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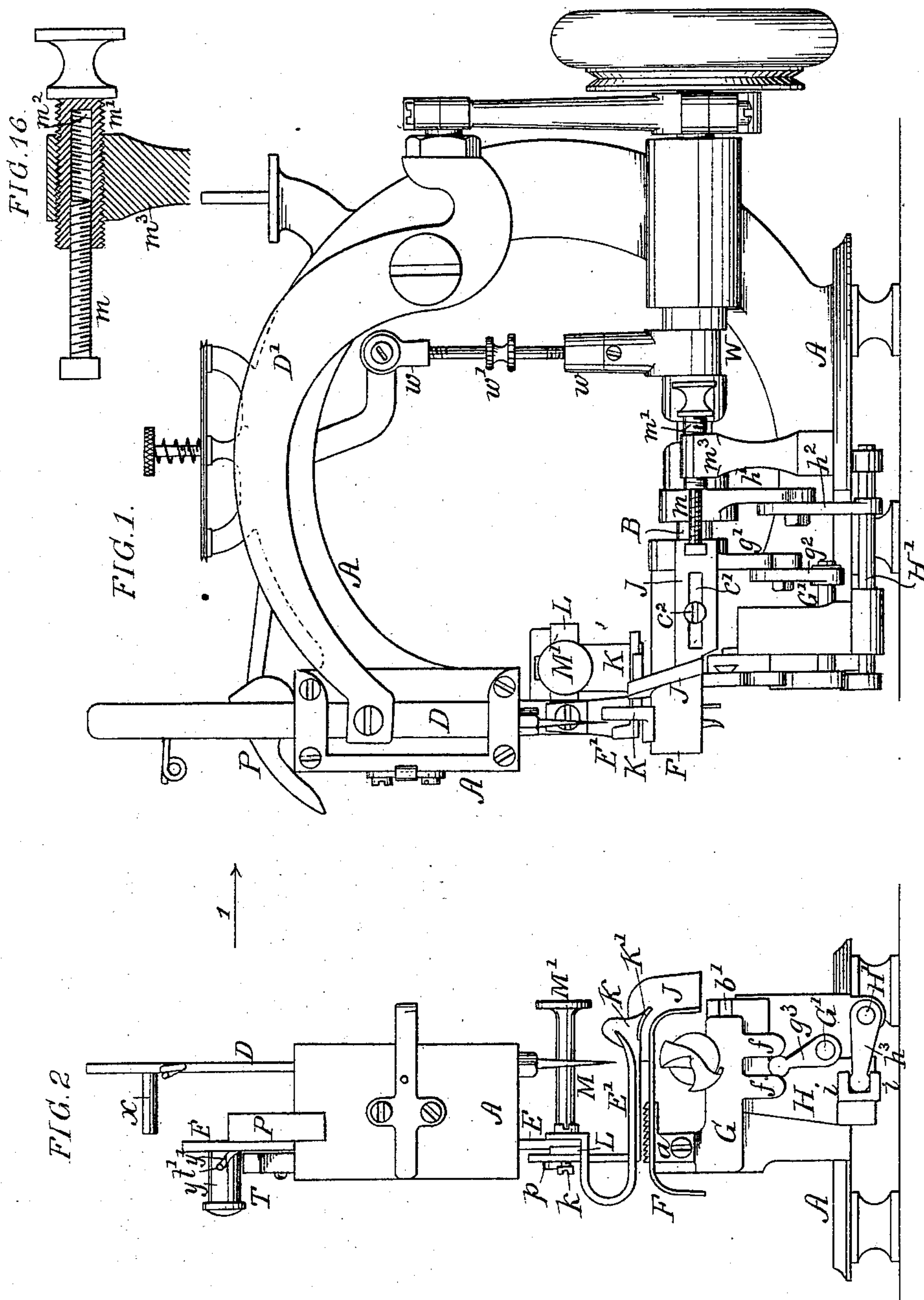
3 Sheets—Sheet 1.

F. BLACKBURN.

STRAW BRAID SEWING MACHINE.

No. 279,855.

Patented June 19, 1883.



WITNESSES:

James F. Tobin  
David Williams

INVENTOR:

Frederick Blackburn  
by his Attorneys  
Hosmer and Sons

(No Model.)

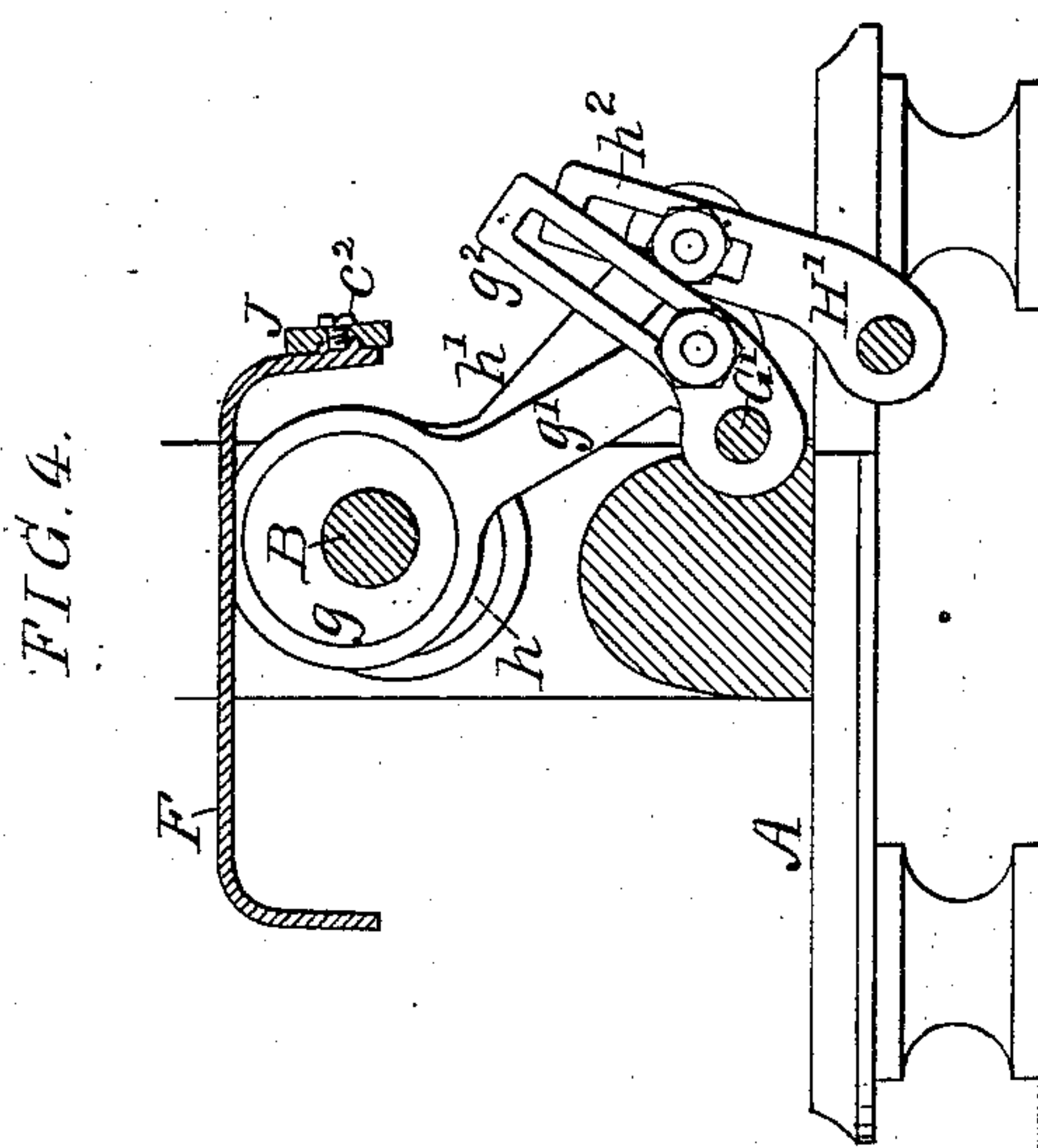
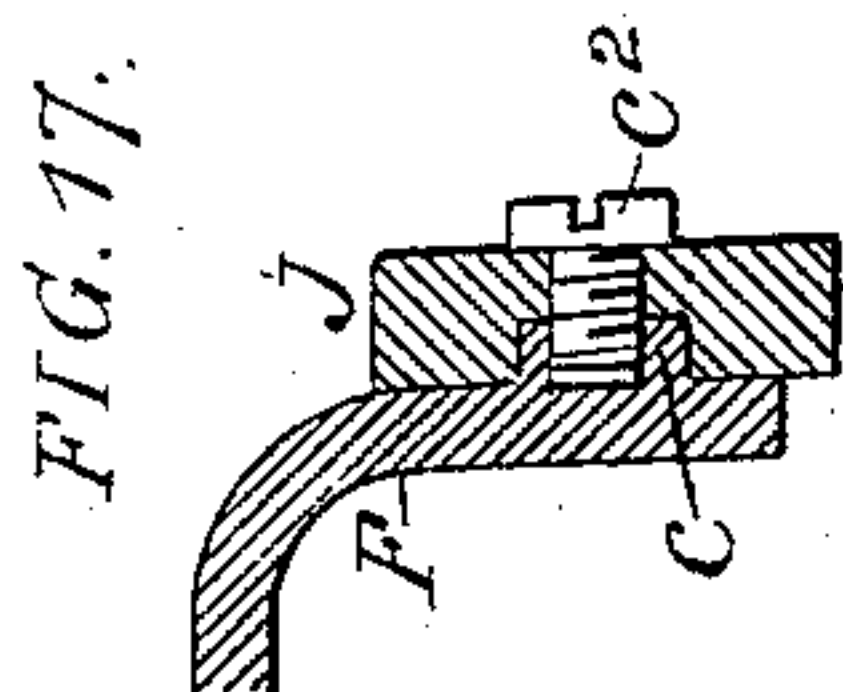
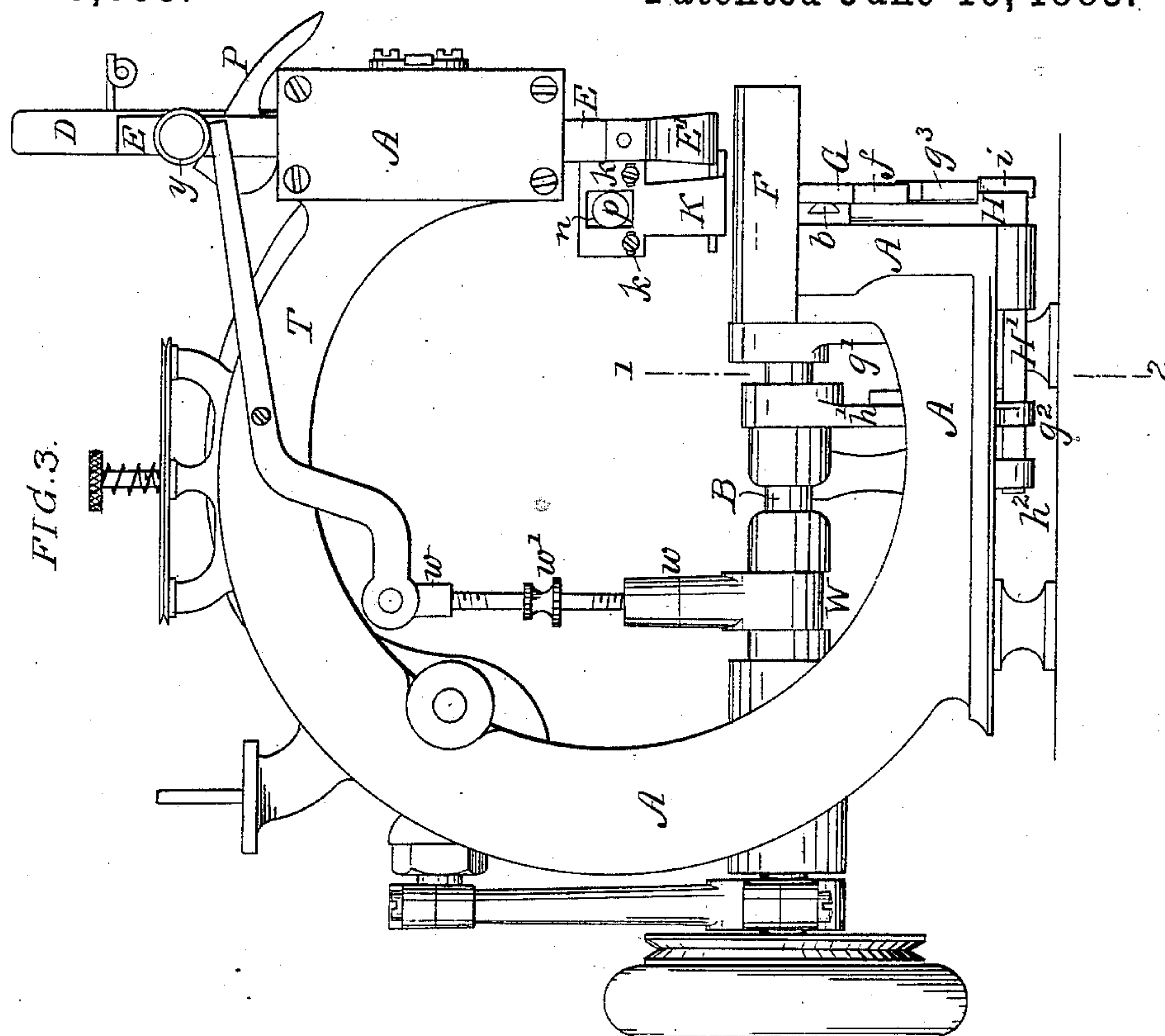
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Horn and May

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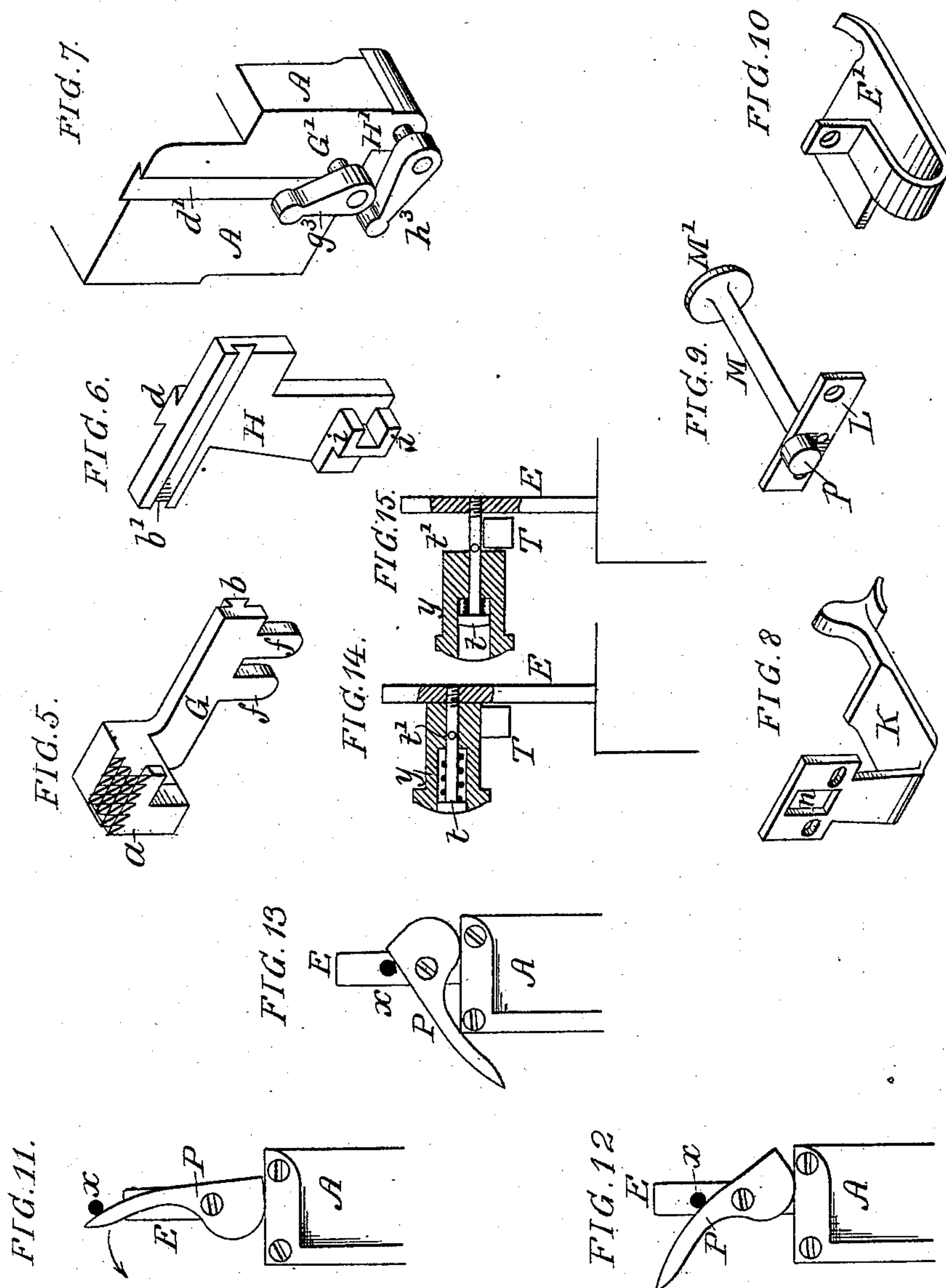
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David Williams

INVENTOR:

Frederick Blackburn  
by his Attorneys  
Howson and Son



# UNITED STATES PATENT OFFICE.

FREDERICK BLACKBURN, OF PALMYRA, ASSIGNOR TO F. H. HOVEY, OF BEVERLY, NEW JERSEY.

## STRAW-BRAID-SEWING MACHINE.

SPECIFICATION forming part of Letters Patent No. 279,855, dated June 19, 1883.

Application filed November 13, 1882. (No model.)

*To all whom it may concern:*

Be it known that I, FREDERICK BLACKBURN, a citizen of the United States, and a resident of Palmyra, Burlington county, New Jersey, have invented certain Improvements in Straw-Braid-Sewing Machines, of which the following is a specification.

My improvements relate especially to the feed mechanism, to the braid-guides, to the mechanism for relieving the pressure on the braid at intervals, so as to facilitate the turning of the circular mat of braid in sewing the crown of the hat, and to means for automatically lowering the presser-foot on the commencement of the sewing operation.

In the accompanying drawings, Figure 1, Sheet 1, is a front view of a sewing-machine of the Willcox & Gibbs type with my improvements; Fig. 2, a view of the end of the same, looking in the direction of the arrow 1; Fig. 3, Sheet 2, a rear view of the machine; Fig. 4, a transverse section on the line 1 2, Fig. 3; Figs. 5, 6, and 7, Sheet 3, detached perspective views of parts of the feeding mechanism; Figs. 8, 9, and 10, detached perspective views of parts of the upper braid-guide; Figs. 11, 12, and 13, diagrams illustrating the action of the device for automatically releasing the presser-foot on the commencement of the sewing operation; Figs. 14 and 15, views illustrating the action of the presser-foot lifter; Fig. 16, Sheet 1, an enlarged sectional view of the means for adjusting the lower braid-guide; and Fig. 17, Sheet 2, an enlarged sectional view of the means for guiding and retaining the same.

A is the frame of the machine, having bearings for the driving-shaft B and guides for the needle-bar D and presser-bar E, the needle-bar being actuated by a lever, D', hung to the frame A and driven by means of an eccentric and connecting rod, as usual.

F is the work-plate of the machine, which is made as narrow as possible transversely, so as to permit the turning of the hat, and is provided at both its front and rear edges with a downwardly-projecting flange, as shown in Fig. 2. The work-plate is slotted, as usual, for the reception of the serrated feed-plate a, which is secured to a bar, G, a dovetailed rib, b, on the back of the latter being adapted to

a horizontal slot, b', of similar form, in a bar, H, and a dovetailed rib, d, on the back of said bar H is adapted to a vertical slot, d', in the frame A, so that the bar G is capable of horizontal movement on the bar H, and the latter is free to be moved vertically on the frame. These movements are effected by means of two eccentrics, g and h, on the shaft B. The eccentric g actuates an eccentric-rod, g', which is connected to a slotted arm, g<sup>2</sup>, on a rock-shaft, G', adapted to bearings on the frame A, said shaft having another arm, g<sup>3</sup>, the end of which is embraced by projections f f on the bar G. (See Figs. 1 to 7.) The reciprocation of the bar H is effected by similar means, comprising the eccentric h, eccentric-rod h', slotted arm h<sup>2</sup>, rock-shaft H', arm h<sup>3</sup>, and lugs i i, so that by properly timing the eccentrics the desired upward, forward, downward, and backward movements of the feed-plate are effected, the lift of the plate being governed by the adjustment of the end of the rod h' in respect to the arm h<sup>2</sup>, and the length of the feed by the adjustment of the rod g' in respect to the arm g<sup>2</sup>, as will be readily understood.

J is the guide for the under layer of braid, said guide being fitted to the front of the work-plate F, and free to slide longitudinally thereon, a rib, c, on the plate being adapted to a groove in the back of the guide, and the latter having a slot, c', for the reception of the confining-screw c<sup>2</sup>, as shown in Figs. 1, 4, and 17.

The adjustment of the guide is effected by the means shown in Figs. 1 and 16. To the rear end of the guide is connected a screw-stem, m, which is adapted to an internally-threaded opening or nut, m<sup>2</sup>, in a stem, m', an external thread on which is adapted to a threaded opening in a stud, m<sup>3</sup>, on the frame A. The thread of the stem m' is right-handed and the thread of the stem m left-handed, so that on turning the stem m' in either direction there will be a compound movement, partly of the stem m' in the stud m<sup>3</sup> and partly of the stem m in the same direction in the nut m<sup>2</sup>, formed by the threaded opening of the stem m'. The extent of movement of the guide J is thus greater than that of the stem m', so that rapid adjustment of the guide is effected, the right and left threads on the stems m m'



also tending to prevent the accidental shifting of the guide.

Instead of providing the stem  $m'$  with an internally-threaded opening for the reception of a screw-stem,  $m$ , on the guide, the stem  $m$  may form a projection of the stem  $m'$ , and may be adapted to a nut on the guide, the result being the same in either case.

K is the guide for the upper layer or mat of braid, this guide having the usual separator-plate,  $K'$ , which fits between the upper and lower layers of braid. The guide consists of a plate located beneath the presser-foot  $E'$ , and having its rear end bent upward, and hung, by means of screws  $k$ , to a bar, L, secured to the presser-bar E by the same screw which confines the presser-foot.

To an opening,  $n$ , in the plate K is adapted an eccentric or cam,  $p$ , which is secured to or forms part of a spindle, M, adapted to turn in a bearing on the bar L, the front end of the spindle having a head,  $M'$ , whereby said spindle may be readily turned. (See Figs. 3, 8, 9, and 10.) The turning of the spindle causes the cam  $p$  to so act on the plate K as to effect the longitudinal movement of the same on the bar L, the plate being slotted for the reception of the confining-screws  $k$ , so as not to interfere with this movement. The guide for the upper braid can thus be readily adjusted by simply turning the spindle M, and said guide may be secured in position, after adjustment, by tightening the screws  $k$ . The guide J for the lower braid may also be secured in position, after adjustment, by tightening the screw  $c'$ . The presser-bar E of the machine is acted upon by a spring tending to depress the same, as usual, and is maintained in an elevated position by means of a cam-lever, P, hung to the upper end of the bar E, and adapted to bear upon the top of the frame A. In ordinary machines this lever must be manipulated by the attendant, in order to permit the descent of the presser-foot after the work has been properly adjusted beneath the same. This necessity I obviate by providing the needle-bar D with a pin,  $x$ , which occupies such relation to the lever P that when the latter is in the position shown in Fig. 11 the pin will, on the descent of the needle-bar, be brought into contact with the long arm of the lever, and will move the latter in the direction of the arrow, this movement continuing until the parts are in the position shown in Fig. 12, immediately after which the lever ceases to exert any control over the presser-bar, and the full descent of the latter, under the action of the spring, is permitted, as shown in Fig. 13.

I am aware that I am not the first to effect the automatic release of the presser-bar on the commencement of the sewing operation, as machines have been devised in which the lever controlling the presser-bar has been actuated by the needle-arm on the descent of the needle-bar; hence this feature of my invention is limited to the construction shown, which has

been adopted as the simplest and most effective plan to be used in connection with a machine of the class represented.

In sewing straw-braid in the manufacture of hats or bonnets, especially when sewing the circular mat of braid for the crown, it is advisable to relieve the braid from the pressure of the presser-foot immediately after the completion of the feeding operation, so as to permit the ready turning of said circular mat in order to bring it properly under the presser-foot prior to the next feed. It therefore becomes necessary to lift the presser-bar slightly in the intervals between the feeding operations, and to accomplish this I provide the shaft B with an eccentric, W, the rod  $w$  of which is connected to the short arm of a lever, T, hung to the frame A, the long arm of said lever terminating at the presser-bar, and immediately beneath a pin,  $t$ , projecting therefrom. On this pin is a sliding stud,  $y$ , which can be adjusted on the pin so as to be within range of the lever T, as shown in Fig. 14, or beyond the range of said lever, as shown in Fig. 15. When the stud is in the position shown in Fig. 14, the long arm of the lever T, on each vibration of the latter acts, upon said stud and imparts a slight lift to the presser-bar; but when the stud is retracted, as shown in Fig. 15, the lever T fails to exercise any control over the presser-bar, the stud being adjusted to this position when the machine is sewing those portions of the hat which do not demand the periodical raising of the presser-foot.

The eccentric-rod  $w$  has a threaded section,  $w'$ , by turning which the relation of the end of the long arm of the lever T to the stud  $y$  may be so changed as to vary the amount of lift imparted to the presser-bar. The adjustment of the stud  $y$  on the pin  $t$  is effected, in the present instance, by turning said stud, a lug,  $t'$ , on the pin  $t$  being adapted to a cam-slot,  $y'$ , in the stud  $y$ , so that the turning of the stud will cause the same to slide to and fro on the pin.

A spring is preferably interposed between the head of the pin  $t$  and a shoulder in the stud  $y$ , the tendency of this spring being to thrust the stud toward the presser-bar.

A cam or crank-pin, may replace the eccentric W, and cams or crank-pins may also replace the eccentrics  $g$  and  $h$ , if desired, this being within the judgment of the mechanic.

Instead of providing the rock-shafts  $G'$  and  $H'$  with arms adapted to engage with lugs on the bars G and H, the latter may have racks adapted to pinions on the shafts, and a rack and pinion may be substituted for the cam or eccentric, whereby the spindle M is caused to actuate the guide K.

I claim as my invention—

1. The combination of the feed-plate of a sewing-machine with a vertically-guided bar, H, a bar, G, guided horizontally on said bar H, a pair of rock-shafts,  $G'$  and  $H'$ , a pair of eccentrics adapted to actuate said rock-shafts, and mechanism, substantially as described, whereby



the rock-shafts are caused to actuate the bars, as set forth.

2. The combination of the feed-plate *a*, the vertically-guided bar H, the bar G, guided horizontally on said bar H, and the rock-shafts G' and H', having arms *g*<sup>3</sup> and *h*<sup>3</sup>, adapted to engage with lugs on the bars G and H, as set forth.

3. The combination of the feed-plate *a*, vertically-guided bar H, bar G, guided horizontally on the bar H, the rock-shafts G' and H', the eccentrics *g* and *h*, rods *g'* *h'*, slotted arms *g*<sup>2</sup> *h*<sup>2</sup>, and arms *g*<sup>3</sup> *h*<sup>3</sup>, as set forth.

4. The combination of the braid-guide J with an adjusting device comprising threaded stems *m* and *m'*, nut *m*<sup>2</sup>, and stud *m*<sup>3</sup>, the thread of one stem being right-handed and that of the other left-handed, as set forth.

5. The combination of the presser-bar E, its foot E', and bar L above the same, with the upper braid-guide, K, fitted beneath the presser-foot, and having at the rear a projection secured to the bar L, but capable of adjustment thereon, as set forth.

6. The combination of the presser-bar E, its foot E', and bar L above the same, with the guide K, fitted beneath the presser-foot, but

having at the rear a projection secured to the bar L, and with the horizontal spindle M, carried by the bar L, and provided with means for actuating the guide, as set forth.

7. The combination of the presser-bar E and the retaining-lever P, hung to the upper projecting portion of said bar, and adapted to bear upon the top of the head A, with the needle-bar D, having a laterally-projecting pin, *x*, adapted to strike said lever P, as set forth.

8. The combination of the lever T with the presser-bar, having a pin, *t*, and a stud, *y*, adjustable on said pin, so as to be within or beyond the control of the lever, as set forth.

9. The combination of the lever T with the presser-bar, having a pin, *t*, with lug *t'*, and the stud *y*, capable of turning on the pin, and having a cam-slot, *y'*, adapted for the reception of said lug, as set forth.

In testimony whereof I have signed my name to this specification in the presence of two subscribing witnesses.

FREDERICK BLACKBURN.

Witnesses:

HARRY DRURY,  
HARRY SMITH.