2 Sheets—Sheet 1.

T. H. RUSHTON & J. MACQUEEN.

Combing Machine.

No. 208,991. Patented Oct. 15, 1878.

FIG. 2.

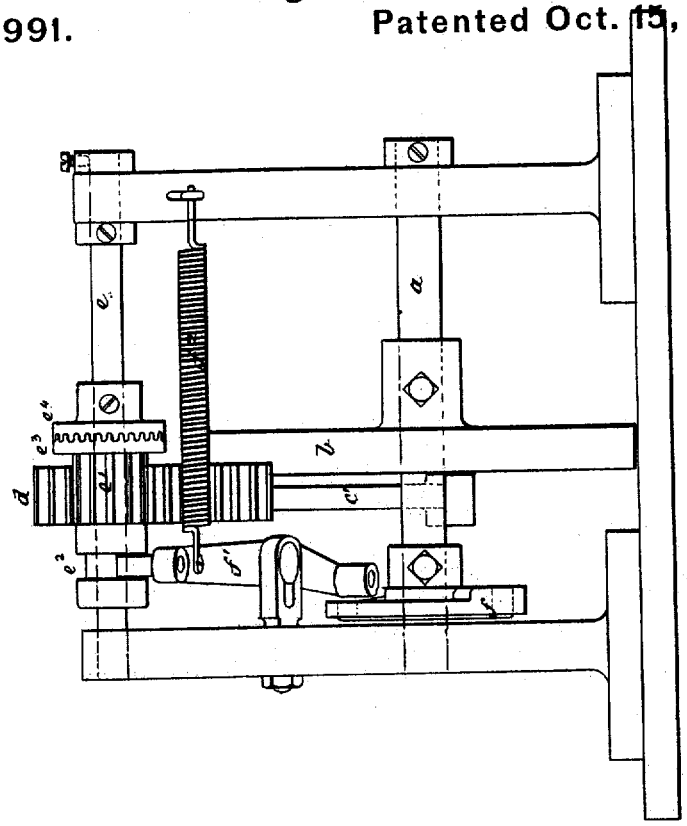


FIG. 1.

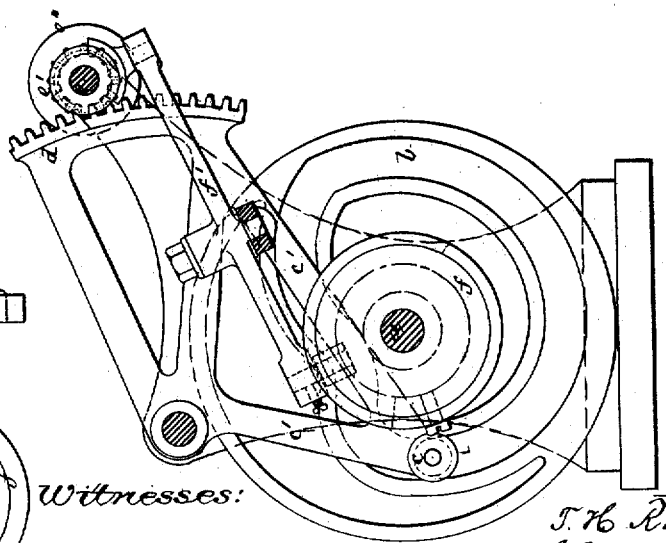


FIG. 4.

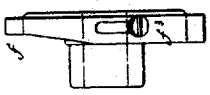
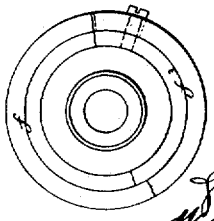


FIG. 3



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2 Sheets—Sheet 2.

T. H. RUSHTON & J. MACQUEEN.

Combing Machine.

No. 208,991. **Patented Oct. 15, 1878.**

FIG. 6.

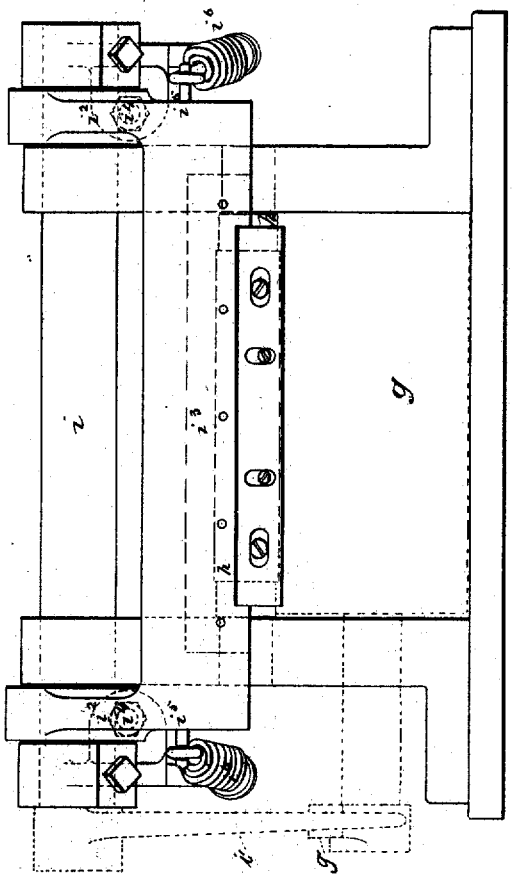
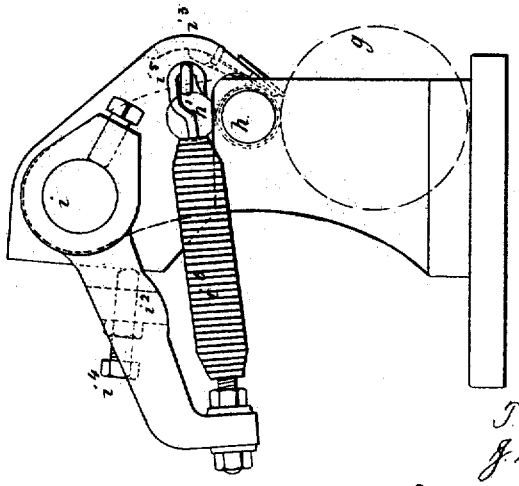


FIG. 5.



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UNITED STATES PATENT OFFICE.

THOMAS H. RUSHTON AND JAMES MACQUEEN, OF BOLTON, ENGLAND.

IMPROVEMENT IN COMBING-MACHINES.

Specification forming part of Letters Patent No. **208,991**, dated October 15, 1878; application filed September 3, 1878; patented in England, September 14, 1872.

To all whom it may concern:

Be it known that we, THOMAS HENRY RUSHTON, of the firm of Messieurs Dobson & Barlow, of Bolton, in the county of Lancaster, in England, machine-maker, and JAMES MACQUEEN, of the same place, machinist, have invented certain new and useful Improvements in Machinery for Combing Cotton and other Fibrous Substances; and we hereby declare the following to be a full, clear, and exact description thereof, reference being had to the annexed two sheets of drawings, forming part of this specification.

Our invention consists in certain improvements upon the combing-machines for which Letters Patent were granted in England to Josué Heilmann on the 25th day of February, 1846, No. 11,103.

The first part of our invention consists in certain improved combinations of machinery for imparting the requisite advancing and retrograde motions to the detaching and piecing rollers.

The second part of our invention relates to the nipping apparatus; and it consists in certain improved modes of constructing the said parts, to reduce the cost of construction and the difficulty of adjustment.

On Sheet 1, Figure 1 is an end view, and Fig. 2 a front view, of our improved machinery for imparting the requisite advancing and retrograde motions to the detaching and piecing rollers.

a is the cam-shaft, and *b* the cam, in which is a groove, acting on a bowl, *c*, which projects from the lever *c'*, to which is cast the toothed segment *d*, which gears into the pinion e^1, loose on the axle of the detaching-roller *e*. To the shaft *a* is also fixed the cam *f*, which acts on a bowl projecting from the lever f^1. The toothed segment *d* remains at all times in gear with the pinion e^1, and a groove is cut in the boss of this pinion at e^2, and half of a small clutch-box, e^3, is cast to the other side of the pinion e^1. The other half clutch-box, e^4, is fast to the axle of the detaching-roller *e*, which is placed in close proximity to the combing-roller, and, in conjunction with the piecing-roller, which is likewise placed close to the said combing-roller and a little above the detaching-roller, returns the fiber to the combing-roller, to be acted upon again in their retrograde movement; but in their advance movement they withdraw it from the combing-roller and cause it to overlap the other portions previously drawn between them, thereby producing uniform slivers.

The small cam *f* works the lever f^1 from its face, and a swivel-key at the other end of the lever takes into the groove e^2 of the pinion e^1. The clutch-box e^3 is put into gear by the spring f^2 and drawn out of gear by the cam *f* and lever f^1 at the proper times; and, in order to facilitate the relative amount of advance and retrograde motions, the cam *f* is made in two parts, as shown in Figs. 3 and 4, the segment f^3 being connected to the body of the cam *f* by set-screws passing through slots.

On Sheet 2, Fig. 5 is an end view, and Fig. 6 a front view, of the feeding-roller and nipping apparatus of a combing-machine constructed according to our improvements. In these views, *h* is the feeding-roller, which, instead of being placed at some distance from the circumference of the combing-cylinder *g*, as in Heilmann's machines, is brought close to, but just clear of, the combs on the cylinder. *h'* is the upper feed-roller. To the nipper-shaft *i* are fixed the lifters i^2, through which the set-screws i^4 pass. The nipper-plate i^3 is loose on the same shaft, and it is lined with cloth and leather, or other elastic substance, to form a cushion where it acts on the feed-roller *h*. The studs i^5, projecting from the nipper-plate, are acted upon by two spiral springs, i^6, the other end of each spring being connected to the lifters i^2. On the end of the shaft *i* is fixed a double lever, which is acted upon by a double cam on the shaft *g* to open and shut the nipper at the proper time. When the cam on the shaft *g* lifts the said double lever on the shaft *i*, and with it the lifters i^2, which, through the set-screws i^4, lift the nipper-plate i^3 from the feed-roller *h*, the feed-rollers *h* and *h'* push the cotton forward. The nipper is then again acted upon by the said cam, double lever, and springs, which bring the plate i^3 down on the cotton passing over the feed-roller *h*, where it is held close to the combs on the cylinder *g* while it is combed, the feed-roller remaining stationary when the nipper-plate is in contact with it.

This arrangement produces a great reduction

in the number of working parts and facilitates the setting of the nipper. The lapping of the bottom feed-roller and the consequent breaking of the nipper-knife levers and the destruction of the cylinder-combs are entirely avoided.

Having thus stated the nature of our invention and described the manner of performing the same, we declare that what we claim herein as new, and desire to secure by Letters Patent of the United States, is—

1. The cam-shaft a, the cams b f, levers c' f^1, the toothed segment d, the spring f^2, the sliding pinion e^1, provided with the groove e^2 and half-clutch e^3 and the stationary half-clutch e^4, in combination with the detaching-roller e, substantially as and for the purpose described.

2. The cam f, consisting of two concentric rings, held together by a set-screw, substantially as and for the purpose described.

3. The shaft i, the nipper-plate i^3, the lifters i^2, the spring i^6, the set-screw i^4, the lever i^1, the cam g', and comb-cylinder shaft g, in combination with the feed-roller h, substantially as and for the purpose described.

In testimony whereof we have hereunto set our hands before two subscribing witnesses.

THOS. H. RUSHTON.
JAMES MACQUEEN.

Witnesses:
C. A. BARLOW,
J. W. APPLEBY.