

A. M. BATES.
BAG TYING MACHINE.
APPLICATION FILED MAR. 15, 1912.

1,151,752.

Patented Aug. 31, 1915.

2 SHEETS—SHEET 1.

Fig. 1.

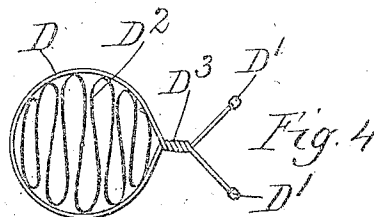
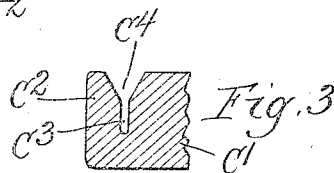
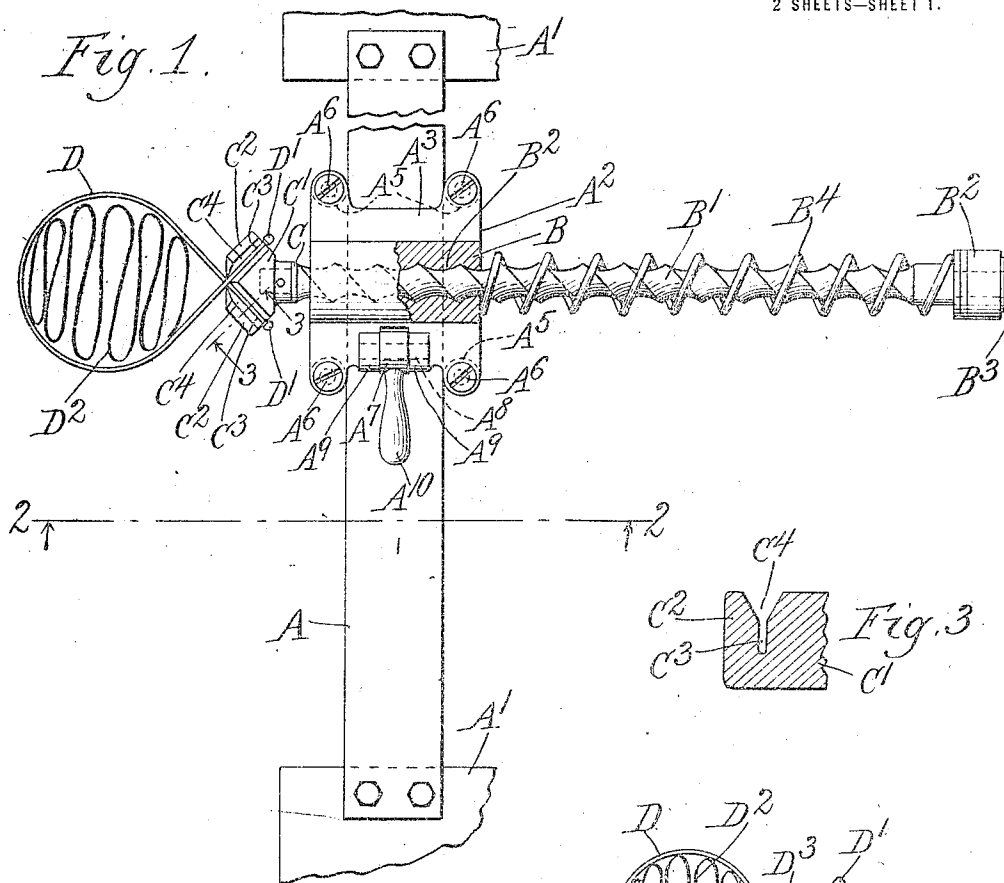
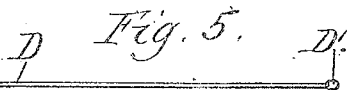
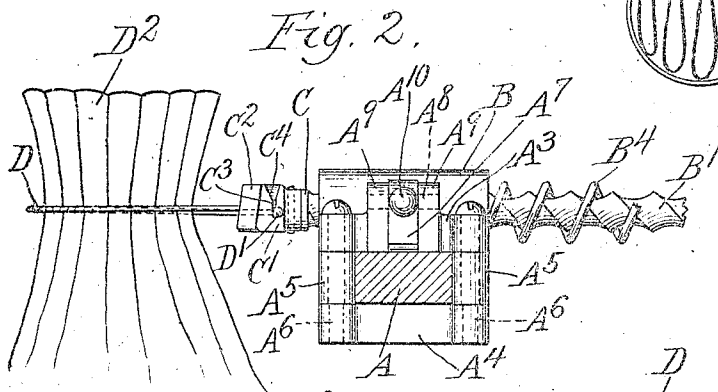


Fig. 2.



Witnesses.

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2 SHEETS—SHEET 2

Fig. 6.

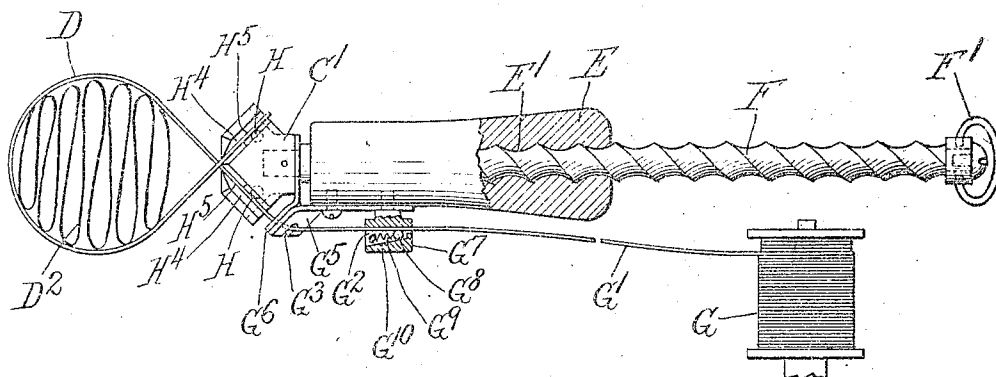
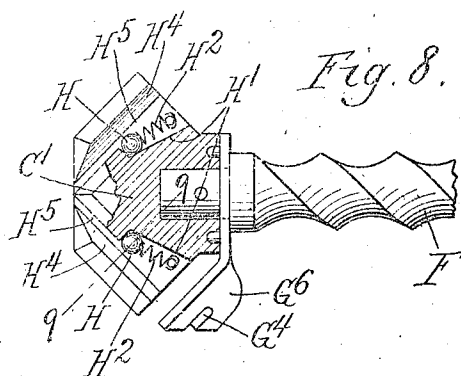
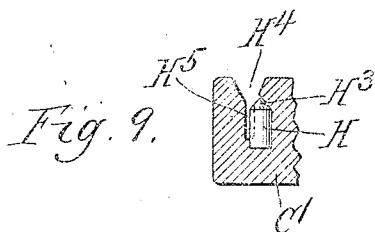
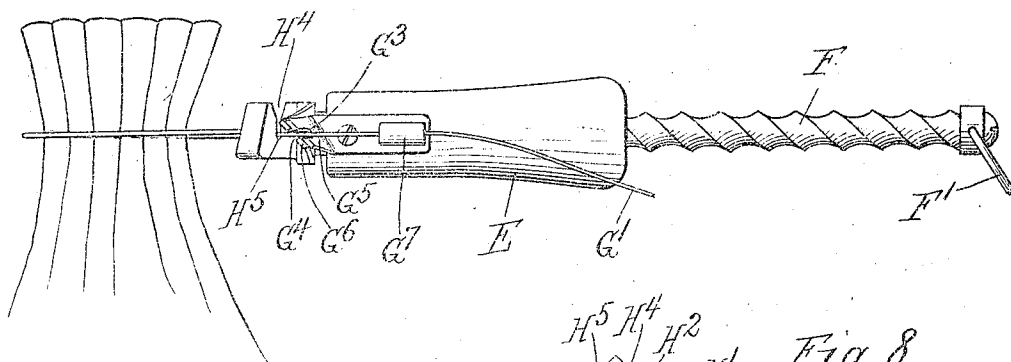


Fig. 7.



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UNITED STATES PATENT OFFICE.

ADELMER M. BATES, OF CHICAGO, ILLINOIS, ASSIGNOR TO BATES VALVE BAG COMPANY, OF CHICAGO, ILLINOIS, A CORPORATION OF WEST VIRGINIA.

BAG-TYING MACHINE.

1,151,752.

Specification of Letters Patent.

Patented Aug. 31, 1915.

Application filed March 15, 1912. Serial No. 353,912.

To all whom it may concern:

Be it known that I, ADELMER M. BATES, a citizen of the United States, residing at Chicago, in the county of Cook and State of Illinois, have invented a certain new and useful Improvement in Bag-Tying Machines, of which the following is a specification.

My invention relates to improvements in bag tying machines adapted to twist a wire about the neck of a bag.

It is illustrated diagrammatically in one form in the accompanying drawing, wherein—

Figure 1 is a plan view; Fig. 2 a section along the line 2—2 of Fig. 1; Fig. 3 a section along the line 3—3 of Fig. 1; Fig. 4 a plan view showing the neck of the bag with the wire tie twisted about it; Fig. 5 a detailed view of the wire tie; Fig. 6 a plan view of a modified form, partly sectional; Fig. 7 a side elevation of the modified form shown in Fig. 6; Fig. 8 a plan view of the head of said modification on a larger scale, with parts broken away; Fig. 9 a section along the line 9—9 of Fig. 8.

Like parts are indicated by like letters throughout the several figures.

The transverse bar A is mounted on the supports A¹ in a suitable frame. The carriage A² is made up of the plates A³, A⁴ separated by the vertical rollers A⁵ on the pins A⁶ which connect the plates. The carriage is thus slidably mounted on the bar A and is held in any desired position thereon by the eccentric cam A⁷ mounted on the transverse pin A⁸ which is journaled in the lugs A⁹ on the plate A³. The handle A¹⁰, connected to the cam, may be employed to shift the carriage back and forth upon the bar and to lock it in position.

B is a semi-cylindrical boss on the upper surface of the plate A³ and it contains the spirally-threaded screw rod B¹ which travels in a threaded bore in the inside of the boss. The outer end of the rod is provided with a head B² held in position by a screw B³ and the rod is surrounded by the spiral spring B⁴ which bears at one end against the boss and at the other against the head B². The spring tends to draw the spiral rod out and keep it in the position indicated in Fig. 1.

C is a collar on the other end of the bar B¹ to limit its outward motion and C¹ is a head mounted on the collar C and provided with the two projecting lips C², C³ in which are the inclined grooves C⁴ widening along their upper surfaces into the inclined side pockets C⁵. The central lines of the groove C⁴ intersect at a point in line with the axis of the rod B¹ so that when the opposed ends of the tie-loop D are placed in the pockets C⁵ they conveniently drop into the slot C⁶ in such manner that the wires cross each other at their intersection with the axis of the bar B¹. The tie D, which is preferably provided with the upset ends D¹, is carried around the crimped neck of the bag D² in such manner that they cross and the upset ends rest against the inner surfaces of the twisting head and the two ends of the tie are then twisted by the rotation of the rod B¹ to form the twisted portion D³ which completes the tie and tightens it about the bag. Where the wire is not provided with the upset ends, these ends should be forced down against the body of the bag so as to prevent injury to the user.

The hand device or modification shown in Figs. 6 to 9 inclusive consists of the handle E with the slot E¹ adapted to receive the spiral rod F at the outer end of which is the ring F¹ which serves as a handle whereby the screw may be conveniently supported if desired to permit the head E to turn by the force of gravity to the opposed end of the screw and also acts as a handle whereby the whole device may be supported or hung up or attached to the operator's belt as the case may be. The rod F carries a head like that shown in Fig. 1.

G is a spool located as desired from which leads the wire G¹ through the guide-eye G² on the handle. Thence the wire passes through slots G³, G⁴ in the jaws G⁵, G⁶ on the handle E and head C¹ respectively. These jaws are parallel one to the other but inclined to the axis of rotation of the rod in such manner that when the rod and head rotate with respect one to the other and are longitudinally separated, the two jaws slide one upon the other in a spiral plane corresponding to the spiral path of the jaw G⁶ as it travels with the head. This movement

causes the wire to be sheared off by the two jaws as they slide one upon the other and it is held against withdrawal from the handle by the clamp G⁷ made up of the locking ball G⁸ held in the spring G⁹ against the cam surfaces G¹⁰ and the wire G¹.

When the tie is to be used without the upset ends, it is held against movement in the head by the pins H in opposition to the inclined cam surface H¹ and wedged between this surface and the wire by the spring H². These pins have the conical heads H³ in opposition to the inclined wall of the opening H⁴ whereby the wire may be forced downwardly into the slot H⁵ in a direction parallel with the axis of the pins and a forward movement of or tension on the wire will tend to wedge the pins against the wire and thus hold it against any displacement. This wedging action, however, will not resist an upward movement of the wire and, therefore, the finished tie may be freed from the head by forcing the head slightly inwardly to free the tension on the pins and tipping the head with respect to the wire tie.

The crossing of the two ends of the tie at the point where the twist is to be made is in the axis of the screw rod and this greatly reduces the effort involved in twisting. The heading up of the ends of the wire may be done in any desired manner, but I show no apparatus for that purpose. The various advantages and purposes of the invention will be readily understood from the description and drawings.

The arrangement whereby the ends of the wire are crossed before the twisting action takes place locates the point at which the twisting starts, and in the arrangement shown this twisting starts first at a point immediately adjacent the twisting head and progresses toward the bag. Therefore, the twisting may be continued as long as desired and its sole function is to cause the twisted area to extend toward the bag and constrict it and, therefore, there is no limit placed upon the number of turns which may be made. It will be understood that this is important, in view of the fact that when the wires are twisted from a position of parallelism the cross is made at some point between the head and the bag and the twist extends both ways and is limited at one end by the rigid head.

It will be understood that my illustrations are more or less diagrammatic, although they show an operative machine, but they are intended to suggest a general form of structure rather than to set forth fixed details. A very considerable departure as to size, proportion and arrangement of parts can be made without departing from the spirit of my invention.

The use and operation of my invention are as follows:—Referring first to the fixed tying

machine, the arrangement is such that the machine may be moved back and forth along an extended platform so as to be brought to any desired position and shifted from time to time to accommodate itself to other conditions. The tie wire, assuming that it is a severed piece with upset ends is carried around the crimped end of the bag and the two ends dropped into position in their respective slots. Here they are held by the heads and the longitudinal motion of the rod rotates it so as to twist the tie and apply it to the bag as indicated in Fig. 4. In this arrangement of device the rod moves longitudinally, but in the arrangement shown in Fig. 6 it is the handle or carriage which moves. In this latter case I have shown the slots as provided with clamping devices so that the wire may be clamped in position and thus be held in its slot preliminary to the twisting without the necessity of having the ends of the wires upset. Moreover, this arrangement permits a flexible or varying length of wire, as only so much wire as is necessary is placed around the object to be tied and this might be a variable amount. In such case the wire must be severed by the cutter. Of course, the wire is in this event fed from any desired source and I have not shown the means for mounting the spool which contains it. Obviously this arrangement for supplying the wire and clamp or clamps in the twisted head and the cutter could either or all of them be applied to the device as shown in Fig. 1 as well as the device shown in Fig. 6.

The manipulation of the device of Fig. 1 is as follows:—When a bag is to be tied the neck of the bag is first roughly surrounded by the bag tie in such manner that the free ends of the tie cross on the side of the neck adjacent the twisting device. The opposed free ends are then dropped into the pockets in the twisting head and thence into the grooves therein. The operator then seizes the bag both above and below the point at which it is in contact with the wire tie and pulls out thus drawing the spiral grooved rod through the lug on the carriage. The spiral grooves on the lug and on the carriage cause the rod to twist carrying with it the wire tie. The twisting starts at the point at which the free ends of the wire tie intersect and comparatively little force is required to twist the wire since the first turn, which is of course the most difficult one, is made before any tension is placed upon the wire. The heads on the free ends of the tie prevent the wire from drawing through the twisting head. When the wire has been twisted the operator releases the pull on the bag, disengaging the wire tie and the spring draws the twisting head back into its original position. The manipulation of the device as shown in Fig. 6 is substantially the

same except that here the handle is moved, the movable end of the rod resting against the operator or some fixed object.

I claim:

1. A bag tying machine, comprising a slotted twisting head, means including the walls of the slots and independent of the shape of the tie ends for receiving and holding the ends of the tie and for preventing longitudinal movement of the tie there-
through, and means for rotating the head to twist the tie on the bag, the slots being of constant width throughout their entire effective length.

2. A bag tying machine, comprising a slotted twisting head, means including the walls of the slots for receiving and holding the ends of the tie and for preventing longitudinal movement of the tie therethrough, and means for rotating the head to twist the tie on the bag, said head being mounted on a screw-threaded shaft, the rotating means comprising a fixed nut in screw-threaded engagement with said shaft.

3. A bag tying machine, comprising a slotted twisting head, said head having a plurality of slots on the same side thereof, the walls of which are parallel, of substantially the same width as the diameter of the tie to be held, and of constant width throughout their entire effective length, means for rotating the head to twist the tie on the bag, and means including the walls of said slots for preventing longitudinal movement of the tie therethrough.

4. A bag tying machine, comprising a slotted twisting head, means including the walls of the slots for receiving and holding the ends of the tie and for preventing longitudinal movement of the tie there-

through, and means for rotating the head to twist the tie on the bag, said slots being inclined one to the other and intersecting at their forward ends.

5. A bag tying machine, comprising a slotted twisting head, means including the walls of the slots for receiving and holding the ends of the tie, means for rotating the head to twist the tie on the bag, and means responsive to the rotation of the head for cutting off the tie.

6. A bag tying machine, comprising a slotted twisting head, means including the walls of the slots for receiving and holding the ends of the tie and for preventing longitudinal movement of the tie therethrough, means for rotating the head to twist the tie on the bag, and means responsive to the rotation of the head for cutting off the tie.

7. A bag tying machine, comprising a slotted twisting head, means including the walls of the slots for receiving and holding the ends of the bag tie and preventing longitudinal movement of the tie therethrough, a cut-off means interposed between the wire supply and the twisting head, and means responsive to the rotation of the twisting head for cutting off the wire.

8. A bag tying machine, comprising a twisting head, means for feeding wire thereto to form the bag tie, and means responsive to the rotation of the twisting head for cutting off the bag-tie wire in suitable bag-tie lengths.

Signed at Chicago, Illinois, this 2nd day of March, 1912.

ADELMER M. BATES.

Witnesses:

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MINNIE M. LINDEMAR.