M. L. & C. M. SHAPERA.

CLOTH PILING MACHINE.

APPLICATION FILED FEB. 28, 1912.

1,067,379.

Patented July 15, 1913.

4 SHEETS—SHEET 1.

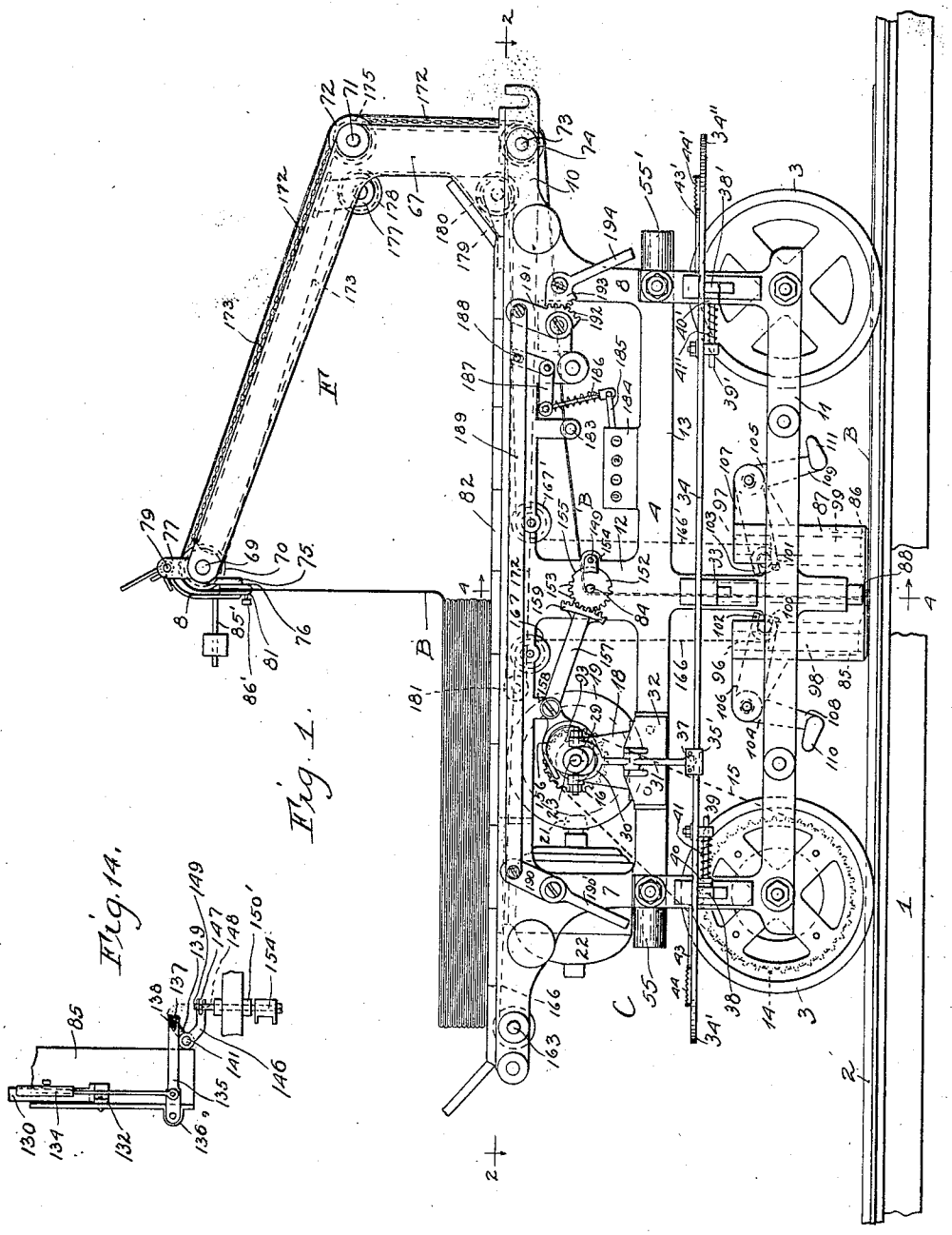


Fig. 1.

Fig. 14.

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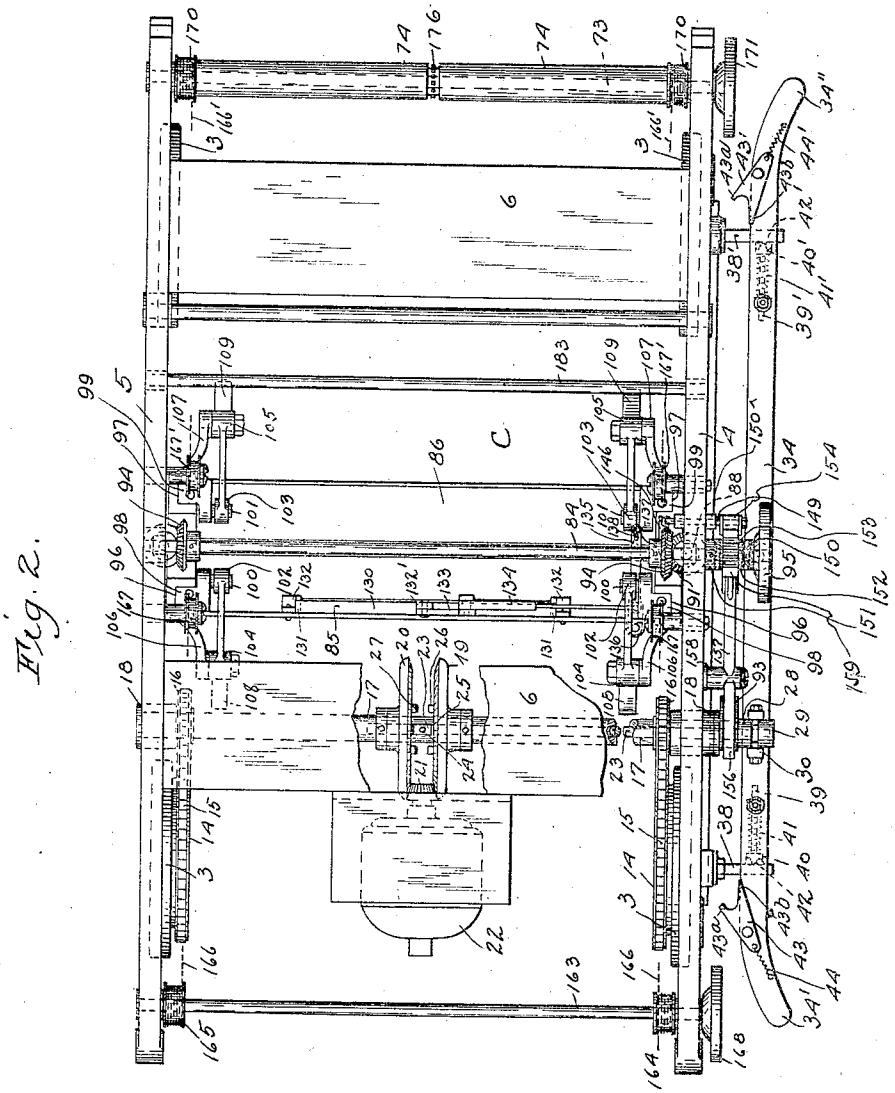
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4 SHEETS—SHEET 2.

Fig. 2.



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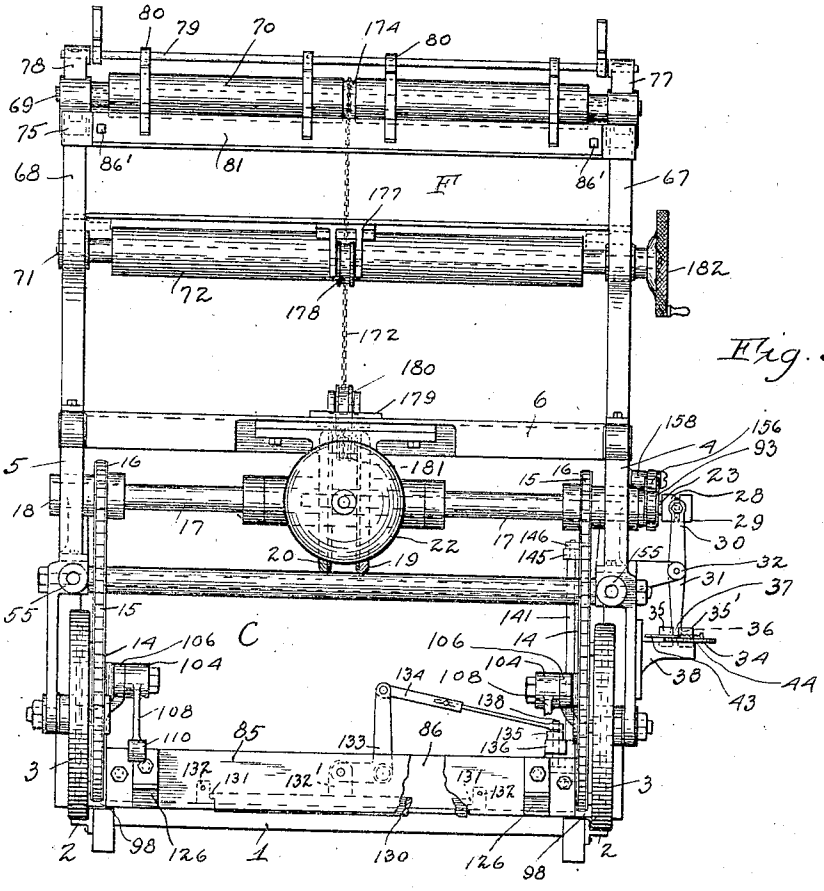


Fig. 3.

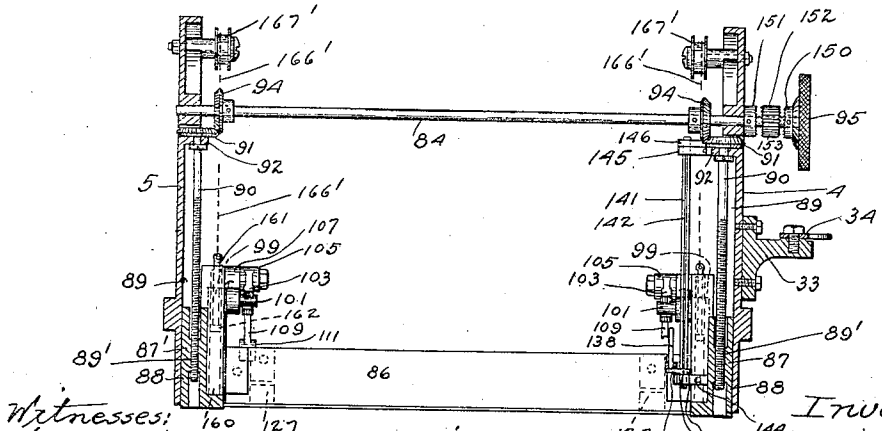


Fig. 4.

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4 SHEETS—SHEET 4.

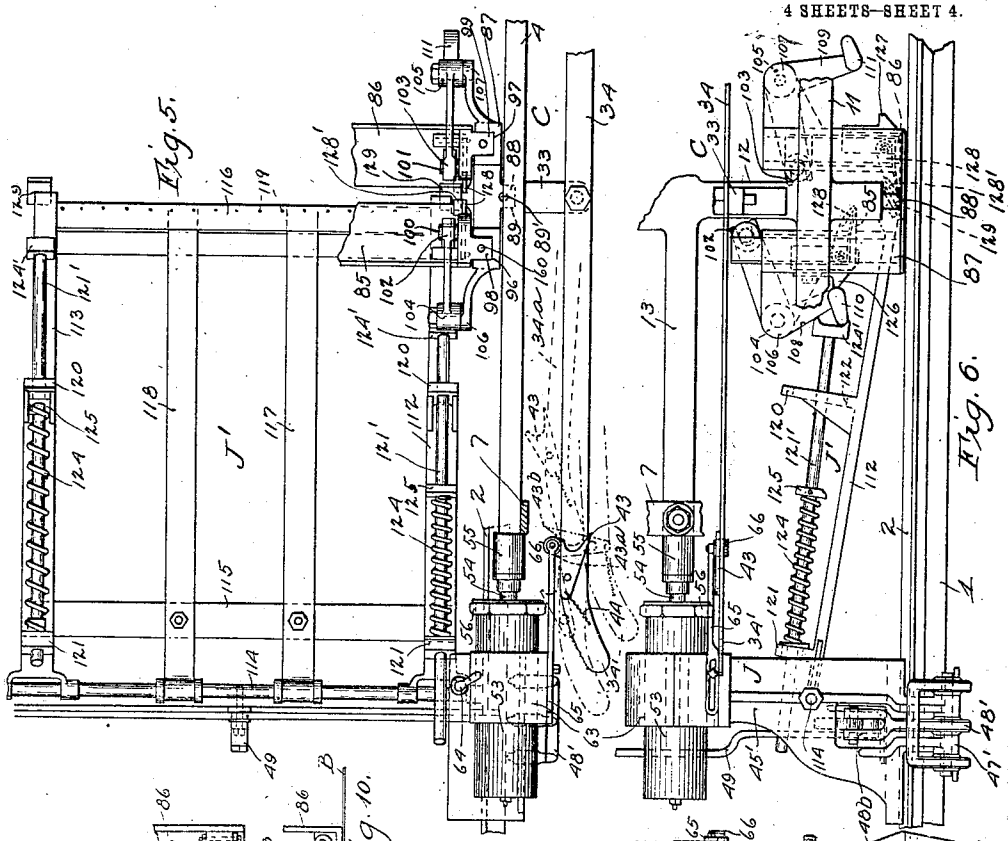


Fig. 5.

Fig. 6.

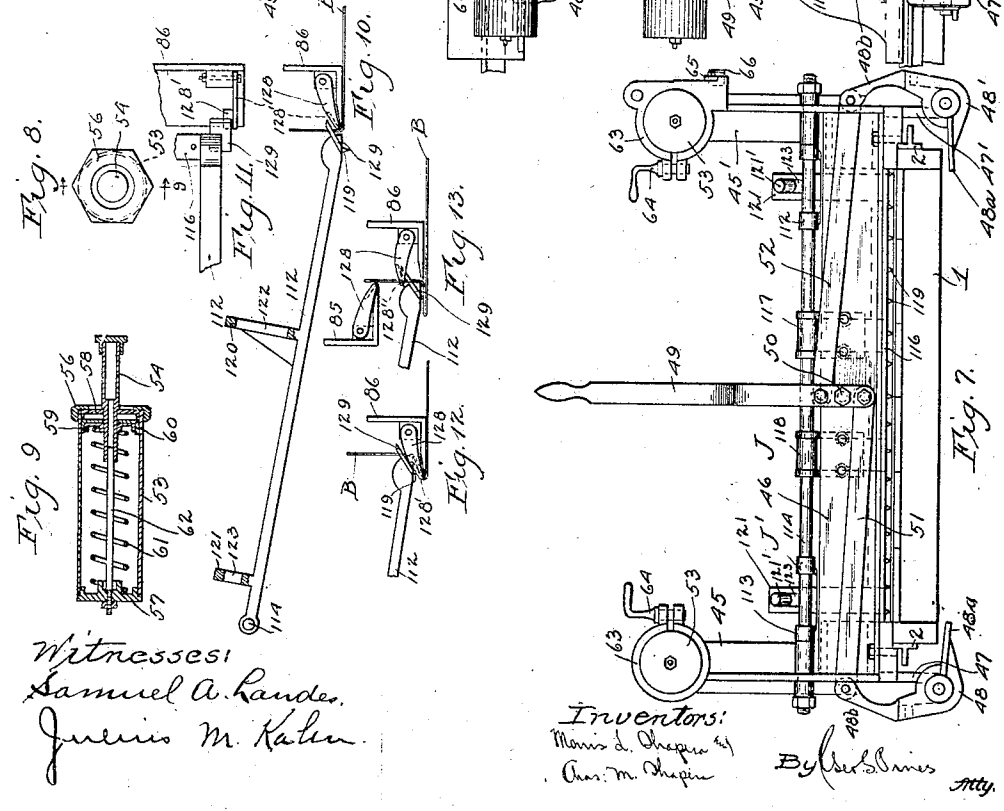


Fig. 7.

Fig. 8.

Fig. 9

Fig. 10.

Fig. 11.

Fig. 12.

Fig. 13.

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UNITED STATES PATENT OFFICE.

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CLOTH-PILING MACHINE.

1,067,379. Specification of Letters Patent. Patented July 15, 1913.

Application filed February 28, 1912. Serial No. 680,550.

To all whom it may concern:

Be it known that we, MORRIS L. SHAPERA and CHARLES M. SHAPERA, citizens of the United States, and residing at Chicago, county of Cook, and State of Illinois, have invented new and useful Improvements in Cloth-Piling Machines, of which the following is a specification.

Our invention relates to cloth piling machines and involves various features of improvement over what is disclosed in our Patent Number 964,124 and our Patent Number 1,002,459, issued respectively July 12th, 1910, and September 5th, 1911.

Among the important objects of our present invention are: to provide improved abutment mechanism for stopping without shock, the carriage at the ends of its back and forth travels on the track and to start the carriage on its reverse travel independently of the carriage propelling motor; to provide improved construction, operation and control for the guide bar mechanism; to provide pilot mechanism for determining the amount of raising or lowering of the guide bars with reference to the cloth piled on the table; to provide improved clutch mechanism to be operated by the pilot mechanism to control the connection of the guide bar adjusting mechanism with continuously operating drive mechanism; to provide improved clamping mechanism for cloth laid on the table and improved cooperation of such clamping mechanism with the guide bar mechanism; to provide manually controllable mechanism for enabling the guide bars to be independently raised or lowered; to provide improved guiding means for guiding the cloth from a bolt over and about the various cloth guide rollers and rods so that the cloth end can be more readily inserted between the guide bars preparatory to piling the cloth on the table; to provide improved means for maintaining proper tension on the cloth while it is being piled; to combine the abutment mechanism and clamping mechanism at each end of the table into a unitary structure having clamping mechanism for adapting it to be readily applied to or entirely detached from the table; and in general to provide more improved and efficient construction in a machine of the character referred to.

All the various features of our invention are illustrated on the accompanying drawings in which,

Figure 1, is a front elevational view of the carriage. Fig. 2, is a plan view looking from plane 2—2, Fig. 1, Fig. 3, is an elevational view looking toward the left end of the carriage, Fig. 4, is a sectional view taken from plane 4—4, Fig. 1, Fig. 5, is a plan view of the abutment and clamping mechanism at the left end of the table and of the left end of the machine to show the coöperation of the carriage parts with the abutment and clamping mechanism, Fig. 6 is a front elevational view of the parts shown in Fig. 5. Fig. 7, is an elevational view looking at the abutment and clamping mechanism from the left; Fig. 8, is an inner end view of an abutment plunger mechanism, Fig. 9, is a sectional view taken from plane 9—9, Fig. 8, Fig. 10, is a front elevational view of the clamping frame and the guide bar just about to engage therewith, Fig. 11, is a plan view of the parts shown in Fig. 10, Fig. 12, is a view like Fig. 10, showing the clamping frame raised by engagement with trip latches on the guide bar, and showing how the cloth is tucked under the clamping frame, Fig. 13, is a similar view showing the trip latches gliding over the clamping frame upon reverse travel of the carriage, and Fig. 14, is a plan view of the pilot bar and the lever mechanism for connecting it with the clutch mechanism controlling the adjustment of the guide bar mechanism.

The operative parts are mounted on a table 1 and comprise the carriage C, and an abutment frame J and clamping frame J′ at each end of the table; the tracks 2, 2 being provided on the table for accommodating wheels 3 of the carriage. The carriage comprises front and rear frames 4 and 5 connected together by suitable beams or bars 6, the side frames each comprising vertical end bars 7 and 8, top and bottom horizontal bars 10 and 11, and an intermediate vertical bar 12 and horizontal bar 13. A wheel is pivoted to each lower corner of the frames, those at the left being each provided with a sprocket wheel 14, the sprocket wheels being connected by chain belts 15 with sprocket pinions 16 on the propelling shaft

17 extending transversely through the carriage and journaled in bearings 18 mounted on the intermediate bars 13 of the carriage frames. Pivoted to rotate loosely on this shaft are forward and reverse bevel gears 19 and 20 both permanently in mesh with a drive pinion 21 on the shaft of the electric propelling motor 22. The front end of the propelling shaft is tubular and journals a smaller shaft 23 carrying at its inner end the transverse clutch bar 24 extending outwardly through slot 25 in the shaft 17 between the bevel gears. The inner faces of the gears 19 and 20 have clutch teeth 26 and 27 respectively, the clutch bar, when in its outer position, coöperating with teeth 26 to connect the motor in forward driving relation with the shaft 17, and when in its inner position, coöperating with teeth 27 to connect the motor in reverse driving relation with said shaft. The shaft terminates at its front end in collars 28 and 29 between which engages a fork 30 whose arm 31 is pivoted at an intermediate point on bearing frame 32 secured to front bar 13. A bracket 33 on front bar 12 and between front bars 11 and 13 pivots a longitudinal clutch lever 34 at its center to be swung in a horizontal plane. The lever, between its pivot and its left end has blocks 35, 35′ clamped thereto and forming a socket 36 for the lower ball end 37 of arm 31 of the fork 30, so that as lever 34 is swung back and forth the fork will be moved back and forth to move clutch shaft 23 out and in to connect the motor for forward or reverse driving. When the lever is in neutral position the clutch bar 24 will be midway between the clutch teeth of the gears and the driving shaft is not driven, although the motor runs continuously.

The clutch lever 34 is formed from a flat bar, its ends 34′ and 34″ being bent gradually forwardly. The ends of the lever rest on and slide over brackets 38, 38′ respectively, extending forwardly from the front frame 4. The lever is yieldingly locked in neutral position by detent plungers 39, 39′ whose wedge heads 40, 40′ are pressed by springs 41, 41′ toward notches 42, 42′ formed on brackets 38, 38′ respectively. When the lever is swung from neutral position the wedge detent heads are forced out of the slots and when the lever is returned to neutral position the heads are returned to the slots and lock the lever in neutral position. Near the ends of the lever and on top thereof are pivoted pawls 43, 43′, springs 44, 44′ tending to hold the pawls in diagonal position with their inner ends extending toward each other. These pawls coöperate with the abutment frames J as will be explained later.

Each abutment frame J comprises side standards 45 and 45′ connected at their bases by a cross board 46. The standards have brackets 47, 47′, respectively, extending downwardly adjacent the sides of the table 1, and the brackets pivot, respectively, the bell crank clamping levers 48, 48′. The lower arms 48ª of these levers extend inwardly below the sides of the table to firmly clamp against the table bottom when the upper arms 48ᵇ are swung outwardly. To control the rotation of the levers, we provide a lever 49, pivoted to the board 46 at 50, and connected above and below its pivot with links 51 and 52 respectively, the outer ends of these links being pivoted to the ends of arms 48ᵇ of the levers 48 and 48′. When the lever 49 is vertical, as shown in Fig. 7, the clamping levers 48 and 48′ release the table, but when the lever is swung to horizontal position the clamping levers are rotated to securely clamp the table to lock the abutment frame thereto.

Each of the standards 45 and 45′ carries at its upper end a barrel 53 having a plunger rod 54, the plunger rods of the two abutment frames extending inwardly toward the carriage C to be struck by the abutment lugs 55 and 55′ at the opposite ends, respectively, of the intermediate horizontal bars 13 of the front and rear carriage frames 4 and 5, such engagement being illustrated in Figs. 5 and 6.

Referring to Figs. 5, 6 and 9, each barrel has the end caps 56 and 57, the plunger rod extending through the cap 56 and secured to a piston or plunger comprising rings 58 and 59 clamping between them a leather washer 60. Between the ring 59 and the cap 57 is interposed a compression spring 61 for resisting the inward thrust of the plunger rod. A rod 62 secured to the cap 57, extends through the barrel and into the hollow plunger rod to guide the plunger rod. Each barrel is longitudinally adjustable by being within a split sleeve 63 at the top of its respective standard, the sleeves being clamped to the barrels by screws 64. Each front standard 45′ carries on its front side an arm 65 pivoting at its end a cam roller 66 for coöperating with the ends 34′ and 34″ of the clutch lever 34 and the pawls 43 on said bar.

The control of the bodily movement of the carriage can now be clearly understood. Suppose that the lever 34 has been swung clockwise from neutral position (see 34ª Fig. 5), the left end thereof will be in and the clutch mechanism will have been set to cause the motor to propel the carriage toward the left. When the carriage approaches the left end of the track, the lugs 55 will strike the abutment plunger rods 54 at the left end of the table and will force these rods inwardly against the resistance of the springs 61. Just before the plunger rods are struck, the end 34′ of clutch lever 34 will strike cam roller 66 (see dotted lines

Fig. 5), and the clutch bar will be moved to normal position, (see full lines Fig. 5), to disconnect the driving motor just before impact of the carriage with the plunger rods, but the carriage, owing to its momentum, will continue toward the left a sufficient distance to allow the pawl 43 to swing back to normal after having been swung forwardly by the cam roller. (See dot-dash lines Fig. 5). The power acquired by the springs 61 when thus compressed by the carriage, will first stop the carriage and will then start it on its movement toward the right. After a short distance of such travel, the cam roller 66 will engage between the teeth 43^a and 43^b of the pawl 43 and the pawl will be swung toward the left, (see double dot-dash lines Fig. 5,) such swing causing the clutch lever to be swung in counter clockwise direction from its normal position thereby to adjust the clutch mechanism to cause the motor to drive the carriage to continue its travel toward the right. When the carriage approaches the right end of the table, its lugs 55′ and the clutch bar end 34″ and the pawl thereon will coöperate with the right end cam roller and plunger mechanism and the lever 34 will be moved to neutral position, the motor then disconnected, and the carriage then stopped and then started by the plunger springs on its travel toward the left. Thus the motor is relieved of the heavy burden of reversing the travel of the carriage, the abutment plungers first taking up and cushioning the shock of stopping the carriage and then giving the carriage a good start in the opposite direction before the motor is again connected to take up the propulsion.

A cloth feeding and guiding frame F is mounted on the carriage C and comprises side standards 67 and 68 mounted on the right ends of the front and rear frames 4 and 5 respectively, the standards extending upwardly and then toward the left and terminating substantially over the center of the carriage. A rod 69 connects the ends of the standards and journals a roller 70, while a rod 71 connects the standards at their bends and journals roller 72. A shaft 73 connects the front and rear frames 3 and 4 below roller 72 and journals rollers 74. A bar 75 is also secured to the ends of the standards and carries a tension jaw plate 76. In upward extensions 77 and 78 on the ends of the standards a rod 79 is secured for supporting hinges 80 carrying the tension jaw plate 81 for coöperating with jaw plate 76.

On the top of the front and rear carriage frames 3 and 4 a table 82 is provided for supporting bolts of cloth B to be spread and laid. The cloth passes from the bolt between the jaw plates 76 and 81, then over rollers 70, 72 and 73, then over shaft 84, and then downwardly between the guide bars 85 and 86 which will later be described. In order to adjust the tension on the cloth the tension jaw 81 is provided with weighted arms 85′ which tend to force the tension jaws together to clamp the cloth, and set screws 86′ extend through one of the jaw frames and abut against the other, these set screws serving to adjust the gap between the jaw plates to thereby adjust the pressure of the jaws on the cloth.

The guide bar supporting mechanism is best shown in Figs. 2, 3, 4, 5 and 6. Blocks 87 and 87′ are provided for the front and rear frames 4 and 5, each block having a vertical rectangular guide rib 88 engaging in a guide slot 89 formed in the vertical bar 12 of the frame so that the block may slide up and down. Each rib has a threaded opening 89′ for receiving a screw 90 terminating at its top in a bevel gear 91 and journaled in the bearing bracket 92 extending inwardly from the bar 12. The shaft 84 is journaled in the side frames 4 and 5 above the screws 90 and carries bevel pinions 94—94 meshing with the gears 91—91 of the screws 90. The front end of this shaft terminates in a hand wheel 95 turning of which will cause simultaneous raising or lowering of the blocks 87 and 87′. This shaft is also controlled automatically as will be described later. Each block at its sides has vertical grooves 96 and 97 for receiving the slide bars 98 of the opposite blocks 87 and 87′ which bars support at their lower ends the guide bar 85, while the slide bars 99 support at their lower ends the guide bar 86. These guide bars are in the form of angle bars and are arranged side by side with their vertical flanges at the outside and with their horizontal flanges normally in a common plane and separated by a narrow gap of sufficient width to allow passage of the cloth between them. The bars 98 and 99 have respectively at their upper ends the inwardly extending pins 100 and 101 engaged respectively by the forked ends 102 and 103 of bell crank levers 104 and 105 pivoted at their elbows to the brackets 106 and 107 extending from the corresponding block 87. The downwardly extending arms 108 and 109 of the bell crank levers terminate in shoes 110 and 111 respectively. Pressure on these shoes toward the block 87 will cause the bars 98 and 99 and the guide bars supported thereby to be raised. Such pressure on the shoes is controlled automatically during engagement of the carriage with the clamping frames J′ at the ends of the track. Referring to Figs. 5, 6 and 7 each of the clamping frames comprises front and rear bars 112 and 113 pivoted at the outer ends to a shaft 114 extending between the abutment standards 45 and 45′ of the corresponding abutment

frame J. Cross bars 115 and 116 connect together the outer and inner ends respectively of the bars 112 and 113, the frame being further strengthened by longitudinal bars 117 and 118 connected to the bars 115 and 116 and pivoted at the outer ends to the shaft 114 as shown. The bar 116 is comparatively heavy and has the points 119 extending downwardly therefrom for receiving the cloth from the guide bars and holding the various layers in place after laying thereof. On each of the bars 112 and 113 a bracket 120 extends upwardly about midway of the bar, and at the outer end of each bar an abutment lug 121 extends upwardly. A plunger rod 121′ extends over each bar 112 and 113 and extends through the vertical slots 122 and 123 of the bracket 120 and lug 121 respectively. A compression spring 124 encircles each plunger rod between the abutment lug and a collar 125 on the rod. The inner end of each rod has the abutment head 124′, these abutment heads receiving the shoes of the guide bar lifting bell crank levers as the carriage travels back and forth. The collars 125 normally rest against the brackets 120, but as illustrated in Figs. 5 and 6 the carriage has traveled toward the left and the shoes 110 have engaged the plunger rods 121′ to push these rods outwardly and to raise the guide bar 85. The guide bars 85 and 86 have abutment lugs 126 and 127 secured thereto against which the shoes abut upon swing of their bell crank levers, such engagement being shown in Fig. 6.

As before described the cloth coming from the feed frame F passes down through the gap between the guide bars 85 and 86. As the carriage travels back and forth the advance guide bar is lifted as has been described, to allow the other guide bar to tuck the cloth under the points of bar 116 of the engaged clamping frame. To enable the bar 116 to be readily lifted to allow insertion of the cloth, a trip latch 128 is provided at each end of each guide bar. These trip latches are best shown in Figs. 5, 6, 10, 11, 12 and 13, each being in the form of a plate pivoted at its rear end in the bend of the guide bar and extending forwardly to the inner edge of the guide bar against which it normally rests. Each latch plate has at its outer end a laterally extending diagonal web 128′ for coöperating with a diagonal cam plate 129 extending laterally from the corresponding bar 112 or 113 of the clamping frame J′. As shown in Figs. 5, 6, 10 and 11, the advance guide bar has just been raised by engagement of the shoes 110 with the plunger rods 121′, and the webs 128′ of the trip latches 128 of the other guide bar are just about to engage under the diagonal plates 129 on bars 112 and 113. Upon such engagement the clamping frame is swung upwardly about shaft 114, as shown in Fig. 12 and the bar 116 is raised sufficiently to allow the edge of the guide bar to insert or tuck the cloth under the points 119. Before the carriage is stopped and recoiled by the abutment mechanism the latch webs will have passed beyond the plates 129 and the bar 116 allowed to drop to hold the cloth just received thereby. As the carriage now begins travel in the opposite direction the diagonal webs of the latches will slide over the tops of the plates 129 as shown in Fig. 13, the latches merely swinging idly upwardly and then falling back to normal position. When the carriage reaches the clamping and abutment mechanisms at the other end of the track the same operations are carried out by the guide bars, a new layer of cloth being each time added to the pile on the table.

The entire guide bar mechanism must of course be raised gradually as the pile on the table increases in height, and the guide bars should at all times glide smoothly over the cloth. To accomplish this we provide mechanism which automatically controls the raising and lowering of the guide bar supporting blocks 87 and 87′ to keep the guide bars at all times and at all points intimately against the cloth as it is piled on the table. As best shown in Figs. 2 and 3 a floating pilot bar 130 is mounted on the guide bar 85 and is adapted to move vertically by engagement of its end extensions 131 in guide plates 132 secured to the guide bar. When these extensions reach the bottom of the guide plates the lower edge of the pilot bar extends a short distance below the lower edge of its supporting guide bar. A lug 132′ extending up from the middle of the pilot bar is pivoted to the horizontal arm of a bell crank lever 133 which is pivoted at its elbow to the vertical flange of the guide bar. The vertical arm of the lever pivots at its end to the inner end of a connecting rod 134 whose other end pivots to the lever 135 at an intermediate point thereof. One end of this lever is pivoted to a lug 136 on the guide bar structure while its other end has the slot 137 receiving the crank pin 138 on crank lever 139. The hub 140 of this crank lever receives a vertical shaft 141 having the longitudinal channel 142, a pin 143 in hub 140 extending into this channel so that the shaft will turn upon swing of lever 139, the lever being free, however, to slide vertically along the shaft as the guide bar mechanism supporting blocks are raised and lowered. The lower end of the shaft 141 journals in a bearing block 144 extending inwardly from the block 87, the upper end of the shaft journaling in bearing block 145 extending inwardly from the bearing bracket 92 which journals the screw shaft 90. A crank lever

146 is secured to the upper end of shaft 141 above the bearing block 145. The end of lever 146 has slot 147 receiving pin 148 extending downwardly from the shaft 149 journaled in the hub 150′ on the bar 12 of side frame 4 of the carriage. With this arrangement of transmission mechanism between the floating pilot bar 130 and shaft 149, raising of the bar causes rotation of shaft 141 to cause the shaft 149 to slide forwardly, while dropping of the pilot bar will result in rearward slide of shaft 149. Vertical movement of the pilot bar will result in corresponding movement of the guide bars by mechanism which will now be described.

On the shaft 84 which controls the screw shafts 90, a ratchet collar 150 is secured adjacent the hand wheel 95, and on the same shaft adjacent the carriage frame is a ratchet collar 151, the collars having teeth on their inner faces. Slidable on shaft 84 between the collars is a wheel 152 having ratchet teeth on its opposite faces, and having gear teeth 153 extending part way about its periphery. Secured to the outer end of shaft 149 is a head 154 whose forked end receives that part 155 of the wheel 152 which has no gear teeth. Back and forth movement of wheel 152 upon raising and lowering of the pilot bar will result in backward and forward slide on shaft 84 of the wheel 152 to carry its ratchet teeth into engagement with the teeth on collars 150 and 151 to turn shaft 84 one way or the other, the wheel 152, when in intermediate position being disengaged from both collars.

As best shown in Figs. 1, 2 and 3 the front end of propelling shaft 17′ carries a circular disk 93, eccentrically mounted thereon. This disk receives the forked left end 156 of lever 157 pivoted at an intermediate point to lug 158 extending down from top bar 10 of frame 4. The right end of the lever has the gear segment 159 meshing with the teeth 153 of wheel 152 on shaft 84. As the propelling shaft rotates the lever 157 rocks and wheel 152 is oscillated through an arc of revolution. As the pilot bar 130 rises and falls the shaft 149 moves forward and back and the wheel 152 carries its front and rear ratchet teeth respectively into engagement with ratchet collars 150 and 151, and if wheel 152 is oscillating the shaft 84 will rotate one way or the other. The teeth on the front face of wheel 152 and on collar 150 are so inclined that engagement thereof will cause shaft 84 to rotate clockwise so that the screw shafts 90 will be turned to raise the guide bar mechanism supporting blocks 87 and 87′. In other words, when the wheel 152 and collar 150 are in engagement the shaft 84 will be advanced clockwise during clockwise oscillation of wheel 152 by rock lever 157, while during counter clockwise rotation of wheel 152 by the lever 157 the ratchet teeth glide idly over each other. In the same manner shaft 84 is rotated counterclockwise to cause lowering of the blocks 87 and 87′ when wheel 152 is shifted into engagement with collar 151. Thus whenever wheel 152 engages with one of the collars 150 and 151 the guide bar blocks 87 and 87′ will be raised or lowered, while when wheel 152 is in neutral position it will still oscillate but shaft 84 remains at rest. The guide bars thus move synchronously with the pilot bar as the pilot bar shifts vertically to follow the gradually increasing height of the pile on the table as layer after layer is added. The height of the pile also varies due to uneven thickness of the cloth at different points, but the pilot bar can readily follow the varying level and the guide bars automatically follow and always remain intimately against the cloth to smooth it out and to prevent it from wrinkling. When the carriage approaches the left end of the track and the guide bar carrying the pilot bar is raised upon impact of bell crank levers 104 with the clamping frame J′ the pilot bar will drop as far as plates 132 will permit. However, by this time the motor will have been disconnected from propelling shaft 17 by actuation of clutch lever 34 so that although wheel 152 will have been shifted against collar 151 it will not be turned. The pin 138 of crank lever 139 is extended upwardly sufficiently so that lever 135 will remain in engagement therewith during raising of the guide bar which carries this lever 135.

As before described shaft 84 can be controlled manually by hand wheel 95 to raise the blocks 87 and 87′ carrying the guide bar slides. Provision is also made for manually raising either guide bar. As best shown in Fig. 4 each slide bar 98 and 99 has a longitudinal bore 160 for accommodating a rod 161 having the head 162 at its lower end. The mouth of each bore is contracted to prevent escape of the head 162 therefrom but to allow free vertical slide of the rod in the bore so that the slide bars with the guide bar supported therefrom can move vertically freely and independently of the rods 161. Connecting the left ends of the carriage frames 4 and 5 is a shaft 163 carrying at its ends and just within the frames the drums 164 and 165. A chain or cord 166 winds about each drum the chains passing over sheaves 167 journaled to the corresponding carriage frames over the rods 161 of the adjacent slide bars 98, the ends of the chains connecting with the upper ends of the rods. Thus turning of shaft 163 by a hand wheel 168 at the front end thereof will cause raising of the rods 161 until the rod heads engage the contracted mouths of the bores in the slide bars, and

the slide bars will then be raised. Likewise the shaft 73 connecting the right ends of the frames 4 and 5 and journaling roller 74 already referred to, also mounts drums 170, from which chains 166′ pass over sheaves 167′ and to the rods 161 of the slide bars 99, the shaft having the hand wheel 171 at its front end. Thus each guide bar can be independently raised manually.

When a bolt of cloth has been piled on the table, a fresh bolt is applied to table 82 and the end of the cloth must be fed over the various rollers and shafts and between the guide bars. To conveniently accomplish this we provide guiding mechanism comprising a chain 172 having sharp hooks 173 for engaging the cloth end. At the middle of shafts 69, 71 and 73 sprocket wheels 174, 175 and 176 respectively are secured for receiving one leg of the chain. Just in advance of and below wheel 175 a bracket 177 journals a sheave 178, and just in advance of and above wheel 176 a bracket 179 journals a sheave 180, these sheaves receiving the lower leg of the chain. The left end of the chain passes about sheaves 181 journaled from the carriage frame above shaft 84 and to the left thereof. A hand wheel 182 is secured to the front end of shaft 71 by means of which the chain can be propelled. The end of the cloth of a fresh bolt is first passed between the jaw bars 76 and 81 and then over roller 70, the cloth being then hooked to one of the hooks 173 and the hand wheel 182 turned. The cloth will then be carried by the chain over rollers 70 and 72, then about roller 74, then over rod 183 and shaft 84, the cloth being then released from the chain and passed down through the gap between the guide bars, and then spread out smoothly on the pile on the carriage supporting table and the carriage can then be started. Thus the cloth can be conveniently and readily guided into position for operation of the carriage.

Means are also provided for counting the layers laid on the table. A register 184 mounted on front bar 13 has the operating lever 185 connected by link 186 with one arm of bell crank lever 187 pivoted to frame 4, the other arm of the lever being slotted to receive pin 188 on bar 189 connecting levers 190 and 191 pivoted to frame 4 near the left and right ends thereof. Lever 190 has a downwardly extending arm 190′ which strikes the abutment standard 45 whenever the carriage reaches the left end of its travel, each actuation of the lever causing bar 189 to move to the left to swing bell crank lever 187, and to actuate the register. Lever 191 has teeth 192 meshing with teeth on segment 193 pivoted to bar 8, the arm 194 extending from the segment abutting against the standard 45 at the right end of the table each time the carriage reaches the right end of its travels, and bar 189 is again moved to the left and the register actuated. Thus each time a layer of cloth has been added to the pile the register is actuated and the layers counted.

To operate the machine the motor is connected to an electric circuit to run continuously. If the carriage travels toward the left as indicated in Figs. 5 and 6 the clutch lever 34 will be in its inner position at the left end. Before the abutment lugs 55 strike the abutment plungers the end 34′ of the clutch lever will engage with roller 66 and the clutch lever will be shifted to neutral position to disconnect the motor from driving engagement with the carriage. The shoes 110 will strike the plunger rods 121′ and the advance guide bar will be raised as indicated in Fig. 6, and the trip latches of the guide bar 86 will just about engage with the clamping frame J′. The plunger abutments have by this time received the carriage to retard its movement and to eventually stop it and recoil it to start it on its reverse travel. Before the carriage is stopped, the trip latches on guide bar 86 will have lifted frame J′ to tuck the clotch under the bar 116 and points 119, and after passage of the trip latch plates 128′ past the plates 129 on bars 112 and 113, the frame J′ falls and the points 119 clamp the cloth to hold it while the carriage travels to the right. When the carriage begins its return movement the pawl 43 will engage roller 66 to swing out the end 34′ of the clutch lever so that the motor is clutched in to take up the propulsion of the carriage to the right. When the carriage reaches the right end of its travel it coöperates with the frames J and J′ at that end of the table and guide bar 86 is raised to allow guide bar 85 to tuck the cloth under the frame J′ whereupon the carriage is recoiled and its propulsion to the left taken up by the motor. The floating pilot bar 130 follows the increasing height of the pile and the varying levels thereof and the guide bars are correspondingly adjusted as has been described.

As changes and modifications are of course possible both in construction, arrangement and operation without departing from the scope of the invention, we do not desire to be limited to the precise construction, arrangement and operation shown, except as specified in the appended claims.

We claim as follows:

1. In a cloth piling machine, the combination of a carriage, a table on which said carriage is adapted to be reciprocated, an abutment frame at each end of the table for stopping the carriage at the ends of its reciprocations, each abutment frame comprising abutment standards and a connecting beam, clamping jaws pivoted to each abutment frame, and levers controlling said

clamping jaws to clamp the abutment frame to said table.

2. In a cloth piling machine, the combination of a carriage, a table on which said carriage is adapted to be reciprocated, an abutment frame at each end of the table for stopping the carriage at the ends of its reciprocations, each abutment frame comprising abutment standards and a connecting beam, clamping jaws pivoted to each abutment frame, said jaws adapted to swing toward or away from the abutment frame beam to clamp or to release said table, and lever mechanism for controlling said jaws.

3. In a cloth piling machine, the combination of a carriage, a table having tracks on which said carriage may reciprocate to pile cloth on the table, an abutment frame at each end of the table for stopping the carriage at the ends of its back and forth travels, a clamping frame at each end of the table for receiving the cloth from the carriage and for holding the folded ends thereof, the abutment frame and clamping frame at each end of the table forming part of the same structure, clamping jaws for detachably clamping each structure to the table, and lever mechanism controlling the jaws.

4. In a cloth piling machine, the combination of a carriage, means for propelling said carriage, a pair of guide bars extending transversely over the path on which said carriage travels, slide bars extending from the ends of each guide bar and vertically reciprocal on the front and rear frames of said carriage, bell crank levers pivoted at their elbows and each having one arm pivoted to one of said slide bars, and clamping frames at the ends of the carriage path for coöperating with said guide bars to receive cloth fed thereby, the other arms of said bell crank levers abutting against said clamping frames whereby one of said guide bars is raised to allow the other bar to feed the cloth under the engaged clamping frame.

5. In a cloth piling machine, the combination of a carriage, motor means for propelling said carriage over a fixed path, a block vertically reciprocable on the front frame of the carriage and a block vertically reciprocal on the rear frame of the carriage, a pair of guide bars extending transversely across the carriage path and each having vertical slide bars at its ends vertically reciprocable in said blocks, bell crank levers pivoted at their elbows to said blocks and each having one arm pivoted to a slide bar, the other arms of said levers extending downwardly, a clamping frame at each end of the carriage path for coöperating with the guide bars to receive cloth therefrom, the downwardly extending arms of said bell crank levers abutting against said clamping frames whereby one of said guide bars and its slide bars are raised to allow the other guide bar to feed the cloth under the engaged clamping frame, and means for effecting vertical reciprocation of said blocks.

6. In a cloth piling machine, the combination of a carriage, motor means for propelling said carriage over a fixed path, a block vertically reciprocable on the front frame of the carriage and a block vertically reciprocal on the rear frame of the carriage, a pair of guide bars extending transversely across the carriage path and each having vertical slide bars at its ends vertically reciprocable in said blocks, bell crank levers pivoted at their elbows to said blocks and each having one arm pivoted to a slide bar, the other arms of said levers extending downwardly, a clamping frame at each end of the carriage path for coöperating with the guide bars to receive cloth therefrom, the downwardly extending arms of said bell crank levers abutting against said clamping frames whereby one of said guide bars and its slide bars are raised to allow the other guide bar to feed the cloth under the engaged clamping frame, and means controlled automatically by the height of the cloth pile on the carriage path for effecting vertical adjustment of said blocks.

7. In a cloth piling machine, the combination of a carriage, motor means for propelling said carriage over a fixed path, a block vertically reciprocable on the front frame of the carriage and a block vertically reciprocal on the rear frame of the carriage, a pair of guide bars extending transversely across the carriage path and each having vertical slide bars at its ends vertically reciprocable in said blocks, bell crank levers pivoted at their elbows to said blocks and each having one arm pivoted to a slide bar, the other arms of said levers extending downwardly, a clamping frame at each end of the carriage path for coöperating with the guide bars to receive cloth therefrom, the downwardly extending arms of said bell crank levers abutting against said clamping frames whereby one of said guide bars and its slide bars are raised to allow the other guide bar to feed the cloth under the engaged clamping frame, and means for effecting vertical adjustment of said blocks, and a pilot bar reciprocable on one of said guide bars and controlled by the height of the cloth pile on said carriage path to control said means.

8. In a cloth piling machine, the combination of a carriage, motor means for propelling said carriage over a fixed path, a block vertically reciprocable on the front frame of the carriage and a block vertically reciprocal on the rear frame of the carriage, a pair of guide bars extending transversely across the carriage path and each having vertical slide bars at its ends vertically reciprocable in said blocks, bell-crank

levers pivoted at their elbows to said blocks and each having one arm pivoted to a slide bar, the other arms of said levers extending downwardly, a clamping frame at each end of the carriage path for coöperating with the guide bars to receive cloth therefrom, the downwardly extending arms of said bell crank levers abutting against said clamping frames whereby one of said guide bars and its slide bars are raised to allow the other guide bar to feed the cloth under the engaged clamping frame, an actuating train between said carriage motor means and said blocks to effect vertical adjustment thereof, clutch mechanism in said train for determining the direction of adjustment of said blocks, a pilot bar vertically reciprocable on one of said guide bars to be free to follow the varying levels of the cloth pile on the carriage path, and lever mechanism connecting between said pilot bar and clutch mechanism whereby said clutch mechanism is adjusted to cause said actuating train to effect vertical adjustment of said blocks in accordance with the vertical movement of said pilot bar.

9. In a cloth piling machine, the combination of a carriage, motor mechanism for propelling said carriage back and forth over a fixed path, a block vertically reciprocable on the front frame of the carriage and a block vertically reciprocable on the rear frame of the carriage, a vertical screw shaft threading into each block, a gear on each screw shaft, a horizontal shaft having gears meshing with said screw shaft gears, clockwise and counter clockwise driving gears on said shaft, a clutch gear reciprocable on said horizontal shaft between said driving gears and adapted for clutch engagement therewith, means controlled by the level of the cloth on the carriage path for effecting reciprocation of said clutch gear whereby said blocks are correspondingly vertically adjusted, and guide bars supported from said blocks.

10. In a cloth piling machine, the combination of a carriage, motor mechanism for propelling said carriage back and forth over a fixed path, a block vertically reciprocable on the front frame of the carriage and a block vertically reciprocable on the rear frame of the carriage, a vertical screw shaft threading into each block, a gear on said screw shaft, a horizontal shaft having gears meshing with said screw shaft gears, clockwise and counter clockwise driving gears on said shaft, a clutch gear reciprocable on said horizontal shaft between said driving gears and adapted for clutch engagement therewith, guide bars supported from said blocks, a pilot bar vertically reciprocable on one of said guide bars to follow the varying levels of the cloth pile on the carriage path, and lever mechanism connecting said pilot bar and clutch gear whereby said clutch gear is adjusted to effect rotation of said horizontal shaft and screw shafts and vertical adjustment of said blocks and guide bars in correspondence with the vertical movements of said pilot bar.

11. In a cloth piling machine the combination of a reciprocating carriage, a main drive shaft, a motor driving said shaft, a rock lever connected with said main shaft to be rocked, gear teeth on said rock lever, a second shaft, gears on said second shaft, blocks vertically reciprocable on the front and rear frames of the carriage, screw shafts engaging said blocks, gears at the ends of said screw shafts engaging with said second shaft gears, forward and reverse drive gears on said second shaft, a clutch gear reciprocable on said second shaft between said drive gears and meshing with the teeth on said rock lever, guide bars supported from said blocks for guiding cloth, and lever mechanism controlled by the varying height of the piled cloth to shift said clutch gear alternately in driving relation with said drive gears whereby said blocks and guide bars are raised and lowered.

12. In a cloth piling machine, the combination of a carriage, a table on said carriage for supporting cloth to be piled, guide bars on said carriage, guide rollers on said carriage for guiding the cloth from the table to said guide bars, pulleys and an endless chain thereon running parallel to the path of the cloth from the table to the guide bars, hooks on said chain for receiving the cloth, and driving means for said chain, said hooks carrying the end of the cloth from the table and guiding it about its various guide rollers.

13. In a cloth piling machine the combination of a carriage, a table on said carriage for supporting cloth to be piled, guide bars on said carriage, guide rollers for guiding cloth from the table to the guide bars, a belt adjacent said guide rollers, driving means for said belt, and fastening members on said belt for receiving the end of the cloth to guide said cloth over the various guide rollers and to direct it to said guide bars.

In witness whereof, we have signed our names to this specification in the presence of two subscribing witnesses.

MORRIS L. SHAPERA.
CHARLES M. SHAPERA.

Witnesses:
EDW. R. NEUMANN,
M. J. MCKENDRY.