W. A. GIBBS.

MACHINE FOR ATTACHING FASTENERS TO CORDS.

APPLICATION FILED JUNE 15, 1916.

1,278,138.

Patented Sept. 10, 1918.

3 SHEETS—SHEET 1.

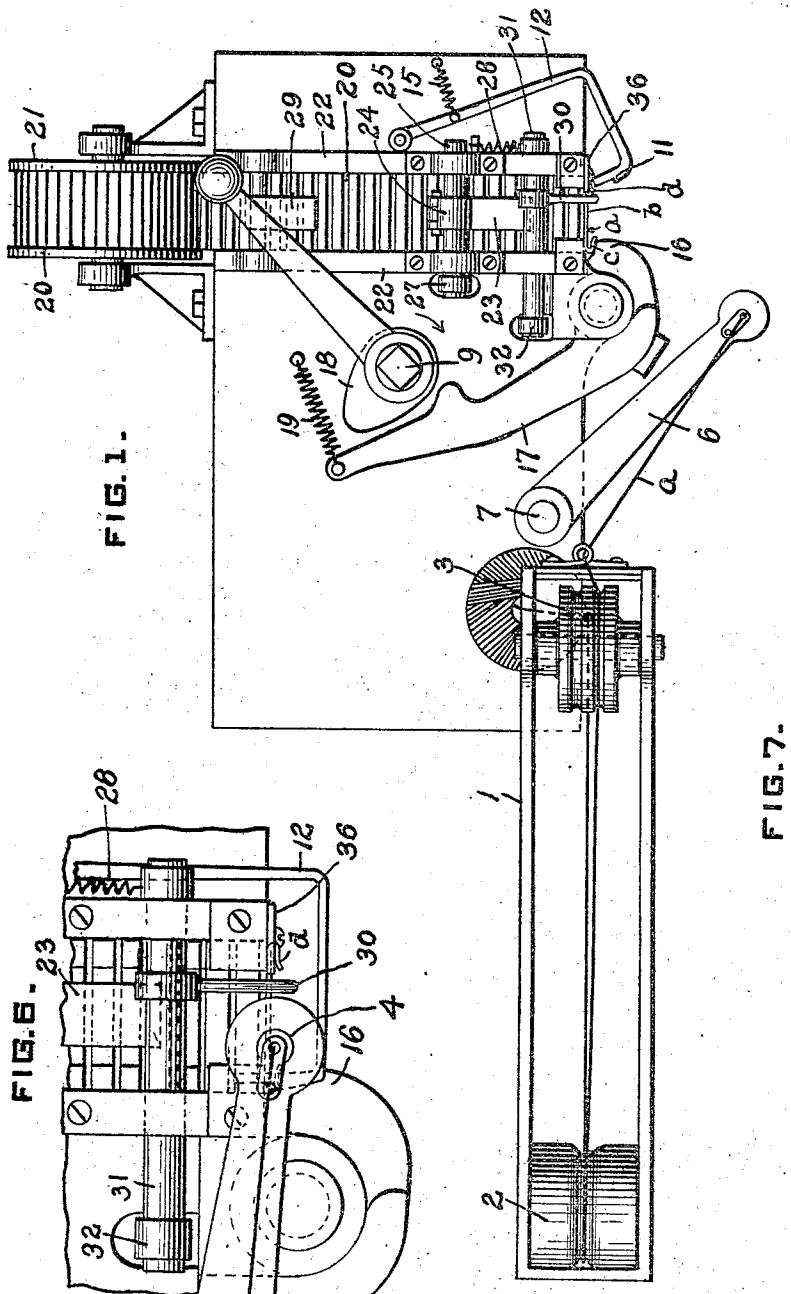


FIG. 1.

FIG. 6.

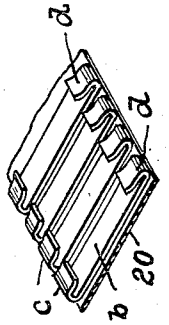


FIG. 7.

WITNESSES

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3 SHEETS—SHEET 2.

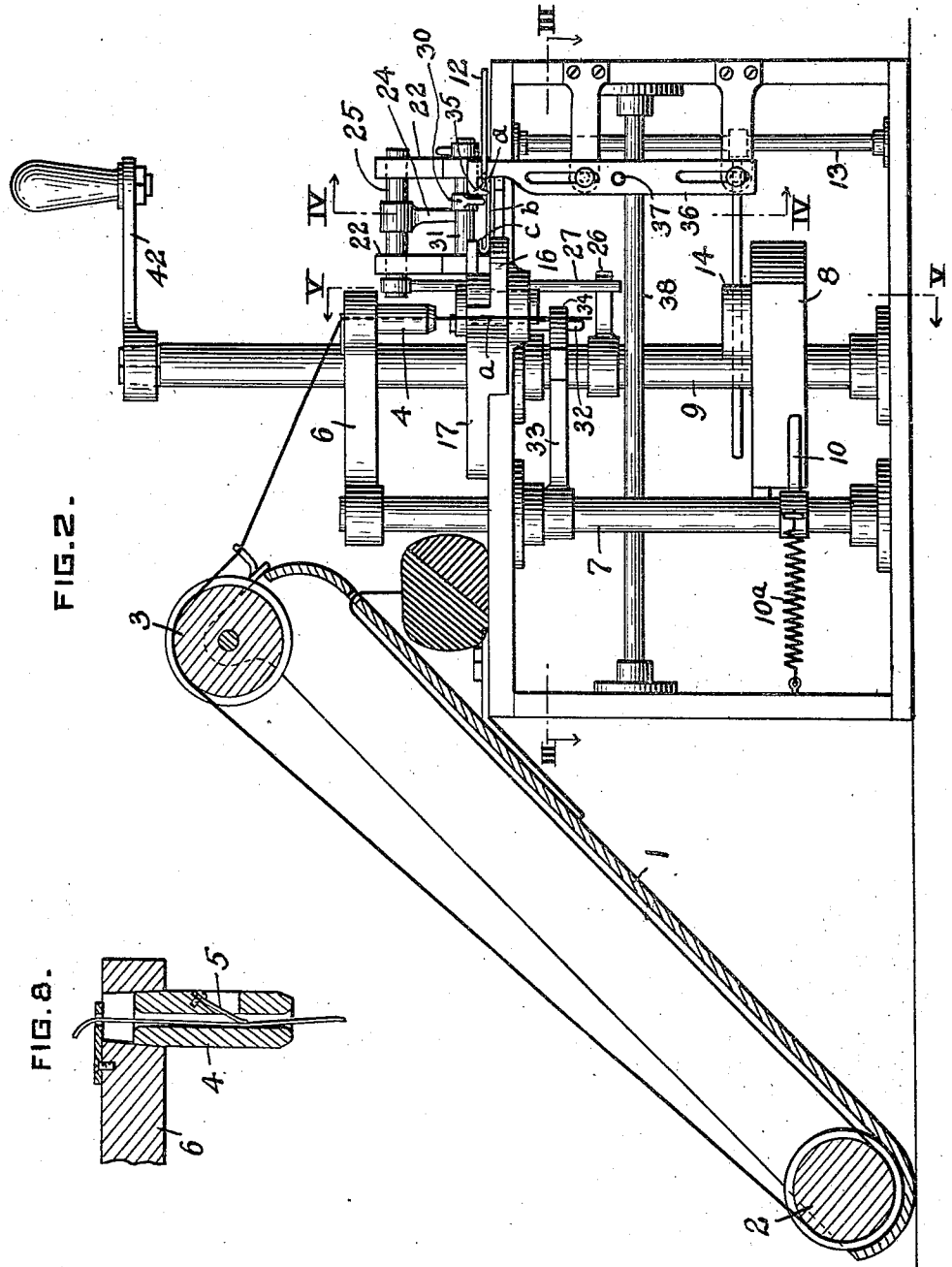


FIG. 2.

FIG. 8.

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3 SHEETS—SHEET 3.

FIG. 5.

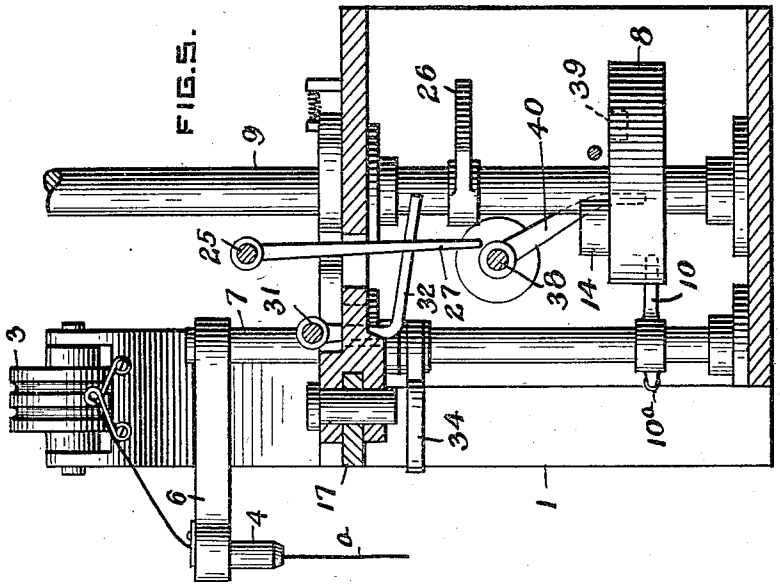


FIG. 3.

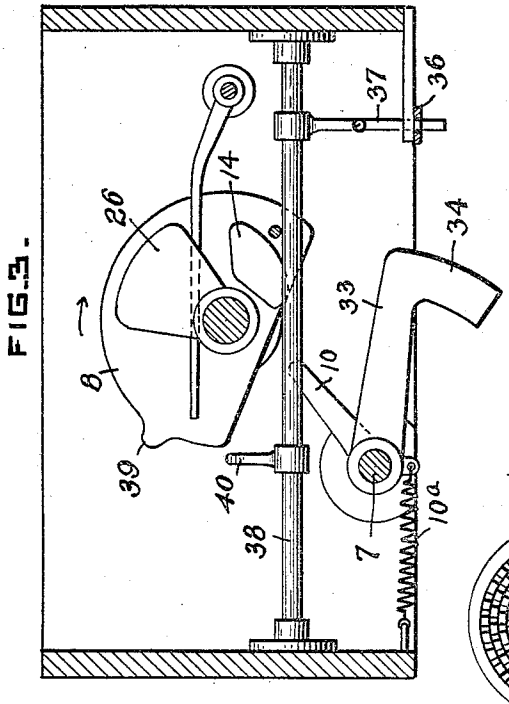
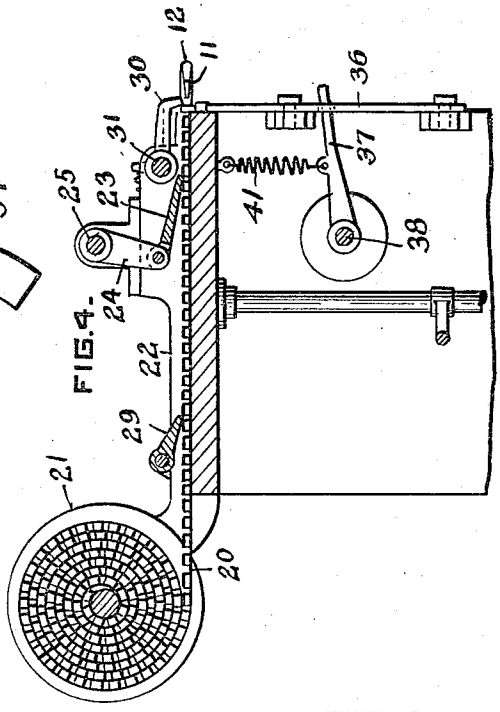


FIG. 4.



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UNITED STATES PATENT OFFICE.

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MACHINE FOR ATTACHING FASTENERS TO CORDS.

1,278,138. Specification of Letters Patent. Patented Sept. 10, 1918.

Application filed June 15, 1916. Serial No. 103,791.

To all whom it may concern:

Be it known that I, WALTER A. GIBBS, residing at Wilmington, in the county of New Castle and State of Delaware, a citizen of the United States, have invented or discovered certain new and useful Improvements in Machines for Attaching Fasteners to Cords, of which improvement the following is a specification.

The invention described herein relates to certain improvements in means for attaching a fastener to the free end of string extending from a ball or spool, so that a bundle of any size can be wrapped, and the string caused to engage the fastener and broken, the fastener secured to the end of the string being of a style or construction that the string which has been passed around a bundle can be caused to engage the fastener by a slight movement of the hand of the operator. The invention is hereinafter more fully described and claimed.

In the accompanying drawings forming a part of this specification, Figure 1 is a top plan view embodying my invention; Fig. 2 is a front elevation of the machine; Fig. 3 is a sectional plan view, the plane of section being indicated by the line III—III, Fig. 2; Figs. 4 and 5 are sectional elevations, the respective planes of section being indicated by the lines IV—IV and V—V Fig. 2; Fig. 6 is a detail view, showing the arm swung in placing the cord or string against the fastener, Fig. 7 is a perspective view showing fasteners separately connected together to facilitate their being fed into the machine, and Fig. 8 is a sectional detail view of the detent, employed for checking a backward movement of the string.

In the practice of the invention, a ball or spool of cord is supported in such a manner as to permit the cord being drawn therefrom. The cord is passed through suitable means whereby any excess cord drawn out from the machine in tying a package, may be drawn back so as to prevent waste of cord. A suitable means for such purpose consists of an inclined trough 1, secured to the frame of the machine or at any other suitable point. Within the trough is arranged a cylinder 2, preferably formed of metal and sufficiently heavy to pull on the portion of the cord extending to the machine, in rolling down the trough, which is merely a guide for the cylinder. The cord is passed around the cylinder and then partially around a guide pulley 3, loosely mounted at the upper end of the trough, or other form of guide for the cylinder. The free end of the cord is then passed through a guide adjacent to the outer end of the arm 6 and then through a block provided with a spring detent 5 to prevent the cord from being drawn back out of the block as shown in Fig. 8. This block is not attached to the arm 6 but is free to move away from the arm as the cord is pulled out in tying a bundle, as hereinafter described. The arm 6 is secured to a vertical shaft 7, adapted to be turned to bring the end *a* of the cord projecting from the block, into operative relation with a fastener as hereinafter described, by a cam 8 on the driven shaft 9, engaging an arm 10 on the shaft 7, as shown in Figs. 2, 3 and 5. The reverse movement of this shaft and the arm 6 to normal position, shown in Fig. 1, is effected by a spring 10^a. The inward movement of the arm 6 brings the portion *a* of the cord against a fastener *b*, as shown in Fig. 1. The portion *a* is then pushed into the open hook *c* of the fastener clearly shown in Fig. 7, by the finger 11 on the swinging arm 12 which is secured on the upper end of the vertical shaft 13. This shaft is turned in a direction to push the cord into the hook *c* by a projection 14 on the upper side of the cam disk 8, as shown in Figs. 2 and 3, the return movement of this shaft and the arm being effected by a spring 15. As soon as portion *a* of the cord has been pushed into the hook, the latter is closed onto the cord by the jaw 16 on the bent lever 17, which is mounted pivotally on the frame of the machine and shifted to close the hook by a cam 18 on the driven shaft 9. The lever is shifted to move the jaw 16 into open position by a spring 19.

While fasteners may be fed to the position where they are secured to the cord as shown and described, by any suitable means it is preferred that the fasteners be attached to strips of paper 20, or to other suitable material, and these strips with the attached fasteners wound on a spool 21 mounted in suitable bearings on the frame of the machine. The strips 20 extend from the spool between guides 22 to the point of attachment to the cord, the step by step movement of the strip being effected by a pawl 23 loosely mounted on an arm 24, carried by

the shaft 25. The shaft is turned to move the strip forward the width of a fastener by a cam 26 on the shaft 9, engaging an arm 27 on the shaft 25. The return movement of the shaft and pawls is effected by a spring 28, or the spring may be omitted if the arm be made of sufficient weight to effect such return movements. Any tendency of backward movement of the strip is prevented by a detent 29, as shown in Fig. 4.

Provision is made as the strip is moved horizontally for turning a fastener down to position to be attached to a cord. The feed of the strip will move a fastener beyond the edge of the table, and as soon as it reaches this position, and before the arm 6 is swung in as described, the unsupported fastener is turned down into vertical position against the edge of the top of the frame, by a bent finger 30 on the shaft 31, which has secured thereto a bent arm 32, extending into the path of movement of an arm 33 secured to shaft 7, and provided with a curved head 34. The arm 33 is so arranged on the shaft 7, relative to the arm 6, carrying the free end of the cord, that the head 34 will engage the bent arm 32 and thereby so move the finger 30 to turn a fastener down to position before the cord reaches the fastener as hereinbefore described.

After a fastener has been secured to the cord in the manner described, and the jaw 16 moved back, the fastener is removed from the strip by a hook 35 on a slide 36, as shown in Figs. 2 and 4. The downward or operative movement of the slide is effected by an arm 37 on the shaft 38 as shown in Fig. 4. The turning of the shaft to move the slide down is effected by a projection 39 on the periphery of the cam 8, engaging an arm 40 on the shaft 38, as shown in Figs. 3 and 5. The upward or return movement of the slide and its operating connection is effected by a spring 41.

It will be observed that the hook *d* on the fastener is so constructed as to permit the cord being drawn laterally into it, and when so drawn to firmly grip the cord. When it is desired to tie up a package, the shaft 9 is rotated by the crank arm 42, thereby swinging the arm 6, so as to bring a portion *a* of the cord in position against a fastener. The continued rotation of the shaft 9 will effect the attachment of a fastener to the cord, the separation of the fastener from its strip as hereinbefore described, and the outward movement of the arm 6 to normal position. The operator then grips the end *a*, having the fastener thereon and pulls out sufficient cord at the same time passing it around the bundle and finally draws the cord into the gripping hook *d*, and breaks the cord. In drawing the cord to tie a bundle, the block 4 will be drawn from the arm 6 and in the tying operation will be slid back along the cord. After the cord has been drawn into the hook of the fastener, the cord is broken between the fastener and the block.

When drawing out the cord, the cylinder will move up the trough toward the guide pulley, but as soon as the pull has ceased it will roll down to the lower end of the trough, pulling the cord back through the arm 6 until the block is drawn to position against the arm, as shown in Figs. 2 and 5. As before stated, the block 4 will be drawn from the arm as the cord is drawn out and will be pushed back along the cord as the latter is being wrapped around a bundle, so that the bundle will be adjacent to the end of the cord when broken after tying the bundle. The backward movement of the cord, due to the movement of the cylinder 2 down its trough will draw the block back up against the arm to position shown in Figs. 5 and 8. This construction insures that only a small portion or length of the cord will project from the block and its shifting arm, thereby preventing waste of the cord.

In case the cord is broken so close to the block that a sufficient length for the attachment of a fastener will not extend from the block, the operator can easily pull a sufficient length through the block.

I claim herein as my invention:

1. In a machine for applying fasteners to cord, the combination of a cord supply, means for carrying a portion of cord extending from such supply into operative relation to a fastener and means for securing such fastener at a single point only on the cord in proximity to the end thereof.

2. In a machine for applying fasteners to cord, the combination of a cord supply, means for carrying a portion of cord extending from such supply and a fastener into operative relation, one to the other, and means for securing the fastener at a single point only on the cord in proximity to the end thereof.

3. In a machine for applying fasteners to cord, the combination of a cord supply having a portion extending from such supply, means for bringing the fastener to a predetermined point, means for moving such free end of the cord into operative relation to the fastener and means for securing the fastener at a single point only on the cord in proximity to the end thereof.

4. In a machine for applying to a cord fasteners having two cord engaging means, means for bringing a cord and one of such cord engaging means of the fastener into operative relation, and means for causing such engaging means to grip the cord, leaving the other cord engaging means of the fastener free for engagement with another portion of the cord after being passed around a bundle.

5. In a machine for applying fasteners to

cord, the combination of a cord supply, and having a portion extending therefrom, a swinging arm having means for engaging such extended portion of the cord, means for supporting the fastener in the path of movement of the portion of the cord carried by the arm and means for causing a portion of the fastener to grip the single portion of the cord carried by the arm.

6. In a machine for supplying fasteners to cord, the combination of means for feeding fasteners, a swinging arm for moving a single portion of a cord against the fastener, means for shifting a single portion of a cord to a position to be gripped by a portion of the fastener, and means for causing the fastener to grip each single portion of the cord.

7. In a machine for applying fasteners to cord, the combination of means for feeding fasteners, means for shifting a fastener into position to be attached to a portion of a cord, means for bringing a single portion of the cord to positioned fastener, means for shifting the cord to position to be gripped by a portion of the fastener and means for causing the fastener to grip the single portion of the cord.

8. In a machine for applying fasteners to cord, the combination of a swinging arm, a block provided with means for preventing a backward movement of the cord relative thereto, means for applying a backward pull to the cord, thereby bringing the block to position on the arm and means for applying a fastener to the portion of the cord extending from the block.

In testimony whereof, I have hereunto set my hand.

WALTER A. GIBBS.

Witnesses:
ALFRED WHARTENBY,
THEODORE W. FRANCIS.

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