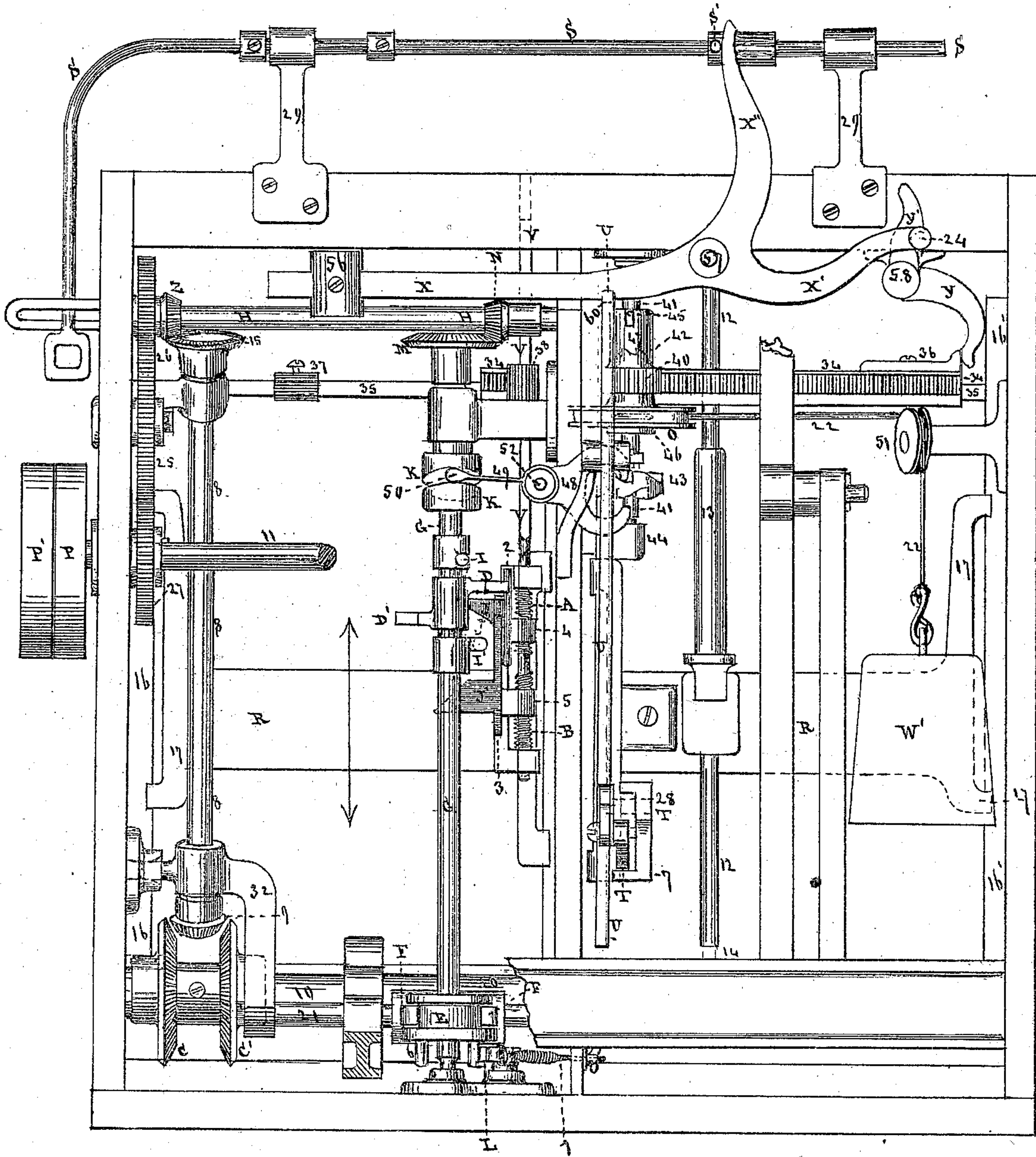


Improvement in Roving Frames.

Eustis P. Morgan and
James H. McMullan.

No. 120,209.

Patented Oct. 24, 1871.



In presence of
B. A. Goodale
Henry S. Howe.

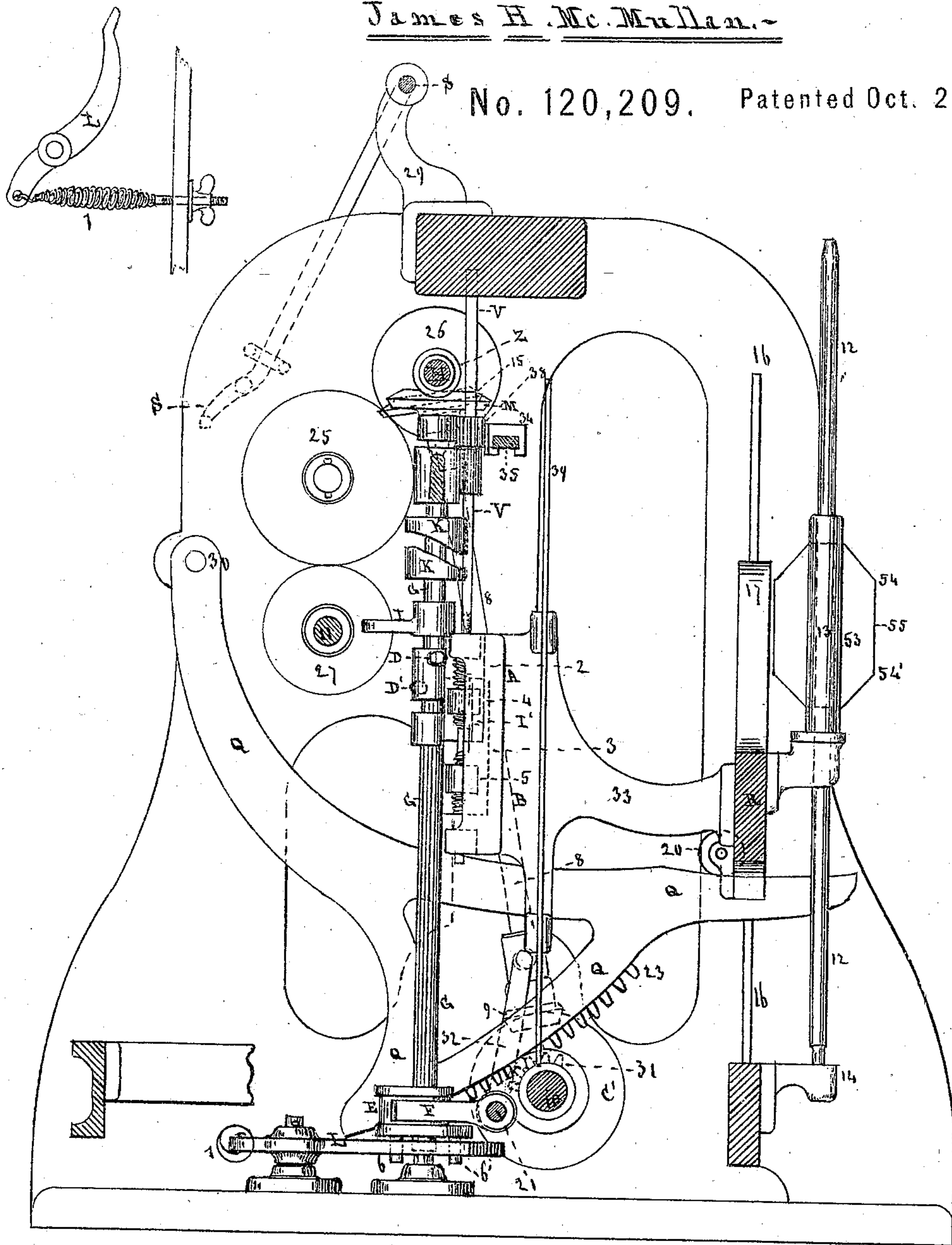
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3. Sheets
Sheet 1, C.-

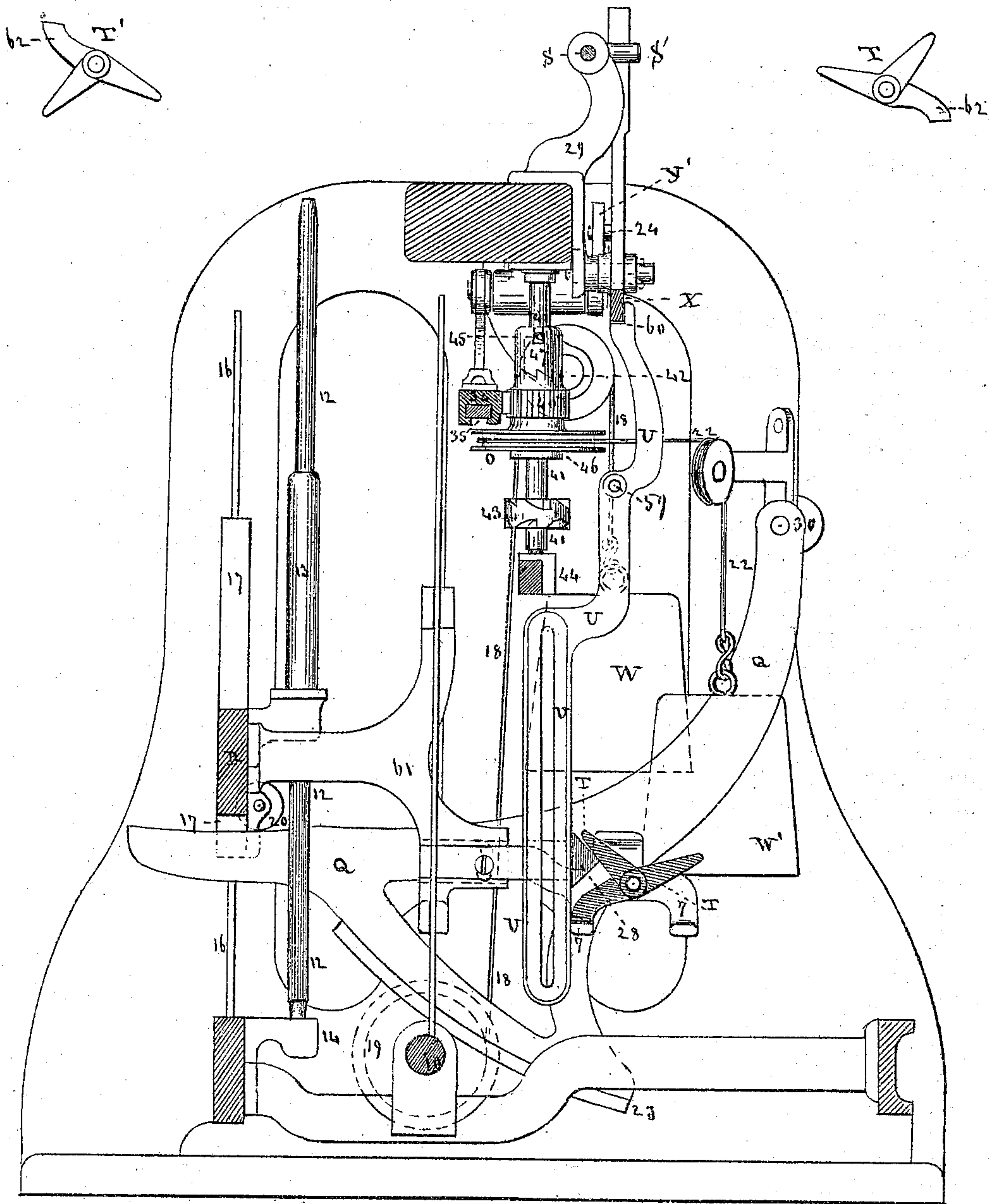
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UNITED STATES PATENT OFFICE.

EUSTIS P. MORGAN, OF SACO, AND JAMES H. McMULLAN, OF BIDDEFORD, ME.

IMPROVEMENT IN ROVING-FRAMES.

Specification forming part of Letters Patent No. 120,209, dated October 24, 1871.

To all whom it may concern:

Be it known that we, EUSTIS P. MORGAN, of Saco, in the county of York and State of Maine, and JAMES H. McMULLAN, of Biddeford, in the county and State aforesaid, have invented a new and useful Improvement in Roving-Frames; and we do hereby declare that the following is a full and exact description of the same, reference being had to the accompanying drawing making a part of this specification.

Our present improvements relate mainly to various parts of the roving-frame for which Letters Patent were issued to us on the 25th day of May, 1869; but may also be used in connection with speeders, fly-frames, slubbers, or other machines for making rovings in the process of the cotton manufacture or of other fibrous substances.

The main features of novelty embraced in this machine are two, viz.: Means for preventing the fracture or injury of the machine in case a certain part of the mechanism as heretofore used fails to effect the proper changes at the right time and in the right manner; and also means for causing the machine to be stopped either during the upward or downward motion of the bobbin-rail, at any definite point, in order that the "end" of the roving on the outer layer may, when the bobbins are "doffed," occupy any required position.

For the general principle and construction of the machine for making roving we would refer to the Letters Patent before named; and we will now describe in full the nature of our specific improvements, which are fully represented in the drawing making a part of this specification.

Sheet A, elevation from the back side of the machine, looking toward the spindles. Sheet B, elevation of the parts nearest to the "driving" end, as seen from the opposite end, with detached sketch of the lever L and spiral spring 1. Sheet C, elevation, looking toward the weights W W' from the driving end, with plans of the tumbler T.

The bobbin-rail R is raised and lowered by means of the quadrants Q, which have their center of motion near the back of the frame, at 30. Friction-pulleys 20 are attached to the rail R, and rest upon the curved ends of the quadrants, these parts being placed at such intervals throughout the length of the frame as to give sufficient support and steadiness to the rail. The lower part of each quadrant is provided with teeth 23, which

engage with the gear 31 on the bottom shaft 10, which revolves in one direction to raise the rail R and the bobbin 13, and in the other direction to lower them. This alternate movement of the shaft 10 in opposite direction is effected by the beveled gears U and U', which are driven successively by the pinion 9 attached to the lower end of the diagonal shaft 8, which is driven by gear 15 and the pinion Z affixed to the top shaft H. This shaft is driven by the train of gears 26 25 27 and the pulley P affixed to the same shaft 11 that carries the gear-wheel 27. The change of the pinion 9 from one of the wheels C to the other, for the purpose of changing the direction of the motion of the rail R, is effected by means of the eccentric E and its fork F, which is moved from right to left on the horizontal rod 21, and carries with it the stand 32 that holds the diagonal shaft 8 and its attached pinion 9. The spiral spring 1 holds the lever L in contact with one of the pins 6 6' at the bottom of the eccentric; this spring, when allowed to act by the escape of one of the dogs D or D' from one of the plates 2 3, effecting the change of the pinion 9 by forcing the lever L, having an incline on its end, against one of the pins 6 6', and thus causing the shaft G to turn so far that the pinion N may engage one of the sections of teeth in the wheel M. The time of making this change is governed by the vertical shaft G, and other parts acting in connection with it. The crown-wheel M, fixed to the top of the shaft G, has two spaces on opposite sides that are not provided with teeth. The teeth are thus divided into two sections, and when the driving-pinion N is over either of these spaces, which is the case when the rail R is rising or falling, no motion is communicated to the shaft G, and there is no movement of the eccentric E and its attached parts; but when the teeth M engage with the pinion N the shaft G and the eccentric make half a revolution and change the pinion 9 from C to C' or from C' to C. This engagement of the crown-wheel M with the driving-pinion N occurs when the dogs D D', which are attached to the shaft G, escape over or under the traversing-plates 2 or 3, which rise and fall with the rail R, being connected with it by the bracket or brace 33. The escape of the dog D takes place when the rail has reached its lowest point, and of the dog D' when it has reached its highest point. In case the spring 1 fails to act upon the

lever L, as above described, one of the plate-jaws J J' pushes one of the fingers I I' and turns the shaft G far enough around to cause the engagement of the pinion N and wheel M, when the shaft G and eccentric E will make half a revolution and reverse the motion of the bobbin-rail R, one of the fingers just touching one of the jaws when the dog is leaving the end of one of the traversing-plates. The action of this mechanism prevents the breakage of the machine, which would occur if the rail motion was not reversed. When a new set of bobbins is to be started the horizontal-toothed rack 34, near the top of the frame, is moved by hand upon the bar 35 until it is in contact with the adjustable stop 37. This motion turns the pinion 40 and the pulley 0, that carries a cord, 22, leading over a fixed pulley, 51, and lifts the weight W'. This weight tends constantly to draw the rack 34 back, the force being exerted at the pin 45 that is fixed in the shaft 41, and rests in a slot at the top of the clutch 47. The clutch, the pinion 40, and the pulley 0 move with the hollow shaft 46 that turns on the vertical shaft 41, the latter shaft being supported by the stand 44. When the hollow shaft is turned backward by the motion of the rack 34 the clutch 47 is disengaged. The shaft 41 also carries the horizontal escape-wheel 43, having teeth or leaves placed alternately on its opposite sides. These teeth are embraced by the forked lever 48, having its center at 52. On the opposite side of this center there is an attached flexible arm, 49, that carries at its end the stud 50. This arm is stiff enough to impart motion to the fork 48, but is made slightly flexible, in order to give easy action and prevent injury in case of derangement of the parts. The stud 50, with its attached arm and fork, is raised and lowered by the scroll-cam K fixed to the shaft G, allowing at each half revolution a tooth to escape on 43 and impart a quick short motion to the rack 34. As the combined length of the plates 2 and 3, by the action of the screws A and B, grows less and less the dogs D escape sooner and cause the rail R to reverse oftener, thus giving it a shorter traverse, and forming the conical or tapered ends of the full bobbin 53. If the last layer of the roving comes at the angle 54, where the tapered part of the bobbin begins, the roving is liable to unwind and cause waste. It is therefore desirable that the frame stop when the rail R is in such a position that the end of roving may be left at a short distance from the angle 54 or 54'. This is effected as described below. The shipper-lever X has two arms. The end of the arm X' has a stud, 24, that rests in a notch made in the shipper-trigger Y Y'; the end X'' extends upward and rests against the stud S' on the shipper S. The center of motion of the shipper-lever is at 57, and the long arm X has an adjustable weight, 56. The shipper-trig-

ger turns on the center 58, and has an arm, Y, that extends downward to the level of the stop 36 that is screwed to the rack 34. A suspended curved rod, U, having its center at 59, has near its lower end a triangular friction-stud, 28, and at its upper end a notch, 60. The arm X of the tri-armed shipper-lever is just above this notch, but does not quite touch it. At every motion of the rail R the tumbler T, which is supported by a bracket, 61, screwed to the rail, comes in contact with the stud 28, and the notch in the suspended arm U is thrown outward; but the shipper-arm X does not fall, as it is held up by the shipper-trigger Y'. When the rack 34 reaches the end of its traverse and the bobbin is full the piece 36 moves the arm Y and releases the stud 24 from the notch in the arm Y'; the weight 56 then depresses the arm X and it falls, as the notch 60 in the suspended arm U does not come back to its place. When this fall takes place the arm X'' acts on the stud S' and throws the shipper S outward, moving the belt from the driving-pulley P to the loose pulley P'. The stud 28 is adjustable vertically, and can be placed at any required position with reference to the rail R, so that the action of the tumbler T may take place at the right moment, and the end of the roving be left at a short distance from the angle 54 or 54' of the full bobbin. The tumbler T occupies the position shown on main view and in the right-hand detached view of Sheet C, when the frame is required to stop as the rail R is going up. If the frame is to stop when the rail is going down the position of the tumbler is reversed, as shown on the left side of Sheet C. An arm, 62, projects from the tumbler in such a position that its motion may be checked by stops on the stand that supports the tumbler.

What we claim is—

1. The combination, with the eccentric E, the fork F, the shaft G, and the dogs D D', of the fingers I I', the plate-jaws J J', or their equivalents, for the purpose of setting in operation the mechanism for causing the reversal of the bobbin-rail R in case of the breakage or non-action of the spring 1.

2. The combination of the shipper S, the shipper-lever X X' X'', the trigger Y Y', the vertical rod U, the tumbler T, and the friction-stud 28, or their equivalents, for stopping the frame automatically when the last coil on the outside of the bobbin of roving is near to the conical or beveled end of the bobbin, substantially as herein described.

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JAS. H. McMULLAN. [L. S.]

Witnesses:

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HENRY S. HOWE.

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