preparatory machine is located on the floor above my described machine and is connected thereto by means of a chain 109, secured at its upper end to some suitable operative part of the knotter and at its lower end to a vertical rod 110, which engages the free end of lever 99, said rod 110 being supported in a vertical slide 111, fixedly secured to post 10 near the lower portion thereof.

Assuming that my machine is set in operation and the mechanisms described as supported by frames 14 having been adjusted to the proper height, the fabric is fed down from the "knotter" between the rear of track 15 and the clamping-bar 70 until the required length of fabric to be cut off has been introduced to the machine. At such time, by suitable mechanism in the knotter, chain 109 is drawn upward, which motion, acting through rod 110, rocks arm 99 upward, thereby effecting the releasing of the belt-shipping mechanism and shipping the driving-belt from the loose to a fast pulley, thus setting in operation the machine. The knife-carriage at this time is at one end of track 15, and so soon as belt 25 is shifted motion is at once imparted to knife 18, the latter getting up full speed before the starting of the carriage, better results being thus obtained than if such is not the case. So soon as belt 25 is shifted motion is also imparted to the vertical shaft 21, which through its worm 61 and gear 60 imparts rotary motion to cams 78 and 57, the former of which engages its mechanism in advance of the time in which the carriage-driving mechanism is set in motion. By the time the last-named mechanism is fully started the knife has attained its full speed, at which speed it continues to revolve while being carried across track 15 by the carriage 16, during which travel the cutting of the fabric is effected, the said carriage coming to rest at the opposite end of the track. Just after the carriage completes its travel the described mechanism operates, whereby the main belt is again shipped onto the loose pulley and the machine is caused to come to rest, the various mechanisms assuming their respective proper positions in readiness to act upon the next length of fabric.

While I have described my machine as used in connection with a knotter, it will be apparent that this is not essential, as when any suitable fabric to be severed is introduced into the machine the tripping of lever 99 could as well be accomplished by hand; but I prefer the described manner of use.

Having now described my invention, I claim—

1. In a fabric-cutting machine, in combination, an initial driving-belt, a transversely-slotted shipper-rod controlling said belt, a shipper-rod starter consisting of a spring-actuated revoluble crank-arm engaging the said shipper-rod slot, means for revolving said crank-arm with a step-by-step movement and means for maintaining the tension of the crank-arm-controlling spring, substantially as specified.

2. In a fabric-cutting machine, in combination, a knife revolubly supported in a carriage ways upon which the carriage is mounted to travel, mechanism for moving said carriage reciprocally along its ways, said last-named mechanism being controlled primarily by a single driving-belt, belt-shipping mechanism including a transversely-slotted longitudinally-movable shipper-rod and a spring-actuated revoluble crank-arm engaging said shipper-rod slot, substantially as specified.

3. In a fabric-cutting machine, in combination, a fabric-clamping device consisting of slotted ways and a coacting movable bar, a carriage mounted on said ways, mechanism for moving said carriage along the said ways; said carriage-actuating mechanism including a belt-shipper and spring-controlled mechanism for starting said shipper into action, substantially as specified.

4. In a fabric-cutting machine, in combination, ways, and means for adjusting the same in the direction of the movement of the fabric, a carriage mounted on said ways a revolving knife mounted in the carriage a chain secured to said carriage and mounted on wheels at each end of the ways, mechanism connected with one of said chain-supporting wheels for driving said wheel to cause the carriage to travel along its ways, and means consisting of projections on said chain both for starting into action and stopping the said chain-actuating mechanism, substantially as specified.

5. In combination, in a fabric-cutting machine, a knife mounted in a carriage that is in turn mounted to travel across the fabric reciprocally on suitable ways, means for adjusting said ways in the direction of travel of the fabric to vary the length of the cut sections and mechanism for moving the said knife-carriage along its said ways, substantially as specified.

6. In a fabric-cutting machine, in combi-

nation, a fabric-clamping device consisting of slotted ways that are adjustable in the direction of travel of the fabric and a hinged bar adapted to coact with said slotted ways, a carriage mounted to travel on said slotted ways, a knife mounted in said carriage, and mechanism for moving the said knife-carriage forward and backward along its said supporting-ways, substantially as described.

7. In a fabric-cutting machine, in combination, a supporting-frame consisting of uprights and connecting tie-rods, a fabric-clamp consisting of slotted ways secured to sliders on said uprights and a coacting movable bar, vertical screw-shafts mounted in said uprights and tapped into an extension of said sliders, and mechanism for connecting said screw-shafts to revolve them in unison, to adjust the said ways vertically, substantially as specified.

8. In a fabric-cutting machine, in combination, a driving-belt, a belt-shipper mounted to reciprocate in suitable supports, mechanism for actuating said shipper consisting of a revoluble spring-actuated notched disk bearing a crank-pin that engages the said shipper, a stop-lever 98 engaging normally and successively the notches of the said disk, and means for moving the said stop-lever out of engagement with said disk to allow the belt-shipper to start into action.

9. In a fabric-cutting machine, in combination, ways extending transversely to the feed movement of the fabric, a carriage mounted to travel on said ways, a chain connected with said carriage and mounted upon pulleys located at opposite ends of said ways, one of said pulleys being secured to a shaft 27, whose other end bears a fixed pulley 27^b and a loose pulley 27^a, an initial driving-shaft bearing fixed pulleys 23 23^a and a loose pulley 24, a driving-belt engaging the two described series of pulleys on shaft 27 and the initial driving-shaft, in manner as set forth, a movable shipper engaging said belt, and mechanism for actuating said shipper with a prescribed step-by-step movement, all substantially as specified.

10. In combination, a fabric-clamping device consisting of slotted ways and a coacting movable bar, a carriage mounted on said ways, mechanism for moving said carriage reciprocally on said ways, means for moving said clamping-bar into and out of operative engagement with said ways, and means for adjusting said clamping device in the direction of movement of the fabric independently of the clamp-operating mechanism.

WILLIAM H. PALMER, JR.

Witnesses:
FRANK H. ALLEN,
MAY F. RITCHIE.