

(No Model.)

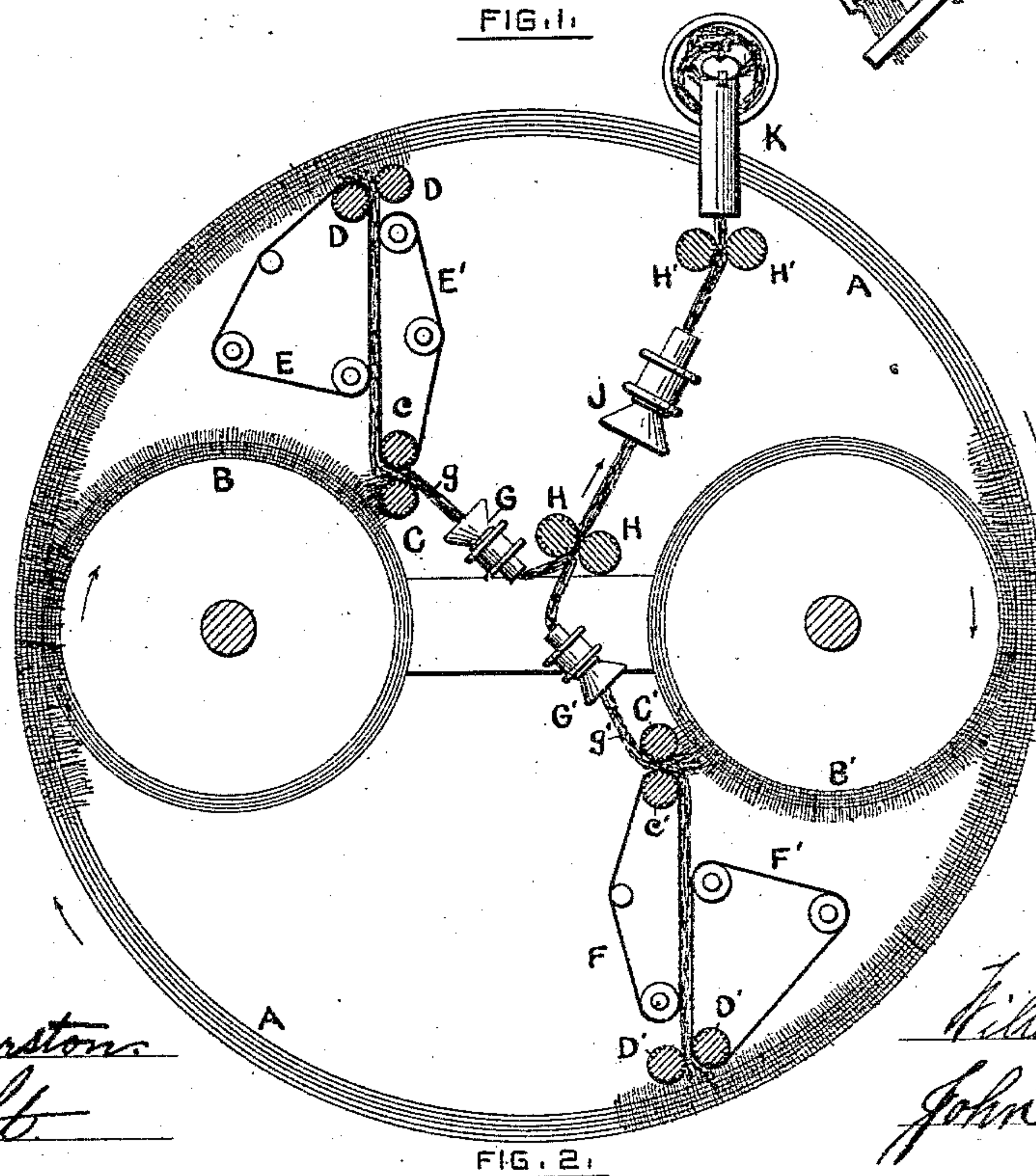
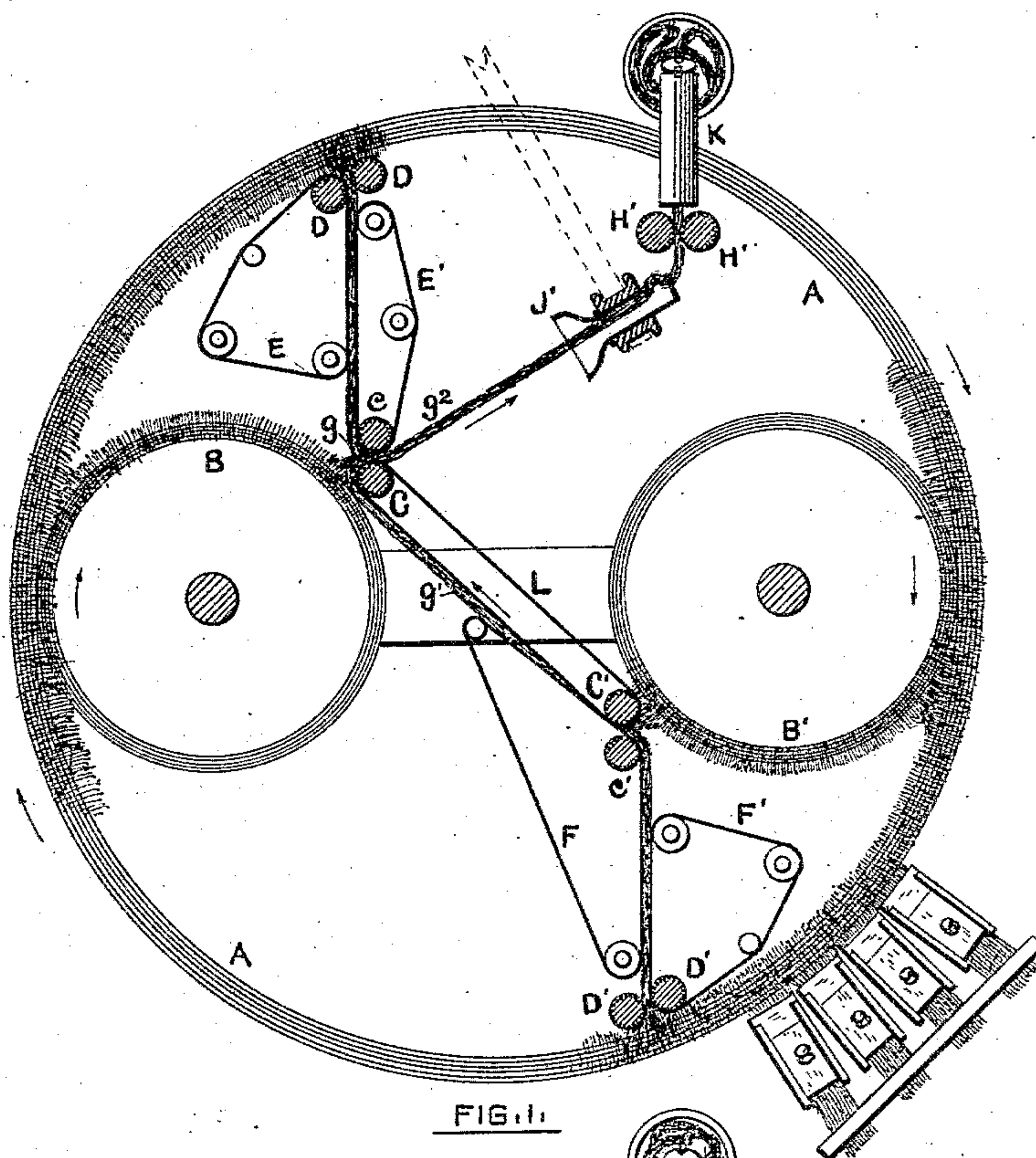
2 Sheets—Sheet 1.

W. HALL & J. MIDGLEY.

MACHINE FOR COMBING FIBROUS MATERIAL.

No. 295,165.

Patented Mar. 18, 1884.



WITNESSES.

W. H. Thurston.  
I Knight.

INVENTORS.

William Hall  
John Medgley.

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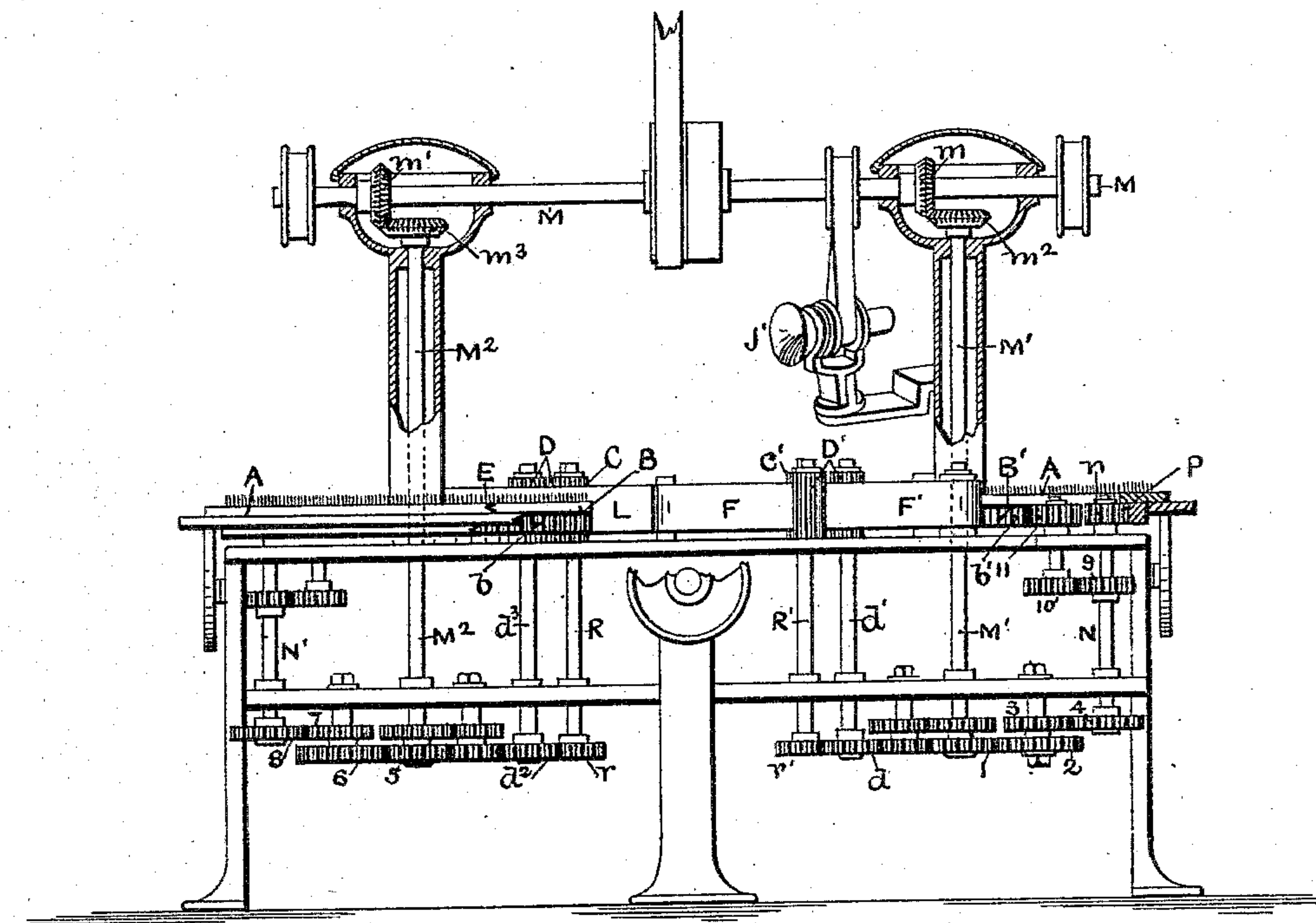


FIG. 3.

WITNESSES.

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# UNITED STATES PATENT OFFICE.

WILLIAM HALL AND JOHN MIDGLEY, OF PAWTUCKET, RHODE ISLAND,  
ASSIGNORS OF ONE-HALF TO WILLIAM F. SAYLES AND FREDERIC C.  
SAYLES, BOTH OF SAME PLACE.

## MACHINE FOR COMBING FIBROUS MATERIAL.

SPECIFICATION forming part of Letters Patent No. 295,165, dated March 18, 1884.

Application filed April 21, 1883. (No model.)

*To all whom it may concern:*

Be it known that we, WILLIAM HALL and JOHN MIDGLEY, subjects of the Queen of Great Britain, residing in Pawtucket, in the county of Providence and State of Rhode Island, have jointly invented a new and useful Improvement in Machines for Combing Fibrous Material; and we do hereby declare that the following specification, taken in connection with the accompanying drawings, forming a part of the same, is a full, clear, and exact description thereof.

Our invention consists in the means employed for combining the two slivers which are produced on opposite sides of the machine, and to means for preventing any portion of such slivers from winding about the rolls which deliver said slivers, whereby the machine is simplified in construction and rendered more perfect in action, as will hereinafter appear.

Referring to the drawings, Figure 1 represents in plan a portion of a machine embodying the improvement as applied to one of the well-known forms of combing-machines. Fig. 2 shows in plan a portion of a combing-machine in general use. Fig. 3 represents an elevation and partial section of the improved machine, showing the means for rotating the combs, rolls, &c.

The machine in common use, a portion of which is shown at Fig. 2, employs a large annular revolving comb, A, two small annular revolving combs, B B', two pairs of fluted rolls, C c and C' c', which remove the material from the combs B B', respectively, two pairs of rolls, D D and D' D', which draw material from the comb A, aprons E E' and F F', which deliver the slivers from the rolls D D and D' D' to the rolls C c and C' c', respectively, two revolving trumpets, G G', for receiving and twisting the slivers g g', respectively, two pairs of condensing-rolls, H H', a revolving guide-trumpet, J, located between said pairs of rolls, and a duct or conveyer, K, for delivering the product from the machine. The means by which the combs, rolls, &c., are revolved are shown in Fig. 3.

The machine is provided with a driving-

shaft, M, bearing beveled gears  $m m'$ , which mesh with beveled gears  $m^2 m^3$  on shafts M' M<sup>2</sup>, respectively. By means of trains of gears 1, 2, 3, 4 and 5, 6, 7, 8 the shafts M' M<sup>2</sup> respectively revolve shafts N N', each of which is provided at its upper end with a gear,  $n$ , only one of which is shown. The gears  $n$  mesh with an internal gear, P, attached to the main comb A, by means of which said comb is revolved. The comb B' is rotated by gears 9, 10, 11, the former being on the shaft N, and the latter meshing with the gear  $b'$  on said comb. The comb B is similarly revolved from the shaft N', the gear upon the upper end of said shaft meshing with the gear  $b$  on said comb. One of the rolls D' is driven from the shaft M' by suitable gearing connecting with the gear  $d$  on the shaft  $d'$ , upon which shaft the said roll is mounted. The fellow roll D is revolved by friction. One of the rolls D is driven from the shaft M<sup>2</sup> by suitable gearing connecting with the gear  $d^2$  on the shaft  $d^3$ , upon which shaft the said roll is mounted. The fellow roll D is revolved by friction. The rolls C' and C are driven from the shafts M' and M<sup>2</sup>, respectively, by suitable gearing connecting with the gears  $r'$  and  $r$  on the shafts R' and R, upon which the rolls C' and C are respectively mounted. The fellow rolls  $c'$  and  $c$  are revolved by friction.

The combing-machine above referred to as in common and general use is known under the name of the "Noble comb," and as a whole is a very complex machine. Fig. 3 of the drawings, however, sufficiently exhibits to any person skilled in the construction of this class of machines the means by which the several combs and drawing-off or delivery rolls are actuated, in order to render intelligible the improvement which we have made.

We have found that in the use of combing-machines of former construction—such as are illustrated at Fig. 2—portions of the slivers are liable to wind about the rolls C C' to such an extent as to bend and oftentimes to break the teeth of the combs B B', to which said rolls are closely adjacent, thereby greatly damaging the machine.

The object of our improvement is to sim-



plify the construction of the machine, in order to more effectually prevent the slivers from winding about the rolls C C' and injuring the combs. To these ends we dispense with the trumpets G G' and the mechanism used for revolving the same, and, as shown in Fig. 1, employ an apron, L, which passes around the rolls C and C', and conveys the sliver g' from the rolls C' c' to the rolls C c, in order that said sliver may be combined with the sliver g, and both slivers be condensed by the rolls C c, thereby enabling the condensing-rolls H, Fig. 2, and means for driving the same, to be dispensed with. The apron L also performs another valuable office, in that, by passing around the rolls C and C', it prevents any portion of the slivers from winding about said rolls and causing damage to the teeth of the combs B B'. Thus, it will be seen, from an inspection of Fig. 1, that the sliver delivered by the rolls D', when it reaches the belt L, combines with the sliver from the comb B', and as the endless belt L travels in the direction indicated by the arrow and covers the roll C', it is impossible for any portion of the sliver to wrap around the roll C' and become entangled with the teeth of the comb B', and the same protection against entanglement with the teeth of the comb B is provided at the roll C. Preferably the apron F is extended, as shown in Fig. 1, as an assistant in guiding the sliver g', although such extension is not essential. The combined slivers having been condensed by the rolls C c into a single sliver, g<sup>2</sup>, as shown in Fig. 1, such sliver passes directly to the revolving trumpet J', which is constructed to perform the twisting operation. From the trumpet J' the sliver is delivered from the machine by the usual mechanism.

From the foregoing description it will be seen that the characteristic feature of our improvement is combining the delivery-rolls C and C' by means of an endless conveyer-belt, L, whereby the slivers, which are the products of the action of the combs, are prevented from wrapping around the rolls C C' and becoming entangled with the teeth of the combs B B'. Incidentally, the rolls C c and C' c' can be made of smaller diameter than the rolls formerly used, and be set closer to their respective combs B B'. The whole apparatus is simplified in construction, and requires far

less attention on the part of the operative, and the resulting sliver delivered as the final product is more solid, and therefore less liable to break down, for the reason that its components have traveled through a better protected and less broken path than they were obliged to travel in the old Noble machine.

We are aware of the improvement in this class of machines described in English Patent No. 2,529 of 1877. Our improvement is distinguishable from that described in said patent in the circumstance that the rolls C and C' of the two sets of drawing-off or delivery rolls, appropriate to the two small revolving combs, are directly connected with each other by means of an endless traveling apron or conveyer, and to prevent the liability of the slivers becoming wrapped around the rolls, only this one endless belt is required, whereas in the machine described in said English patent these two sets of rolls are not so connected, and the employment of two endless belts and suitable guide-pulleys for the same is necessary to protect the two combs.

What we claim as our invention, and desire to secure by Letters Patent, is—

1. The combination, substantially as hereinbefore set forth, of the revolving combing-cylinders B B', delivery-rolls C c and C' c', appropriate thereto, and an endless traveling apron or conveyer arranged to embrace the rolls C and C' of the two sets of delivery-rolls pertaining to the combing-cylinders, respectively, substantially as described.

2. The combination, substantially as hereinbefore set forth, of the revolving combing-cylinder A, the revolving combing-cylinders B B', delivery-rolls C c and C' c', appropriate, respectively, to the latter combs, means, substantially as described, for conveying the combed slivers from the comb A to the said rolls, and an endless traveling apron or conveyer directly connecting the rolls C and C' of the two sets of delivery-rolls, whereby the combed product is conducted so as to be united in a single sliver, as set forth.

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Witnesses:

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