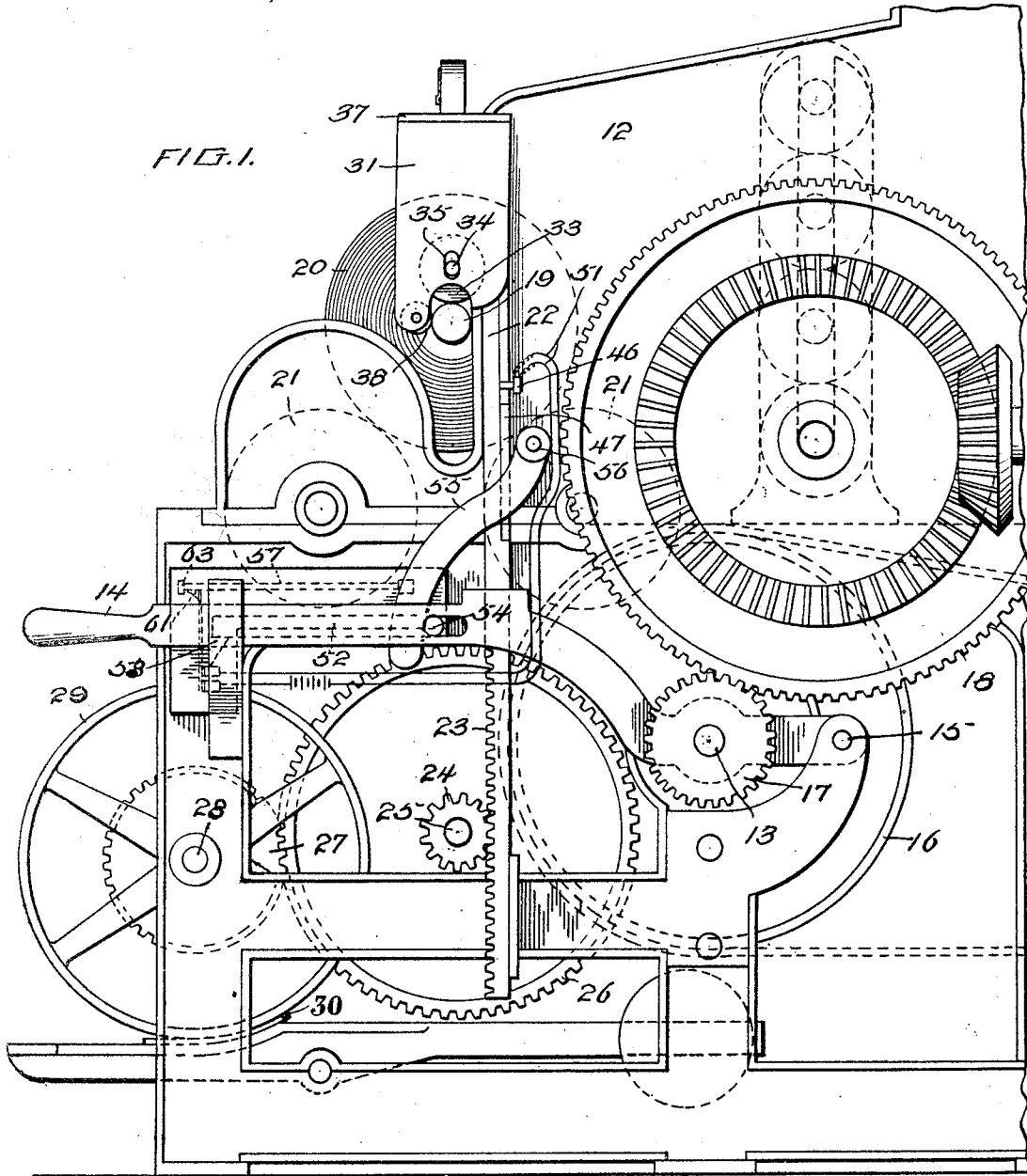


B. M. ROGERS.
LAPPING MACHINE.
APPLICATION FILED MAY 1, 1911.

1,037,327.

Patented Sept. 3, 1912.

3 SHEETS—SHEET 1.



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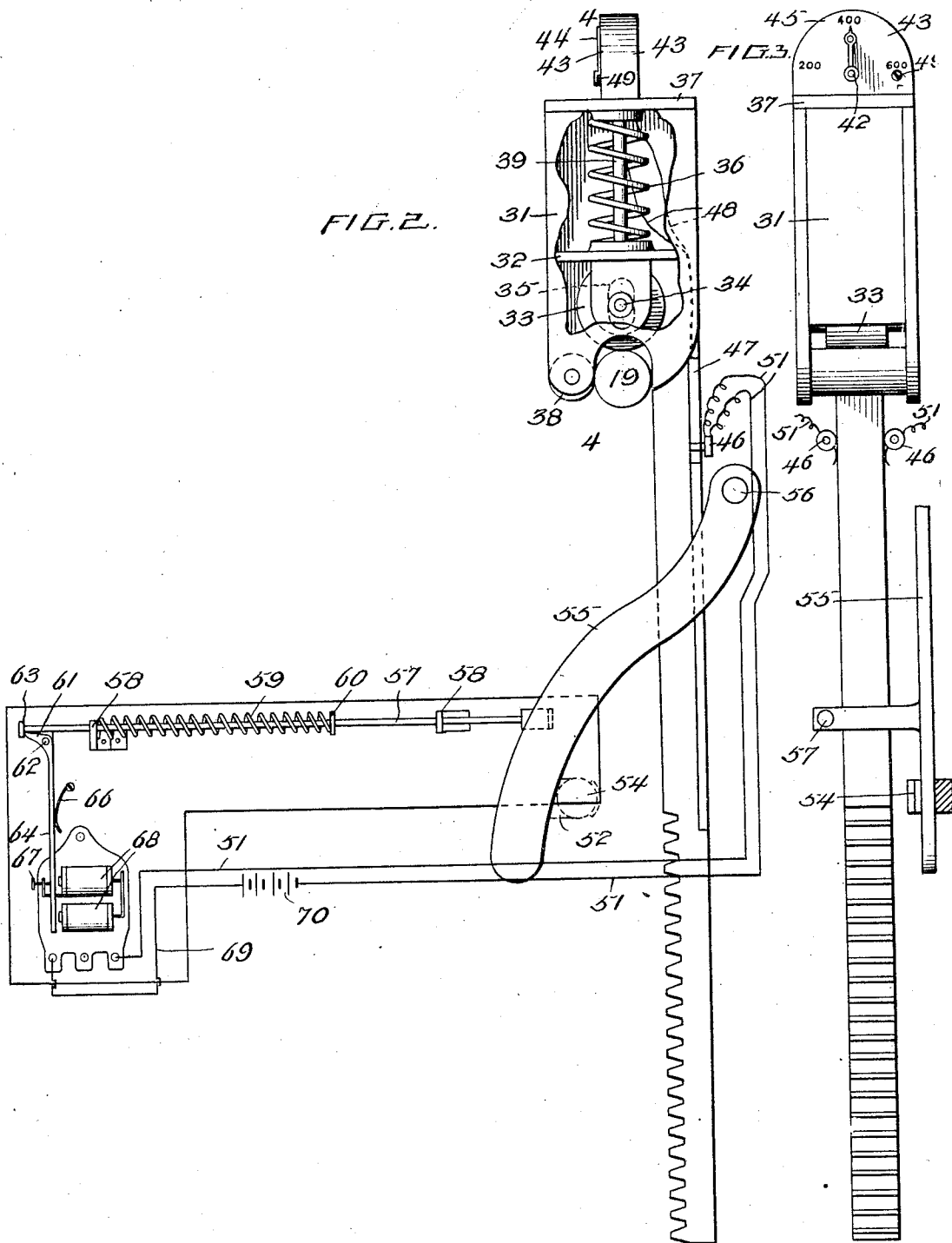
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3 SHEETS—SHEET 2.



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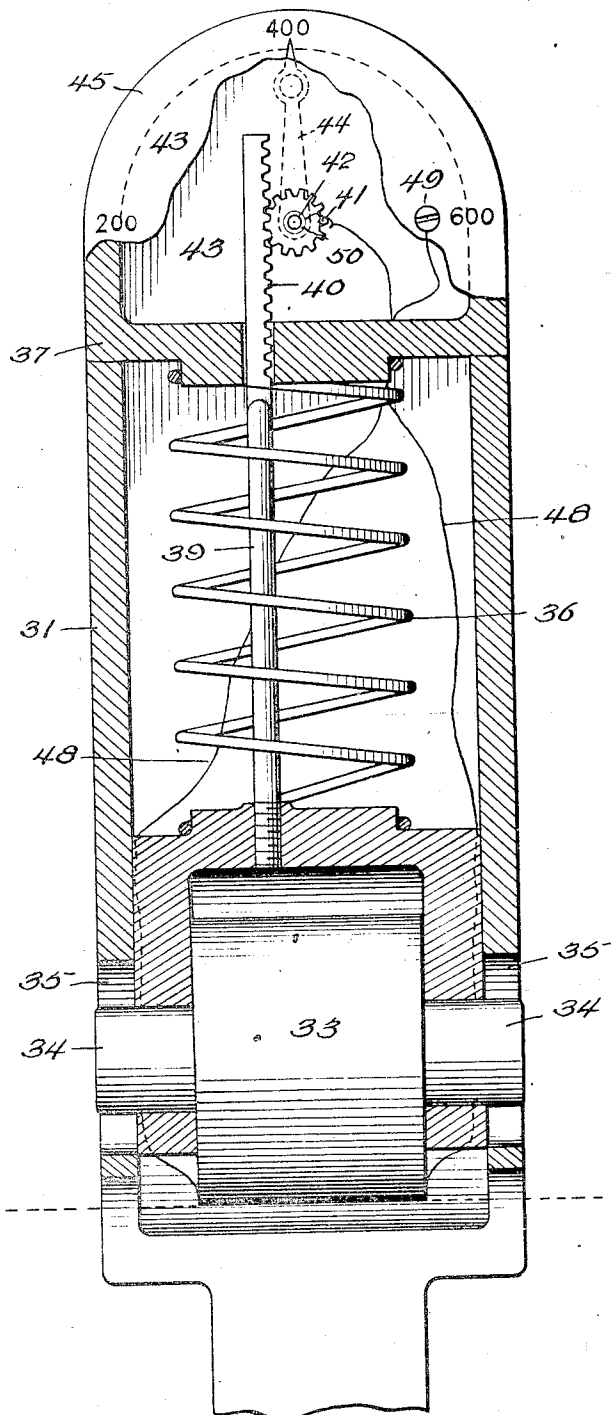
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3 SHEETS—SHEET 3.

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FIG. 4.



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BENJAMIN M. ROGERS, OF ALBEMARLE, NORTH CAROLINA.

LAPPING-MACHINE.

1,037,327.

Specification of Letters Patent.

Patented Sept. 3, 1912.

Application filed May 1, 1911. Serial No. 624,438.

To all whom it may concern:

Be it known that I, BENJAMIN M. ROGERS, a citizen of the United States, residing at Albemarle, in the county of Stanly and State of North Carolina, have invented or discovered certain new and useful Improvements in Lapping-Machines, of which the following is a specification, reference being had therein to the accompanying drawings.

10 Lap winding machines as usually constructed include a frame, a lap-roll upon which is wound the lap delivered from the usual calender rolls, which lap-roll is usually mounted for vertical movement in the frame, 15 rolls for supporting the lap-roll with its accumulated windings of lap, and rack bars engaging at their upper ends the lap-roll and coöperating at their lower ends with tension mechanism, these last named parts 20 operating to apply pressure to the lap as it is wound upon the lap-roll. In machines of this character, by reason either of improper adjustment of the tension mechanism, which is usually so arranged that 25 slight variations in its adjustment result in considerable differences in the pressure applied to the lap, or of clogging and stoppage of the parts, an excessive pressure is frequently applied to the lap, which sometimes 30 results in breakage of the rack bars.

It is one of the objects of the present invention to provide means whereby the pressure applied to the lap-roll will be a yielding one, either at all times or when 35 above a certain predetermined point.

Another object of the invention is to provide means whereby the amount of pressure applied to the lap-roll is automatically measured and indicated.

40 A further object of the invention is to provide improved means whereby an electric circuit will be automatically closed under certain circumstances, as when the pressure on the lap-roll reaches a certain 45 point, and which circuit may be utilized, for example, to sound an alarm.

Still another object of the invention is to provide means controlled by the pressure on the lap roll for automatically stopping the 50 machine.

These and other objects of the invention, together with means whereby the same may be carried into effect, will best be understood by reference to the following description of one form or embodiment thereof 55 illustrated in the accompanying drawings.

It is to be understood, however, that the construction described and shown has been chosen for illustrative purposes merely, and that the invention may be embodied in other forms without departing from the spirit and 60 scope thereof.

In said drawings: Figure 1 is a side elevation of the machine. Fig. 2 is an enlarged side elevation, partly in section, of the rack 65 bar and the mechanism for controlling the stopping of the machine, a part of the electrical connections being indicated diagrammatically. Fig. 3 is a front elevation of the rack bar head. Fig. 4 is a detail sectional view on the line 4-4, Fig. 2.

12 denotes the frame of the machine and 13 the driving shaft which, for reasons which will be hereafter explained, is preferably journaled in a lever 14 pivoted at 15 75 to the frame 12 or a bracket bolted thereto. The driving shaft 13 carries a belt pulley 16 and a gear 17 meshing with a gear 18 from which the various moving parts of the machine are driven, as will be familiar to 80 those skilled in the art.

19 denotes the lap-roll upon which the lap 20 is wound, and 21, 21 are the supporting rollers for the lap-roll and its accumulated lap. 85

22 denotes one of the rack bars resting at its upper end on the end of the lap-roll and formed adjacent its lower end with a rack 23 meshing with a pinion 24 on a shaft 25 90 journaled in the frame 12 and connected with tension mechanism of any suitable form, whereby upward movement of the bars 22 is retarded. As herein shown this tension mechanism comprises a gear 26 on the shaft 25 meshing with a gear 27 on a 95 shaft 28 provided with a brake wheel 29 with which coöperates a brake shoe 30.

In accordance with the present invention the rack bars 22 are each formed with a hollow head 31 in which is movably mounted a 100 slide 32 carrying a roller 33. The pin 34 upon which said roller is rotatably mounted is preferably extended in both directions beyond the slide 32, its ends entering slots 35 in the sides of the head 31. The slide 32 is 105 normally held in its lowermost position with the ends of the pin 34 in the lower ends of the slot 35 by a strong spring 36 interposed between said slide and the upper end 37 of the head 31. The roller 33 rests upon the 110 reduced end of the lap-roll 19 and an additional roller 38 may, if desired, be provided

to engage the side of said end. The slide 32 and spring 36 provide means whereby the downward pressure imparted to the lap-roll is a yielding one.

5 Extending upwardly from the slide 32 is a rod 39 provided with a rack 40 meshing with a pinion 41 on a shaft 42 journaled in uprights 43, 43, forming part of a casing above the upper end 37 of the head 31. One
10 end of the shaft 42 is extended without said casing and has secured thereto a pointer or indicator 44 which, when said shaft is rotated, moves over a dial or scale 45 on the face of the adjacent upright 43. Upward
15 movement of the slide 32 against the tension of the spring 36, caused by an increasing pressure on the lap-roll, will cause the pointer 44 to move over the dial 45 and indicate the amount of such pressure. The
20 spring 36 may be so adjusted as to have no initial tension so that any pressure between the lap-roll 19 and roller 33 will cause a movement of the slide 32 and indicator 44, in which case the dial or scale 45 will be so
25 graduated that when the slide 32 is in its normal or lowermost position said indicator will point to zero. Preferably, however, the spring 36 will be placed under an initial tension, for example of 200 pounds, and the
30 dial 45 so graduated that the pointer 44 will normally indicate the amount of this tension. When so arranged the rack bar 22 will act as a solid bar under all pressures up to 200 pounds and will yield only when the
35 pressure exceeds this amount, such excessive pressure being indicated by the pointer 44.

Suitably mounted on the frame 12 adjacent the rack bar 22 are contact members 46, 46 in sliding engagement with contact
40 strips 47, 47 carried by said rack bar and preferably insulated therefrom in any suitable or well known way. Connecting with the contact strips 47, 47 are wires 48, 48 one of which leads to the shaft 42 and the other
45 of which leads to the contact member 49 on the dial 45 in the path of movement of the pointer 44. The shaft 42 and contact member 49, one or both, are insulated from the rack bar as by bushings 50. The contact
50 member 49 is so located on the dial 45 that it will be engaged by the pointer 44 when the pressure on the lap reaches a predetermined maximum, for example, 600 pounds.

Leading from the contact members 46 are
55 wires 51 forming part of an electric circuit which will be closed by the circuit closer comprising the pointer 44 and contact member 49 when the pressure on the lap reaches a predetermined amount. The closing of
60 this circuit may be utilized for any desired purpose, as, for example, to sound an alarm to notify the operator that the pressure on the lap has become undesirably great. Preferably, however, and in accordance with
65 one feature of the invention, the closing of

the circuit is employed automatically to stop the machine. To this end the following mechanism is provided.

The lever 14 is supported in a position to cause the engagement of the gears 17 and
70 18 by means of a preferably spring pressed bolt 52 which engages a bracket 53 on the frame 12. The bolt 52 is provided with a projecting lug 54 engaged by a knock-off
75 lever 55 pivoted at 56 to the frame 12. The parts just described constitute a stop mechanism for the machine. Movement of the knock off lever 55 to the right in engagement with the lug 54 releases the bolt 52 from the
80 bracket 53 permitting the lever 14 to drop and disengaging the gears 17 and 18. In place of this mechanism any other suitable form of stop mechanism capable of operation by the knock-off lever 55 may be employed.

57 denotes a rod slidably mounted in
85 guides 58 supported by the frame 12, said rod engaging the knock-off lever 55. 59 denotes a spring interposed between one of the guides 58 and a collar 60 fast on the rod
90 57, said spring tending to move said rod to actuate the knock-off lever. Said rod is restrained from movement under the influence of the spring 59 by a catch 61 pivoted at 62 to a suitable part of the frame and engaging
95 a shoulder 63 on the rod 57. The catch 61 is provided with an arm 64 engaged by a spring 66 which normally holds said arm in engagement with an adjusting screw 67 and retains said catch 61 in operative position.
100 Said arms 64 constitutes or carries the armature of an electro-magnet 68 to which is connected one of the wires 51 and a wire 69 leading to a battery or other source of electric energy 70. The electric circuit is completed by the other of said wires 51.
105

The operation of the machine is as follows. The parts being in the positions shown, the lap-roll 19 is rotated and, as the lap accumulates thereon, rises carrying with
110 it the rack bar 22 the upward movement of which is resisted by the tension mechanism connected with the pinion 24, thereby causing pressure to be applied to the lap. When this pressure exceeds a predetermined
115 amount the spring 36 yields, permitting the slide 32 and roller 33 to move upwardly relative to the head 31. This causes the pointer 44 to move over the dial 45 and indicate the amount of the pressure. Should this pressure reach the predetermined maximum, the
120 pointer 44 will engage the contact member 49, thereby closing the circuit from the battery 70 to the electro-magnet 68 and energizing said magnet, which, in turn, attracts
125 the arm 64 of the catch 61 and causes said catch to release the rod 57. The spring 59 thereupon moves said rod to the right, which operates the knock-off lever 55 to stop the machine, as above described.

Having thus described my invention I claim and desire to secure by Letters Patent:

1. In a lapping machine, the combination with a lap-roll, of means for applying pressure to the lap wound on said lap-roll, and means for indicating the amount of said pressure.

2. In a lapping machine, the combination with a lap-roll, of means for applying pressure to the lap wound on said lap roll, and means for indicating the rise of said pressure above a predetermined amount.

3. In a lapping machine, the combination with a lap-roll and tension mechanism, of a bar connected with said tension mechanism, a roller movably mounted on said bar and engaging said lap-roll, a spring connecting said roller and bar, and an indicator operated by said roller.

4. In a lapping machine, the combination with a lap-roll and tension mechanism, of a bar connected with said tension mechanism, a roller movably mounted on said bar and engaging said lap-roll, a spring connecting said roller and bar, a rack movable with said roller, a shaft journaled in said bar and provided with a pinion meshing with said rack, a pointer on said shaft, and a dial on said bar over which said pointer moves.

5. In a lapping machine, the combination with a lap-roll, of means for applying pressure to the lap wound on said roll, an electric circuit, and means for indicating the amount of said pressure and for closing said circuit when said pressure exceeds a predetermined amount.

6. In a lapping machine, the combination with a lap-roll and tension mechanism, of a bar connected with said tension mechanism, a roller movably mounted on said bar and engaging said lap-roll, a spring connecting said roller and bar, an electric circuit, and a circuit closer operated by said roller.

7. In a lapping machine, the combination with a lap-roll and tension mechanism, of a bar connected with said tension mechanism, a roller movably mounted on said bar and engaging said lap-roll, a spring connecting said roller and bar, an electric circuit, a rack movable with said roller, a shaft journaled in said bar and provided with a pinion meshing with said rack, and a circuit closer operated by said shaft.

8. In a lapping machine, the combination with a frame, a lap-roll and tension mechanism mounted in said frame, and a bar slidably mounted in said frame and connecting said lap-roll and tension mechanism for applying pressure to the lap wound on said lap roll, of an electric circuit including contact strips on said bar, and cooperating contact members on said frame, and a circuit closer carried by said bar.

9. In a lapping machine, the combination with a lap-roll and means for applying pres-

sure to the lap wound thereon, of an electric circuit and means controlled by the amount of said pressure for closing said circuit.

10. In a lapping machine, the combination with a lap-roll, tension mechanism, and means connecting said lap roll and tension mechanism for applying pressure to the lap wound on said lap-roll, of an electric circuit, and a circuit closer carried by said connecting means and controlled by the amount of said pressure.

11. In a lapping machine, the combination with a lap-roll and means for applying pressure to the lap wound thereon, of an electric circuit and means for automatically closing said circuit when said pressure reaches a predetermined point.

12. In a lapping machine, the combination with a lap-roll and means for applying pressure to the lap wound thereon of a stop mechanism for said machine and means controlled by the amount of said pressure for operating said stop mechanism.

13. In a lapping machine, the combination with a lap-roll and means for applying pressure to the lap wound thereon, of a stop mechanism for said machine, an electric circuit and connections for controlling said stop mechanism, and means controlled by the amount of said pressure for closing said circuit.

14. In a lapping machine, the combination with a lap roll and tension mechanism, of a rack bar connected with said tension mechanism, a roller movably mounted on said rack bar and engaging said lap-roll, a spring connecting said roller and bar, a stop mechanism for said machine, and means controlled by the movement of said roller relative to said rack bar for operating said stop mechanism.

15. In a lapping machine, the combination with a lap-roll and means for applying pressure to the lap wound thereon, of a knock-off lever, a spring pressed rod for operating said lever, a catch for restraining said rod, and means controlled by the amount of said pressure for operating said catch.

16. In a lapping machine, the combination with a lap-roll and means for applying pressure to the lap wound thereon, of a stop mechanism for said machine and electrically operated means controlled by the amount of said pressure for controlling said stop mechanism.

17. In a lapping machine, the combination with a lap-roll and means for applying pressure to the lap wound thereon, of a knock-off lever, a spring pressed rod for operating said lever, a catch for restraining said rod, an electro-magnet for releasing said catch, and means controlled by the amount of said pressure for controlling the current to said electro-magnet.

18. In a lapping machine, the combination with a lap-roll and tension mechanism, of a rack bar connected with said tension mechanism, a roller movably mounted on
5 said rack bar and engaging said lap-roll, a spring connecting said roller and bar, a knock-off lever, a spring pressed rod for operating said lever, a catch for restraining said rod, an electro-magnet for releasing
10 said catch, and means controlled by the

movement of said roller relative to said rack bar for controlling the current to said electro-magnet.

In testimony whereof I affix my signature, in presence of two witnesses.

BENJAMIN M. ROGERS.

Witnesses:

J. R. BURLESON,
T. C. RIMES.