J. E. MILLER.

SEWING MACHINE.

APPLICATION FILED APR. 8, 1909.

1,009,165.

Patented Nov. 21, 1911.

6 SHEETS—SHEET 1.

Fig. 1.5.

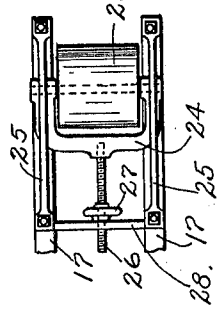


Fig. 1.

Fig. 2-a.

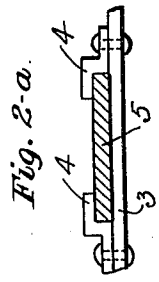


Fig. 2.

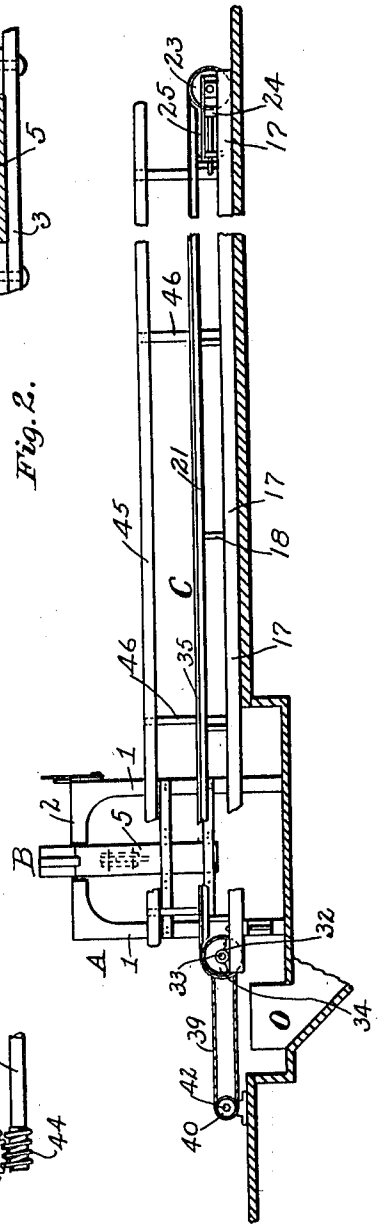
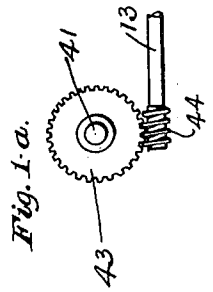


Fig. 1-a.



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6 SHEETS—SHEET 2.

Fig. 4.

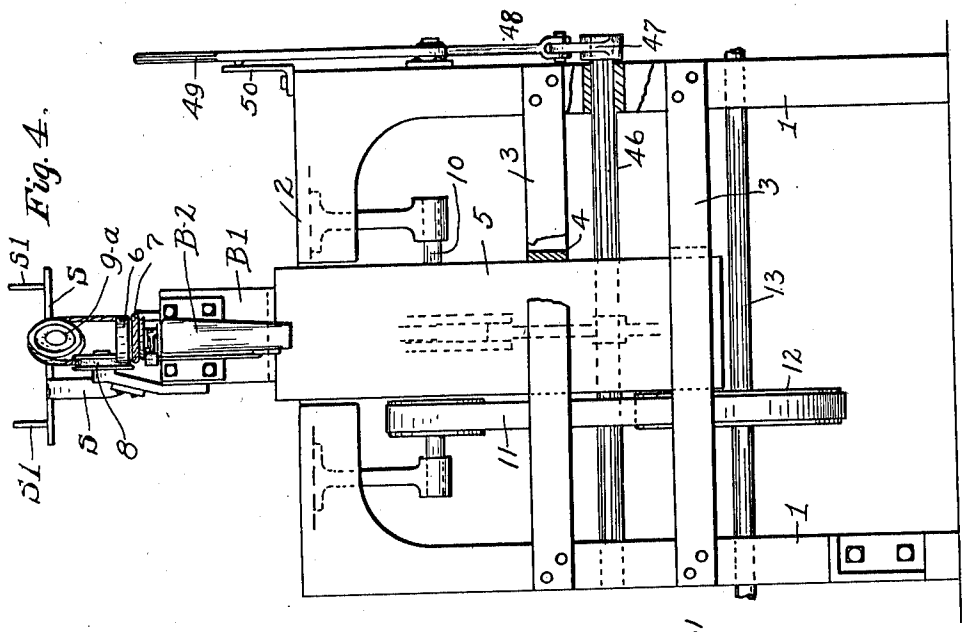
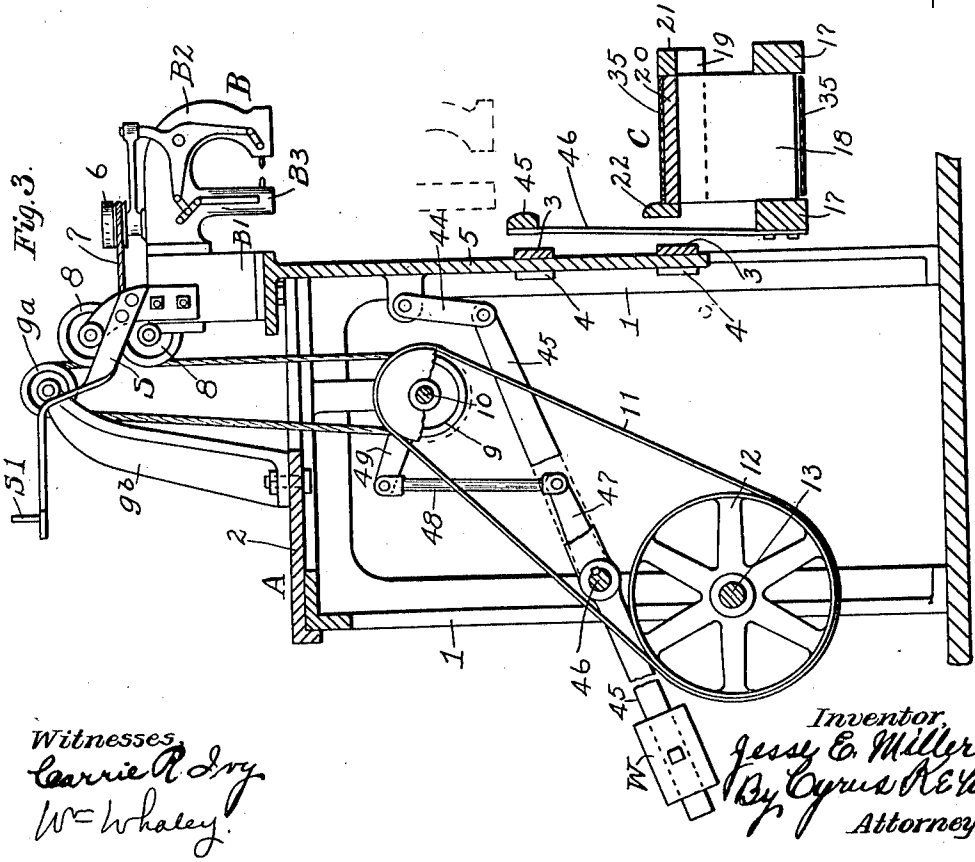


Fig. 3.



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6 SHEETS—SHEET 3.

Fig. 6.

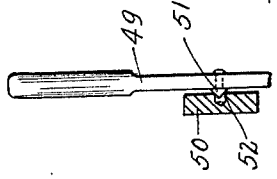


Fig. 13.

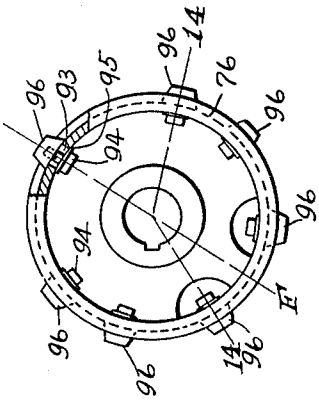


Fig. 14.

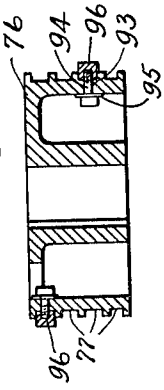
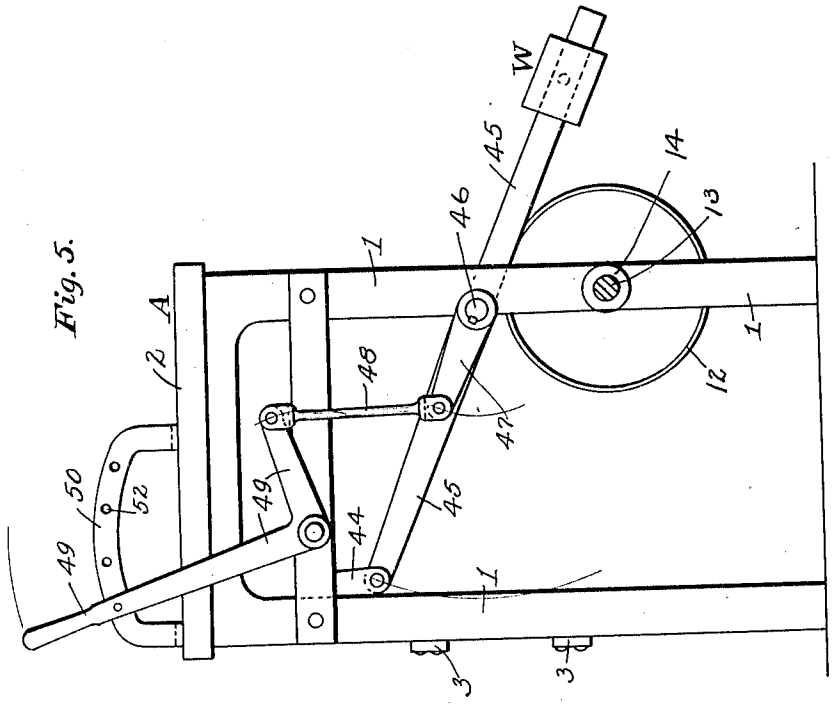


Fig. 5.



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6 SHEETS—SHEET 4.

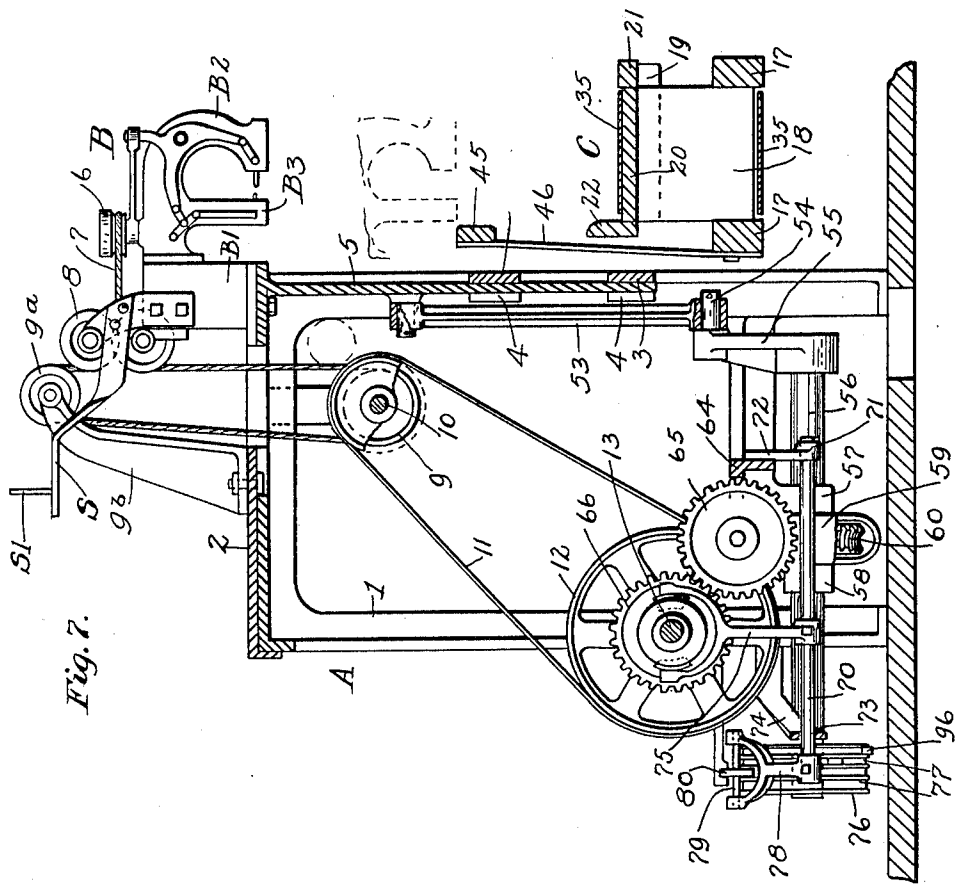

Fig. 7.

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6 SHEETS—SHEET 5.

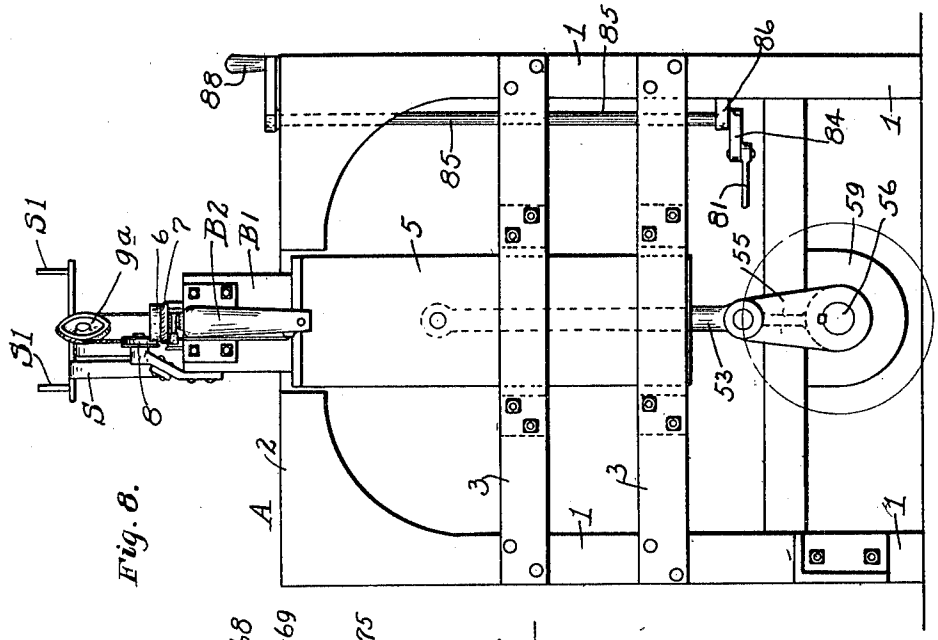

Fig. 8.

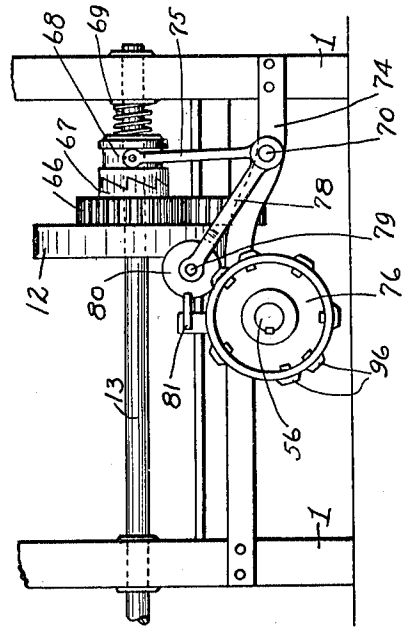

Fig. 10.

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6 SHEETS—SHEET 6.

Fig. 12.

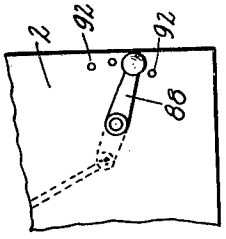


Fig. 11.

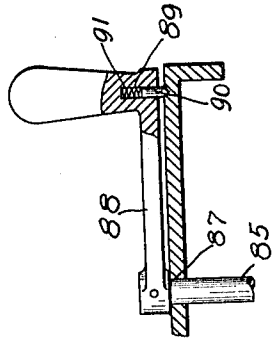
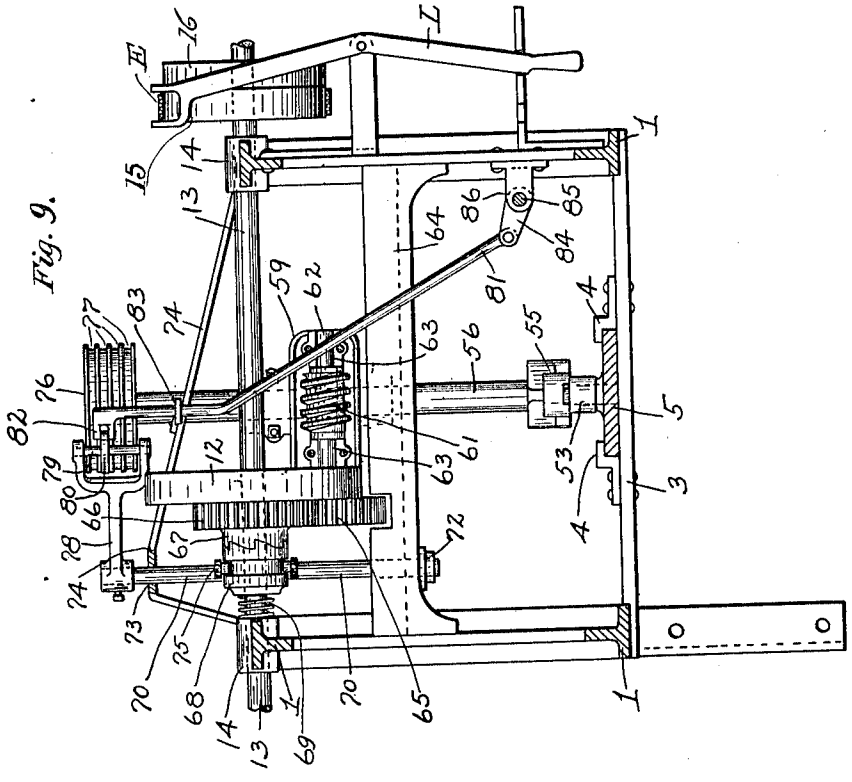


Fig. 9.



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UNITED STATES PATENT OFFICE.

JESSE E. MILLER, OF KNOXVILLE, TENNESSEE.

SEWING-MACHINE.

1,009,165. Specification of Letters Patent. Patented Nov. 21, 1911.

Application filed April 8, 1909. Serial No. 488,745.

To all whom it may concern:

Be it known that I, JESSE E. MILLER, a citizen of the United States, residing at Knoxville, in the county of Knox and State of Tennessee, have invented a new and useful Improvement in Sewing-Machines, of which the following is a specification, reference being had to the accompanying drawing.

My improvement relates particularly to sewing machines for closing filled bags, such bags being closed by sewing across the upper end instead of tying such end.

The object of the invention is to provide such sewing machines with a conveyer for filled bags and with sewing mechanism adapted to be quickly shifted according to variations in the height of the bags, in order that bags of varying sizes may be indiscriminately placed upon such conveyer and by the latter properly presented to the sewing head.

My improvement is herein illustrated and described in two forms. In the first of said forms, the sewing mechanism is shifted by hand, while in the second of said forms the sewing mechanism is shifted by power-driven mechanism controlled by the operator.

In the accompanying drawings, Figure 1 is a general plan of an apparatus embodying my improvement, portions being broken away; Fig. 1ª is a detail elevation of worm gearing shown in the left hand portion of Fig. 1; Fig. 2 is an upright section on the line 2—2 of Fig. 1, looking in the direction of the arrow; Fig. 2ª is a horizontal detail section in the middle portion of the sewing machine supporting frame shown in Fig. 2; Fig. 3 is a section on the line 3—3 of Fig. 1, looking toward the right, portions being omitted; Fig. 4 is a front elevation of the machine, portions being omitted; Fig. 5 is an elevation of the right hand side of the structure shown in Fig. 4, portions being omitted; Fig. 6 is a detail of the rack and lever shown in the upper part of Fig. 5; Fig. 7 is a section, similar to Fig. 3, of the form of the machine in which power-driven mechanism is used for changing the elevation of the sewing head; Fig. 8 is a front elevation of a portion of the structure shown by Fig. 7; Fig. 9 is a horizontal section on the line 9—9 of Fig. 7, portions being broken away; Fig. 10 is a rear elevation of the lower portion of the machine as shown in Fig. 9, portions being omitted; Fig. 11 is a sectional detail elevation of a controlling crank; Fig. 12 is a detail plan of the same crank; Fig. 13 is a detail elevation, partially in section, of a cam wheel; Fig. 14 is a section on the line 14—14 of Fig. 13; Fig. 15 is a detail of the conveyer.

By way of general description, it may be said that the apparatus illustrated by said drawings comprises (1) a frame-work supporting a sewing head set in position for sewing a fabric passing said head in an upright plane, (2) mechanism for driving the sewing mechanism, and (3) conveying mechanism extending from one or a plurality of bag-filling stations or machines to the sewing mechanism from which filling stations or machines filled bags of varying sizes are indiscriminately placed upon said conveying mechanism and by the latter carried to the sewing mechanism.

A designates the frame which adjustably supports the sewing head, B.

C represents the conveyer.

D, D, D are bag-filling stations or machines.

The frame, A, has four upright standards, 1; a horizontal table portion, 2; front horizontal pieces, 3, to which are applied guide pieces, 4, extending over the lateral edges of an upright reciprocatory member, 5, (Fig. 2ª). Upon the upper end of said member is mounted a head standard, B^1. Said standard supports the sewing head, B, having the depending outer arm, B^2, and inner arm, B^3, which correspond, respectively, to the ordinary upper and lower arm or base plate of ordinary forms of sewing machines.

For the driving of the sewing mechanism the usual band wheel, 6, on the sewing head, receives a band, 7, extending around said wheel and around two guide wheels, 8, on the head standard and around the wheel, 9, on the horizontal shaft, 10, located below the table, and around a wheel, 9^a, mounted on a standard, 9^b, rising from the table rearward of the wheels, 9, 9. Said shaft, 10, is driven by a belt, 11, from a band wheel, 12, on the horizontal power shaft, 13, mounted in bearings, 14, in the rear frame standards, 1, 1. On said shaft, 13, are a fixed pulley, 15, and a loose pulley, 16, to receive a power belt, E, arranged for shifting by a hand lever, L.

Upon the head standard, B^1, is a spool support, S, which has two upright spindles,

S[1], each adapted to enter a spool bearing thread to be used by the sewing mechanism. By thus mounting said spools, they will move up and down simultaneously with the sewing head, whereby the distance between said spools and said sewing head is maintained.

In the form shown in the drawings, said conveyer, C, is constructed as follows: Parallel horizontal base bars, 17, support standards, 18, which in turn support at their upper ends cross pieces, 19, upon which rest a middle relatively wide board, 20, a front strip, 21, and a rear rising strip, 22. At the foot end (the end the farther from the sewing mechanism) of the frame thus formed is a roller or band wheel, 23, having bearings in the sliding U-shaped yoke, 24, confined between the base bars, 17, and bars, 25, arranged parallel to said bars, 17. From said yoke, a screw-shaft, 26, extends through a nut, 27, which bears against the face of the cross-bar, 28, between said cross-bar and said wheel, 23, said cross-bar being secured to the base bars, 17. By turning said nut in the proper direction, said screw-shaft, yoke, and band wheel may be moved away from or toward the sewing mechanism. Upon the head ends of the bars, 17, are seated bearings, 32, in which is journaled the shaft, 33, of a band wheel, 34, which is of approximately the same size as the band wheel, 23, at the foot end of the conveyer. An endless conveyer belt, 35, extends the full length of said conveyer frame and around the band wheels, 23 and 34. Between said wheels the upper portion of said belt rests slidably upon the middle boards, 20, of the conveyer frame; and the lower portion of said belt extends between the base bars, 17, of said frame. The tension of said belt may be varied by shifting the wheel, 23, at the foot end of the conveyer. On the rear end of the shaft, 33, is a sprocket wheel, 38, which receives a sprocket chain, 39, which also surrounds a sprocket wheel, 40, on the horizontal shaft, 41, resting in bearings, 42. On said shaft is a worm gear wheel, 43, which is engaged by a worm, 44, on the power shaft, 13. A fender, 45, is supported above the rear portion of the conveyer frame by standards, 46, rising from the rear portion of said frame. The function of said fender is to support bags which lean rearward so far that they tend to fall. At the head end of the conveyer, there is a floor opening, O, for the passage of the sewed bags after they leave the conveyer.

To adapt the sewing head to sew bags of different heights while the latter stand upon the conveyer, the reciprocatory member, 5, is arranged to be set at different elevations, by means which will be next described, whereby the sewing head is correspondingly set at different elevations. An upright link, 44, is hinged by its upper end to the reciprocatory member, 5, and by its lower end to one end of a rocking lever, 45. Between its ends said lever, 45, is secured rigidly to a horizontal rock shaft, 46; and to the end of said lever opposite the end to which the link, 44, is hinged, said lever supports a counterweight, W, which is to approximately balance the reciprocatory member, 5, and the parts supported thereby.

At the right hand end of the frame, A, as viewed in Figs. 2 and 4, a rigid arm, 47, is secured to the rock shaft, 46; and to said arm is coupled the lower end of an approximately upright link, 48. The upper end of said link is hinged to one arm of a bell crank lever, 49, which is suitably hinged to the frame, A, in an upright plane. The other arm of said bell crank lever rises above the table, 2. On said table is a rack, 50, having four apertures, 52, to receive a short stud, 51, on the side of said lever. Said lever may be sprung slightly sidewise to release said stud from the apertures, 52.

As will be readily understood from the drawings, the reciprocatory member, 5, may be raised and lowered by rocking the bell crank lever, 49. One of the outer of said apertures, 52, is in proper position to engage the stud, 51, when the reciprocatory member is at one limit of its movement, while the other of the outer of said apertures is set in proper position to engage the stud, 51, when the reciprocatory member, 5, is at the other limit of its range of movement; and the two intermediate apertures, 52, are in proper positions to engage the stud, 51, when the reciprocatory member, 5, is at intermediate chosen positions. The positions and number of these apertures, 52, may be varied according to the elevations into which it is desired to place the sewing head.

In operation, bags are filled at any desired number of bag-filling stations or machines, D, and the bags are set upon the conveyer, C, at points on the latter most convenient to said stations. Said bags are set upon the conveyer with sufficient force to cause the flattening of their lower ends so as to form a base adapting the bags to stand upright without lateral support. In such position, each bag is carried toward the sewing head, and the attendant at said mechanism operates the bell crank lever, 49, for the raising or lowering of the reciprocatory member, 5, and the sewing head as may be necessary by variations in the height of the bags on the conveyer; and said attendant gives such assistance as may be necessary to the sewing operation, as, for example, the drawing of the mouth of the bag parallel to the line of travel and guiding said mouth between the arms of the sewing head. When the sewing head moves down, the two guide wheels, 8,

and the band wheel, 6, roll down on the band, 7; and when the sewing head moves upward, said wheels roll upward on said band. After passing said sewing head, the bags fall over the adjacent end of the conveyer and through the floor opening, O, upon any conveying mechanism adapted to convey said bags to places for storage or upon cars or wagons.

Referring now to Figs. 7 to 14, inclusive, I will describe the form of the machine embodying power-driven mechanism for changing the elevation of the sewing head. The conveyer, C, frame, A, sewing head, B, standard, B^1, reciprocatory member, 5, driving mechanism, etc., are the same as in the first form of the machine. A pitman, 53, is hinged by its upper end to the reciprocatory member, 5, and is joined by its lower end to a wrist, 54, of a crank, 55, mounted upon the front end of a shaft, 56, resting in bearings, 57 and 58, these bearings being at each side of a gear casing, 59. Between the bearings, 57, 58, and within the gear casing, 59, is a worm gear wheel, 60, surrounding said shaft, 56, and above said worm gear wheel is a worm, 61, on a horizontal shaft, 62, resting in bearings, 63, formed in part by the gear casing, 59. The portion of the gear casing above the shaft, 56, is cast integral with and thus supported by the horizontal frame member, 64. On one end of the shaft, 62, is a spur gear, 65, which meshes with another spur gear wheel, 66, loosely surrounding the shaft, 13, and embodying a clutch member, 67. Beside said spur gear wheel, 66, is a clutch member, 68, slidably surrounding said shaft, 13, and pressed toward said spur gear wheel, 66, by an expanding coiled spring, 69. Beneath the shaft, 13, is a transverse horizontal rock shaft, 70, resting in a bearing, 71, on a hanger, 72, and in a bearing, 73, formed in a bracket, 74, and from said rock shaft, 70, rises a forked arm, 75, engaging the clutch member, 68. And on the shaft, 56, is mounted a drum-form cam wheel, 76, having in its perimeter four grooves, 77. On the shaft, 70, is a rigid arm, 78, forked at its upper end and supporting a spindle, 79, within said fork. On said spindle, 79, is a small loose roller, 80, which may be shifted lengthwise upon said shaft by means of a shift rod, 81, having fingers, 82, at opposite sides of said roller, 80. Said shift rod extends through a bearing, 83, on the bracket, 74, and the opposite end of said shift rod is coupled to an arm, 84, on an upright rock shaft, 85, resting in a lower bearing, 86, and an upper bearing, 87, and having at its upper end, just above the table, 2, a hand crank, 88. In the lower portion of said hand crank is an upright aperture, 89, in which is a pin, 90, above which is an expanding coiled spring, 91, by which said pin is pressed downward to the table. In the table are four small, shallow recesses, 92, in which said pin may engage. The lower end of said pin is made obtusely conical so that it may readily slide out of said recesses when the crank is pressed laterally. Said pin, spring, and recesses constitute yielding stop mechanism by means of which said crank may be set in any one of four positions, whereby the small roller, 80, is brought above a corresponding groove, 77, in the cam wheel, 76. In each of said grooves on said cam wheel are apertures, 93. There are two such apertures in each of the first three of said grooves counting from the front and only one in the rear of said grooves. Through each such aperture extends a binding bolt, 94, bearing upon a washer, 95, and entering an oblong tooth or block, 96, having its base resting in the adjacent groove, said bolt being screw-threaded into said tooth. By this means, each such tooth is clamped in said groove by the one bolt, and the wall at each side of the groove prevents the lateral turning of the tooth. The radial distribution of said teeth bears a fixed relation to the crank, 55, which, as above described, is secured rigidly to the opposite end of the shaft, 56, which supports said cam wheel, 76. It is to be observed that the grooves, 77, are formed in said cam wheel merely for the purpose of facilitating the placing of the teeth or blocks, 96. And it is also to be observed that said cam wheel might be cast or otherwise formed having said teeth integral therewith. And it is to be observed further that said cam wheel is a multiple or complex cam having engaging extensions in four planes, the teeth, 96, being such extensions. And as a preliminary to the explanation of the operation of said compound cam, it is to be observed that each of said teeth is adapted to pass under the roller, 80, and raise the latter, and the arm, 78, and tilt the rock shaft, 70, and move the clutch arm, 75, and the clutch member, 68, away from the clutch member, 67, whereby the spur gear, 66, and the worm, 61, are put to rest. Thus the shaft, 56, the cam, 55, and the cam wheel, 76, cease to rotate. In other words, so long as the roller or wheel, 80, is not resting upon one of the teeth, 96, the clutch member, 68, is in engagement and the shaft, 56, and the cam wheel, 76, are in rotation; but as soon as one of said teeth passes beneath the roller, 80, said clutch is disengaged and the shaft, 56, and the parts thereto connected cease rotation and are bound or locked by the engagement between the worm, 61, and the worm gear wheel, 60. When the shaft, 56, is to be again set into motion for the turning of the crank, 55, into a new position, the clutch member, 68, is allowed to be pushed into

engagement by the spring, 69, by shifting the roller, 80, laterally until it slips off from the tooth, 96, upon which it then rests and bears upon the surface of the cam wheel, 76. The face of said roller is a little wider than the width of the grooves, 77, so that said roller does not enter said grooves. When said roller has been thus shifted, the shaft, 56, will continue to rotate until another tooth, 96, is forced beneath the roller, 80.

It will now be understood that the shaft, 56, and the crank, 55, may be stopped at any desired point by the proper placing of a tooth, 96, on the perimeter of the cam wheel, 76. For stopping said crank when it is turned to its lowest point (so that the crank pin is directly below said shaft) a tooth, 96, is so placed as to be between the shaft, 56, and the spindle, 79, of the roller, 80. For stopping the crank when it is in its highest position (when the crank pin is directly above the shaft, 56) another tooth is so placed as to stand between said shafts when said crank is above said shaft, 56. And in the same manner, a tooth, 96, may be set for stopping the crank in any other portion of its revolution. Provision may be made for stopping the crank in any number of positions. In the machine shown by the drawings, provision is made for four different elevations of the crank and crank pin, whereby the reciprocatory member, 5, may be put into any one of four elevations. And it is to be observed that the crank, 55, may be stopped at either side of the upright plane in which the shaft, 56, lies, and may be stopped at the same elevation at either side of said plane for putting the reciprocatory member, 5, to a chosen elevation between the highest and lowest elevations of said member. For the making of such stops of the crank at either side of said plane, a double number of teeth, 96, are placed upon the cam wheel, 76. The cam wheel illustrated by Figs. 13 and 14 of the drawings is formed for setting the crank, 55, into four positions, one of which is the lowest position of which the crank is capable and the other three of which are intermediate between such lowest and the highest position of which the crank is capable.

The line F—F of Fig. 13 coincides with a line extending through the spindle, 79, and shaft, 56, in Fig. 9; and the tooth, 96, in said line F—F in the upper portion of the wheel in Fig. 14, stands for the lowest position of which the crank, 55, is capable, and since there is only one such point on said crank, only one tooth, 96, can serve for such position. At each side of the tooth, 96, which is in said line F—F and equidistant from said tooth is another tooth, 96. Either of the two last mentioned teeth may be brought beneath the roller, 80, for the disengaging of the clutch member, 68, when the crank, 55, is turned into proper position for a certain elevation of the reciprocatory member, 5. A little farther from each side of the tooth in said line F—F and equi-distant from said tooth is another tooth, either of which is adapted for engagement beneath the roller, 80, for the disengaging of the clutch member, 68. And still farther away from each side of said tooth in said line F—F and equi-distant from said tooth is another tooth, 96, either of which may engage said roller, 80, for the disengaging of the clutch member, 68, for turning the crank into proper position for the lifting of the reciprocatory member, 5, to the desired height. The respective teeth, 96, for the four positions above noted are placed into distinct grooves in the cam wheel, 76, and the roller, 80, may be shifted into the plane of either of said grooves and the tooth or teeth applied to said grooves. Hence when it is desired that said roller shall be engaged by the tooth or teeth, 96, standing for any particular elevation of the crank, 55, the shift rod, 81, is moved endwise to bring said roller, 80, into such plane. The connection between said shift rod and the crank, 88, has already been explained. Each particular recess, 92, beneath said crank, 88, stands for one of said four planes or grooves of the cam wheel, 76, and said crank is shifted from one of said recesses to the other to bring the roller, 80, into the desired plane on said cam wheel, 76.

The operation is the same as in the first form of the machine, excepting that the hand crank, 88, is used in place of the bell crank lever, 49.

I claim as my invention:

1. In an apparatus of the nature described, a conveyer, a sewing head located above said conveyer, power-driven mechanism for changing the elevation of said sewing head, and mechanism controlled by the operator for controlling said power-driven mechanism.

2. In an apparatus of the nature described, a conveyer, an upright reciprocatory member, a sewing head supported by said reciprocatory member, power-driven mechanism for changing the elevation of said reciprocatory member, and mechanism controlled by the operator for controlling said power-driven mechanism.

3. In an apparatus of the nature described, a conveyer, a sewing head located above said conveyer, power-driven mechanism for changing the elevation of said sewing head, mechanism controlled by the operator for controlling said power-driven mechanism, and spool-supporting mechanism reciprocable in unison with said sewing head.

4. In an apparatus of the nature de-

scribed, a conveyer, an upright reciprocatory member, a sewing head supported by said reciprocatory member, power-driven mechanism for changing the elevation of said reciprocatory member, mechanism controlled by the operator for controlling said power-driven mechanism, and spool-supporting mechanism reciprocable in unison with said sewing head.

5. In an apparatus of the nature described, a conveyer, a sewing head located above said conveyer, power-driven mechanism for changing the elevation of said sewing head, and a shiftable member controlled by the operator and in operative relation with said power-driven mechanism for controlling the latter.

6. In an apparatus of the nature described, a conveyer, a sewing head located above said conveyer, power-driven mechanism for changing the elevation of said sewing head, and a crank controlled by the operator and in operative relation with said power-driven mechanism for controlling the latter.

7. In an apparatus of the nature described, a conveyer, a sewing head located above said conveyer, power-driven mechanism for changing the elevation of said sewing head, a shiftable member controlled by the operator and in operative relation with said power-driven mechanism for controlling the latter, and yielding stop mechanism for engaging said shiftable member in chosen positions.

8. In an apparatus of the nature described, a conveyer, a sewing head located above said conveyer, power-driven mechanism for changing the elevation of said sewing head, a crank controlled by the operator and in operative relation with said power-driven mechanism for controlling the latter, and yielding stop mechanism for engaging said crank in chosen positions.

9. In an apparatus of the nature described, a conveyer, a sewing head located above said conveyer, power-driven mechanism for changing the elevation of said sewing head, and clutch mechanism controlled by the operator for controlling said power-driven mechanism.

10. In an apparatus of the nature described, a conveyer, a sewing head located above said conveyer, mechanism for changing the elevation of said sewing head, clutch mechanism for transmitting power to said elevation-changing mechanism, a spring normally holding said clutch mechanism operative for the transmission of power, said elevation-changing mechanism comprising a multiple cam member in operative relation with said clutch mechanism for forcing the latter out of engagement, and mechanism controlled by the operator for changing the operative relations of said cam member.

In testimony whereof I have signed my name, in presence of two witnesses, this 5th day of April, in the year one thousand nine hundred and nine.

JESSE E. MILLER.

Witnesses:
CYRUS KEHR,
CARRIE R. IVY.