No. 759,339. PATENTED MAY 10, 1904.

W. P. BLISS.

BROOM WINDING MACHINE.

APPLICATION FILED OCT. 29, 1903.

NO MODEL. 3 SHEETS—SHEET 1.

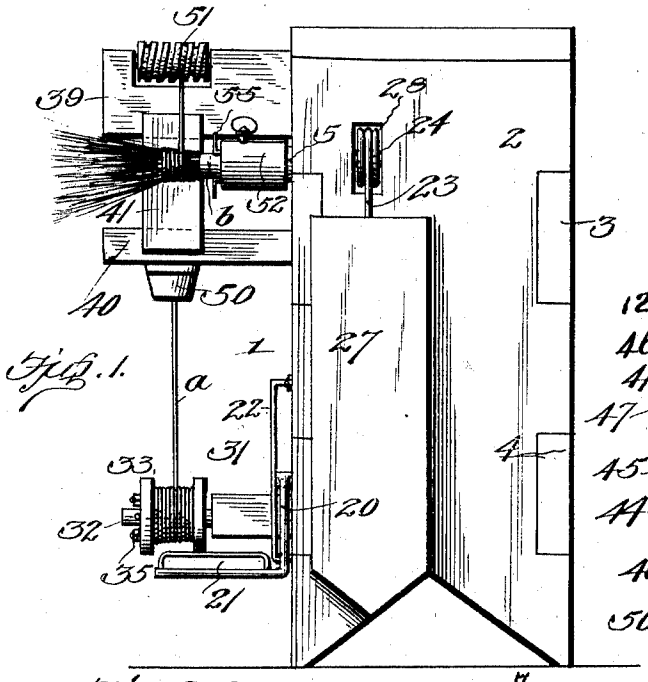

Fig. 1.

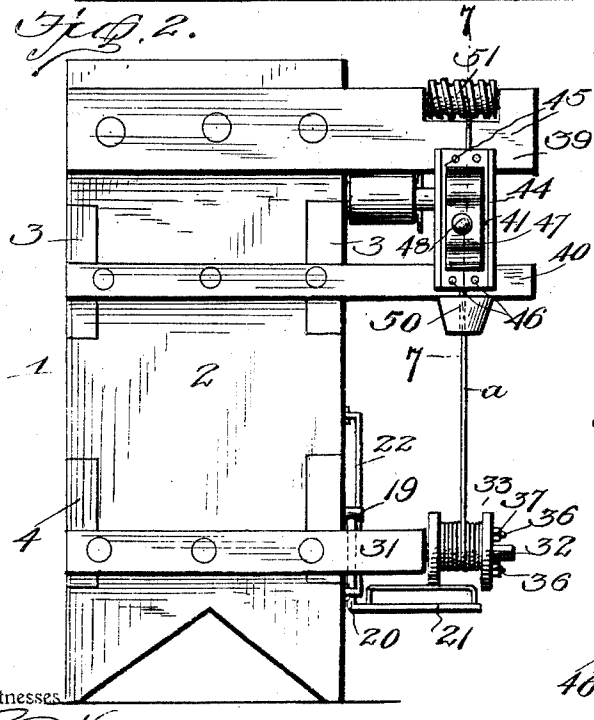

Fig. 2.

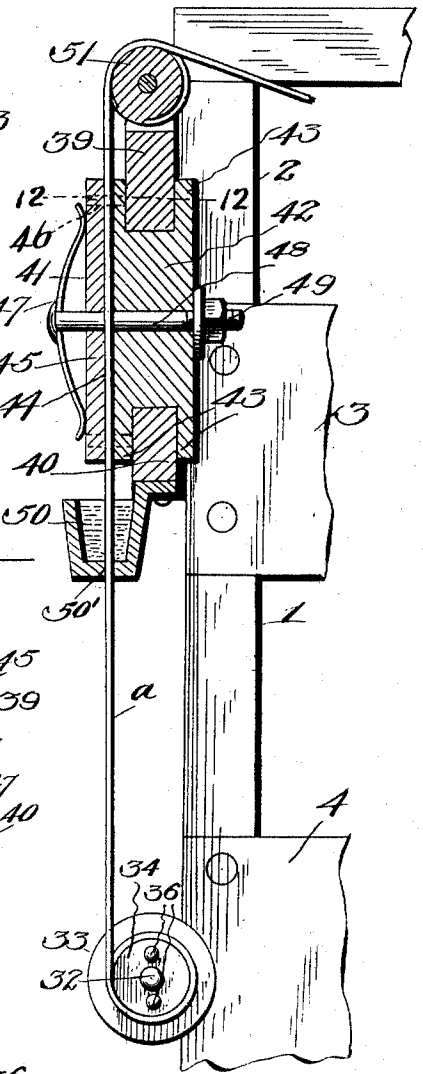

Fig. 7.

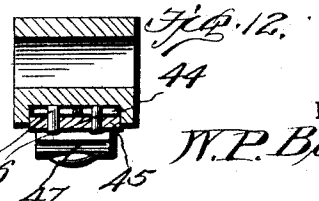

Fig. 12.

Witnesses

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NO MODEL. 3 SHEETS—SHEET 2.

Fig. 3.

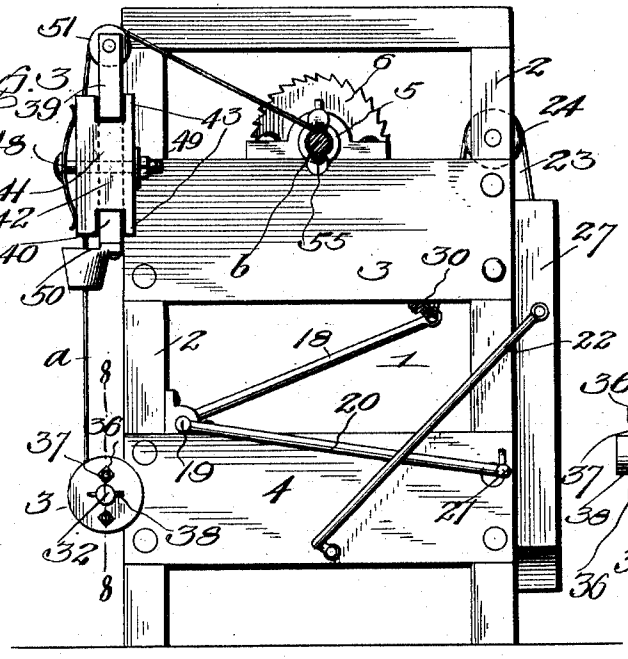


Fig. 8.

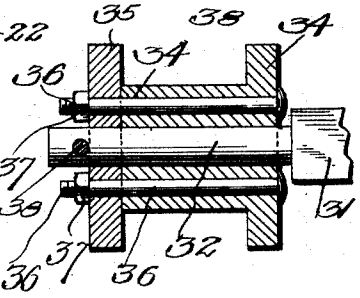


Fig. 4.

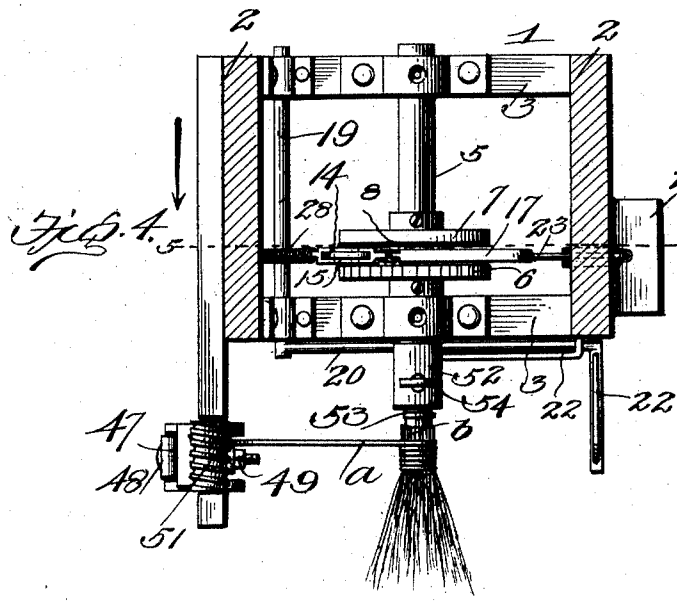
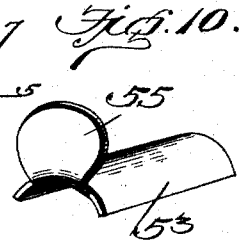


Fig. 10.



Witnesses

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No. 759,339. PATENTED MAY 10, 1904.

W. P. BLISS.

BROOM WINDING MACHINE.

APPLICATION FILED OCT. 29, 1903.

NO MODEL. 3 SHEETS—SHEET 3.

Fig. 5.

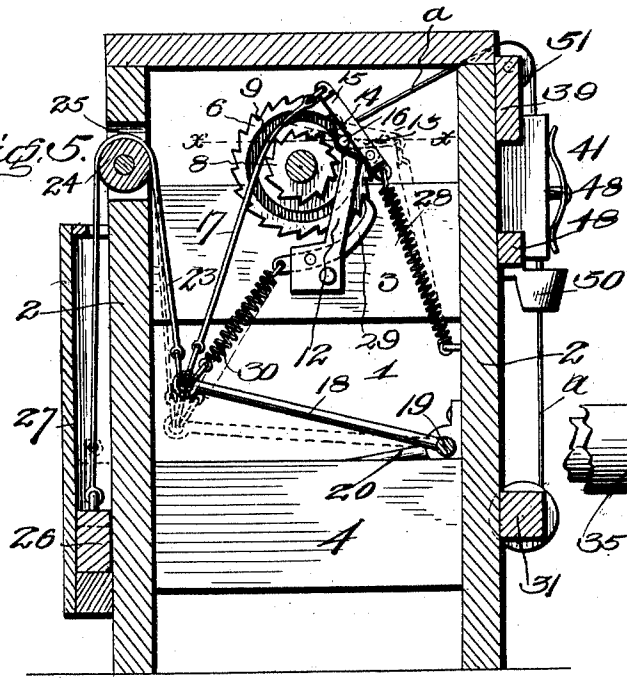


Fig. 11.

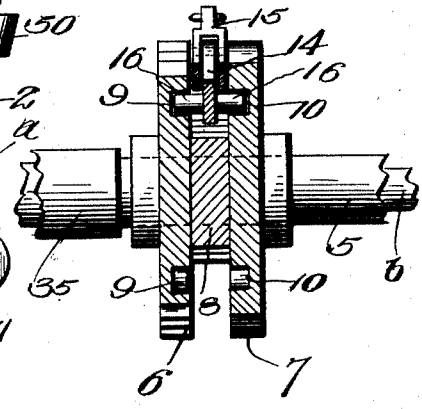


Fig. 6.

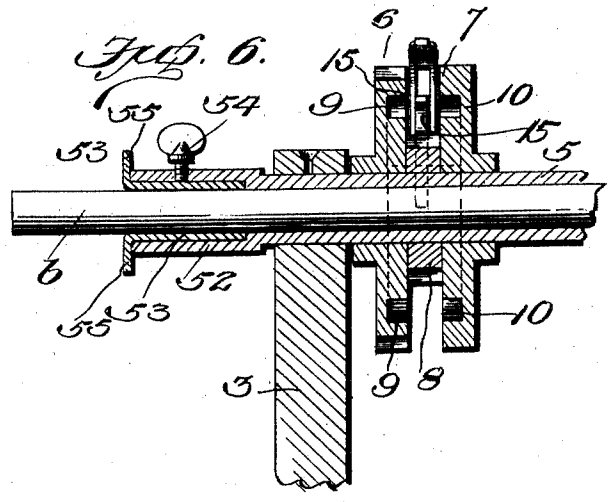
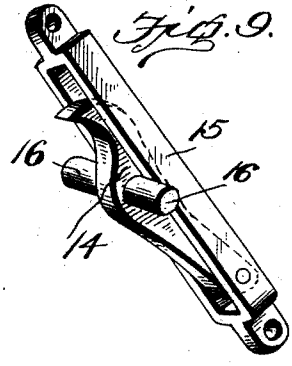


Fig. 9.



Witnesses

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No. 759,339. Patented May 10, 1904.

UNITED STATES PATENT OFFICE.

WILLIAM P. BLISS, OF AURORA SPRINGS, MISSOURI.

BROOM-WINDING MACHINE.

SPECIFICATION forming part of Letters Patent No. 759,339, dated May 10, 1904.

Application filed October 29, 1903. Serial No. 179,087. (No model.)

To all whom it may concern:

Be it known that I, WILLIAM P. BLISS, a citizen of the United States, residing at Aurora Springs, in the county of Miller and State of Missouri, have invented certain new and useful Improvements in Broom-Winding Machines; and I do declare the following to be a full, clear, and exact description of the invention, such as will enable others skilled in the art to which it appertains to make and use the same.

This invention relates to improvements in machines for winding brooms.

The object of the invention is to provide a machine of this character by which a broom may be tightly and evenly wrapped and tied, means being provided whereby a retrograde movement of the broom-holding device is prevented.

Another object is to improve the tension device so that a tight wire will always be had, a further object being to provide means for oiling the wire before the same is wrapped, thereby preventing the same from becoming rusty.

With these and other objects in view the invention consists of certain novel features of construction, combination, and arrangement of parts, as will be more fully described, and particularly pointed out in the appended claims.

In the accompanying drawings, Figure 1 is an elevation of one side of the machine. Fig. 2 is a similar view of the opposite side. Fig. 3 is an end elevation. Fig. 4 is a top plan view partly in section. Fig. 5 is a vertical cross-sectional view on the line 5 5 of Fig. 4 looking in the direction of the arrow. Fig. 6 is a vertical longitudinal section taken on a line with and through the broom-holder. Fig. 7 is a detail vertical section on line 7 7 of Fig. 2 through the tension device, the oil-cup, and the spiral wire-guide. Fig. 8 is a detail sectional view on line 8 8 of Fig. 3 of the wire-holding spool or reel. Fig. 9 is a detail view of the operating-pawl and the parts immediately connected therewith. Fig. 10 is a detail perspective view of one of the broom-handle-clamping plates. Fig. 11 is a horizontal sectional view of the ratchet mechanism, taken on line x x of Fig. 5. Fig. 12 is a detail horizontal section through the tension device on line 12 12 of Fig. 7.

Referring to the drawings more particularly, 1 denotes a supporting-frame consisting of vertical sides or standards 2, connected at their front and rear edges by upper and lower cross-bars 3 and 4. A longitudinally-disposed hollow shaft 5 is journaled in bearings formed on the upper cross-bars 3 about midway between the sides 2. On said shaft are fixed a large ratchet-wheel 6, and spaced therefrom and arranged paralled therewith is a circular disk 7 of substantially the same size as said ratchet-wheel and which is also fixed to the shaft 5. Between the ratchet-wheel 6 and the disk 7 is arranged a smaller ratchet-wheel 8. On the inner face of the ratchet-wheel 6 is formed an annular groove or channel 9, the diameter of which is slightly greater than that of the ratchet-wheel 8. On the adjacent inner face of the disk 7 is formed an annular groove or channel 10, which corresponds in size and arrangement with the groove 9 in wheel 6.

An arm 12 is fixed to the inner side of one of the cross-pieces 3 and projects upwardly between the wheel 6 and disk 7 and is beveled on its upper end, as shown at 13. An operating-pawl 14 is normally supported upon said beveled end, one end of said pawl being pivotally connected to a slotted bar 15, which is arranged between said disk 7 and wheel 6. Near its opposite or engaging end the pawl 14 is provided with laterally-projecting studs 16, which are adapted to engage the annular grooves 9 and 10, which are formed in the adjacent inner faces of the wheel 6 and disk 7. The upper end of the bar 15 is connected to one end of an operating cord or strap 17, the opposite end of which is connected to an arm or lever 18, which is secured to and projects at right angles from a longitudinally-disposed operating-shaft 19, which is journaled in suitable bearings on the lower cross-pieces 4. On the end of said operating-bar is fixed a right-angularly projecting lever 20, which is provided on its free end with a treadle 21. The

lever 20 is held in position and guided by an inclined rod or bar 22, connected to the end of the frame 1.

A cord or chain 23 is connected at one end to the free end of the arm or lever 18 and passes over a pulley 24, journaled in a slot 25, formed in one side of the machine, and is connected at its opposite end with a weight 26, which is held in position and guided in its movements by an inclosed casing 27. This weight raises the arm 18 and treadle-lever 20 after they have been depressed in the operation of the machine.

The opposite end of the slotted bar 15 from that to which the operating cord or strap 17 is attached is connected to the upper end of a coiled spring 28, the lower end of which is connected to the inner side of one of the standards 2 of the frame. The operating end of the pawl 14 is adapted to be brought into engagement with the teeth of the ratchet-wheel 8 to turn the same by a downward pull of the cord or strap 17, which rocks the bar 15 against the tension of the spring 28, and upon releasing the pull on the strap 17 said spring will restore the bar 15 and pawl 14 to their normal positions on the beveled end of the arm 12.

A retaining-pawl 29 is pivotally connected to the arm 12, one end of the same being normally held in engagement with the teeth of the ratchet-wheel 6 by means of a coiled spring 30, one end of which is connected to the opposite end of the pawl 29, and the opposite end is connected to the arm or lever 18. This pawl is to prevent retrograde movement of the broom-holding shaft.

Projecting forwardly from one side of the machine is a bracket-arm 31, on the outer end of which is formed a spindle 32, on which is mounted to turn a wire-holding spool or reel 33, consisting of a cylindrical body portion 34, having on one end an integral head 34′ and at its opposite end a removable head 35. The end of the body portion 34 adjacent to the removable head is provided with short stub-bolts 36, which project therefrom and are adapted to pass through holes formed in the removable head 35 and to receive nuts 37, whereby said head is secured upon the spool. When it becomes necessary to place a new coil of wire upon the spool or reel, the nuts 37 are screwed off the bolts and the head 35 removed. The coil of wire may now be slipped upon the body of the reel and the head 35 replaced. The spool or reel may be held on the spindle 32 in any suitable manner. In the present instance a pin 38 is shown passed through a hole in the end of the spindle.

Above the bracket-arm 31 are arranged similar brackets 39 and 40, which are spaced apart, as shown, and between the same is slidably mounted a tension device 41, which consists of a block 42, on the upper and lower ends of which are formed parallel upwardly and downwardly projecting ears or lugs 43, which engage the brackets 39 and 40 and slidingly hold the tension-block thereon. On the outer side of the block is formed a vertically-disposed channel 44, in which is arranged a plate 45. At the upper and lower ends of said channel are formed pairs of outwardly-projecting guide-pins 46, which enter holes provided therefor in the ends of the plate 45. A bowed spring 47 is arranged on the outer side of said plate 45, and through the center of the spring, the plate, and the tension-block is passed a headed bolt 48, the head of which bears against the bowed portion of said spring and on the opposite end of which is screwed a nut 49 and washer, which bear against the side of the tension-block. The tension of the spring 47 is regulated by screwing or unscrewing the nut 49. The wire *a* from the spool or reel is passed upwardly beneath the plate 45 and is clamped thereby more or less tightly against the wall of the channel 44, the pressure of the plate 45 upon the wire being regulated by the tension of the spring 47, which is controlled by the bolt and nut 48 and 49, thereby always insuring a taut wire. The sliding connection of the tension-block with the brackets 39 and 40 gives a straight pull to the wire at all times.

Secured to the bracket 40 beneath the tension device is an oil or grease cup 50, having in its bottom a centrally-disposed hole 50′, which is just large enough to permit the wire *a* to pass through the same after leaving the spool and before passing through the tension device. The passage of the wire through this cup, which contains suitable oil or grease, will oil the same, thereby allowing it to pass smoothly through the tension device, and will also prevent the wire from becoming rusty.

In the bracket 39 above the tension-block is journaled a spirally-grooved wire-guiding roller 51, over which and in said spiral groove passes the wire *a* and from which the wire passes to the end of the broom-handle *b*, upon which the straws are being secured. The spiral groove in the roller 51 causes the wire to be fed along and evenly wrapped on the straws of the broom-head, and the retaining-pawl prevents any backward turning of said head, thereby insuring a tightly and uniformly wound broom.

On the outer end of the hollow shaft 5 is formed a socket 52, in which are inserted segmental clamping-plates 53, one of which may be fixed to the inner wall of the socket and the other of which is loosely inserted in said socket. These clamping-plates are arranged at opposite sides of the broom-handles, against which they are clamped by a set-screw 54, which is screwed through one side of the socket 52 and engages the loose wear-plate, forcing the same against the broom-handle and firmly clamping said handle between the same and the opposite clamping-plate, as shown in Fig. 6. The outer ends of the plates 53 may

be provided with angularly-bent finger-pieces 55, by which they may be manipulated.

The operation of the machine is as follows: A broom-handle to be wrapped is inserted in the socket 52 and through the hollow shaft to the proper position. The set-screw 54 is now tightened against the movable clamping-plate, which will firmly hold the handle in place. The formation of the broom-head is now begun by securing the end of the wire to the handle and holding in place some of the straws. The foot-lever is actuated, which will rotate the hollow shaft and the broom-handle by the ratchet mechanism hereinbefore described. The rotation of these parts causes the wire to be wrapped around the ends of the straws, thereby securing the same on the end of the handle, the tension device causing the wire to tightly bind the straws together on the handle, while the spirally-grooved roller directs the movement of the wire evenly across or along the straws, as will be understood. The retaining-pawl 29 will prevent a retrograde movement of the broom-head by reason of its being normally engaged with the ratchet-wheel 6 by the spring 30, which is also connected to the arm or lever 18. Should it be desired, however, to turn the parts backward for any reason, the treadle-lever may be slightly raised above its normal position, which will also raise the arm or lever 18, thereby releasing the tension of the spring 30 on the pawl 29 and allowing it to drop out of engagement with the ratchet-wheel 6, which will permit the parts to be turned backward. When the parts are turned backward, as just described, for any purpose, the tension device will hold the wire from the spool taut, thereby preventing the same from becoming tangled or loose on the spool.

From the foregoing description, taken in connection with the accompanying drawings, the construction and operation of the invention will be readily understood without requiring a more extended explanation.

Various changes in the form, proportion, and the minor details of construction may be resorted to without departing from the principle or sacrificing any of the advantages of this invention.

Having thus described my invention, what I claim as new, and desire to secure by Letters Patent, is—

1. In a broom-winding machine, a hollow broom-holding shaft, and broom-engaging clamps at the end of the shaft endwise insertible and withdrawable within and from said shaft.

2. In a broom-winding machine, the combination with a hollow broom-holding shaft, broom-clamping devices arranged within an end of the shaft, said clamping devices having projecting finger-pieces to facilitate their adjustment, substantially as described.

3. In a broom-winding machine, the combination with a rotary broom-holder, of a spirally-grooved wire-guide, a wire-holding reel, and a sliding tension device between the guide and reel.

4. In a broom-winding machine, the combination with a wire-holding reel, a rotary broom-holder, and a guide adapted to impart back-and-forth movement to the wire as it winds about the material on the holder, of a sliding tension device provided with means for exerting variable pressure on the feeding wire.

5. In a broom-winding machine, the combination of a hollow broom-holding shaft, a disk on said shaft, ratchet-wheels of different diameters on said shaft, said disk and one of said ratchet-wheels being provided with grooves, a slotted bar, a pawl pivoted to said slotted bar, provided with trunnions fitting in said grooves and adapted to engage the smaller ratchet-wheel to rotate the shaft in a forward direction, a second pawl to engage the larger ratchet-wheel to hold the shaft against retrograde movement, a spring connected to one end of the slotted bar, and an operating-lever connected to the opposite end of said slotted bar, substantially as described.

6. In a broom-winding machine, the combination with a supporting-frame, of a rotary broom-winding shaft, ratchet mechanism embodying a supporting element, an operating-pawl supported upon said element, a floating bar to which the pawl is pivoted, a spring connecting one end of said bar to the frame, an operating-lever, and a connection between the operating-lever and other end of the bar, substantially as described.

7. In a broom-winding machine, the combination with a supporting-frame, of a broom-winding shaft, ratchet mechanism controlling the operation of the same, said ratchet mechanism comprising an operating-pawl, a gravity-retracted detent-pawl, an operating-lever, and connections between the operating-lever and the pawls, the connection between said lever and the detent-pawl being adapted to yield to allow said lever to be projected while the pawl is in engaging position and to allow said lever to be adjusted beyond its normal retracted position to allow the pawl to become automatically retracted, substantially as described.

In testimony whereof I have hereunto set my hand in presence of two subscribing witnesses.

WILLIAM P. BLISS.

Witnesses:
JOSEPH R. LAWSON,
WILLIAM M. LUMPKIN.