

(No Model.)

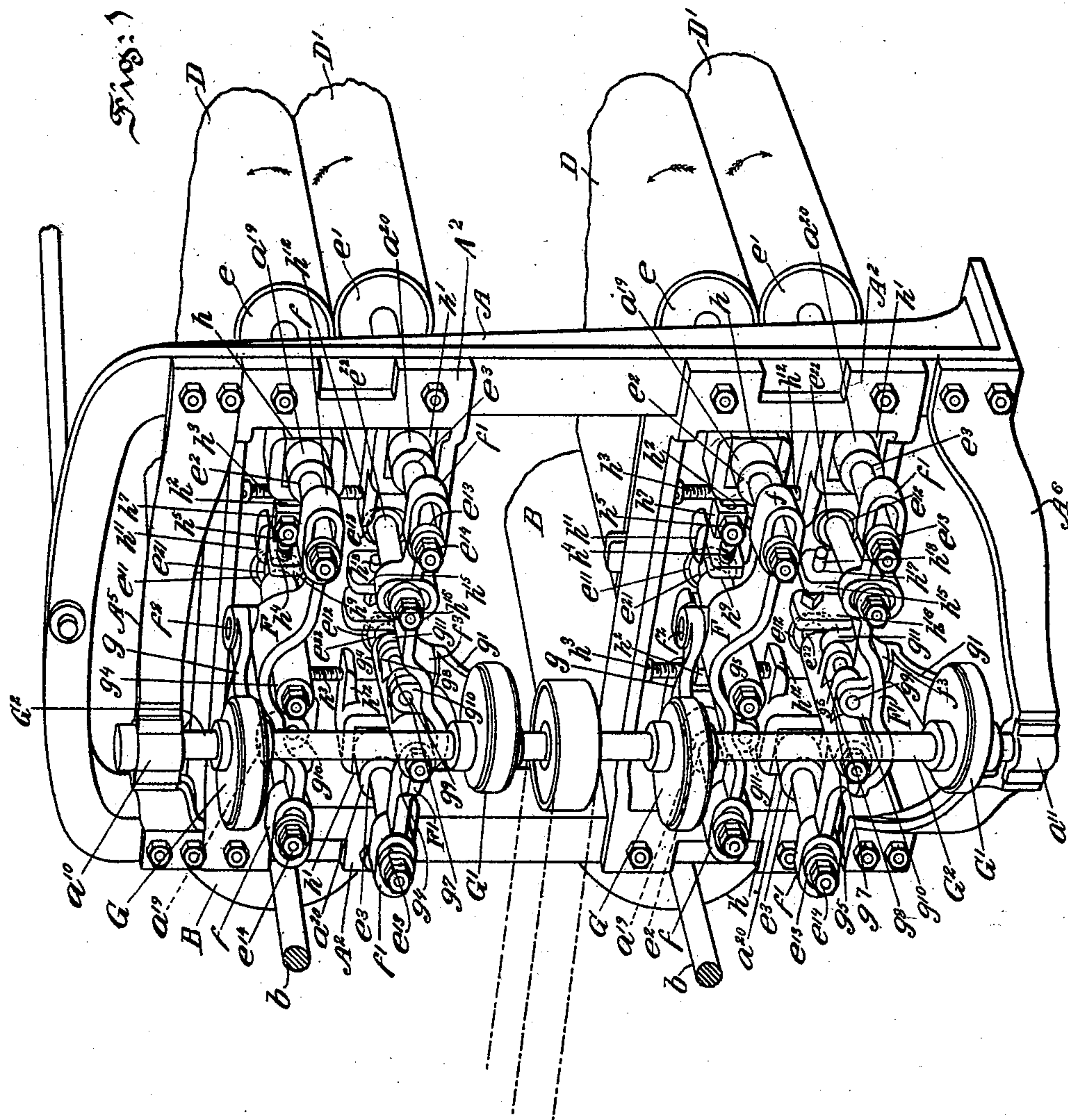
2 Sheets—Sheet 1.

J. CROMIE.

CONDENSER OR FINISHER CARDING MACHINE.

No. 523,832.

Patented July 31, 1894.



Witnesses:  
Thomas M. Smith.  
Richard B. Maxwell.

Inventor,  
John Cromie,  
By Walter Douglas,  
attorney.

(No Model.)

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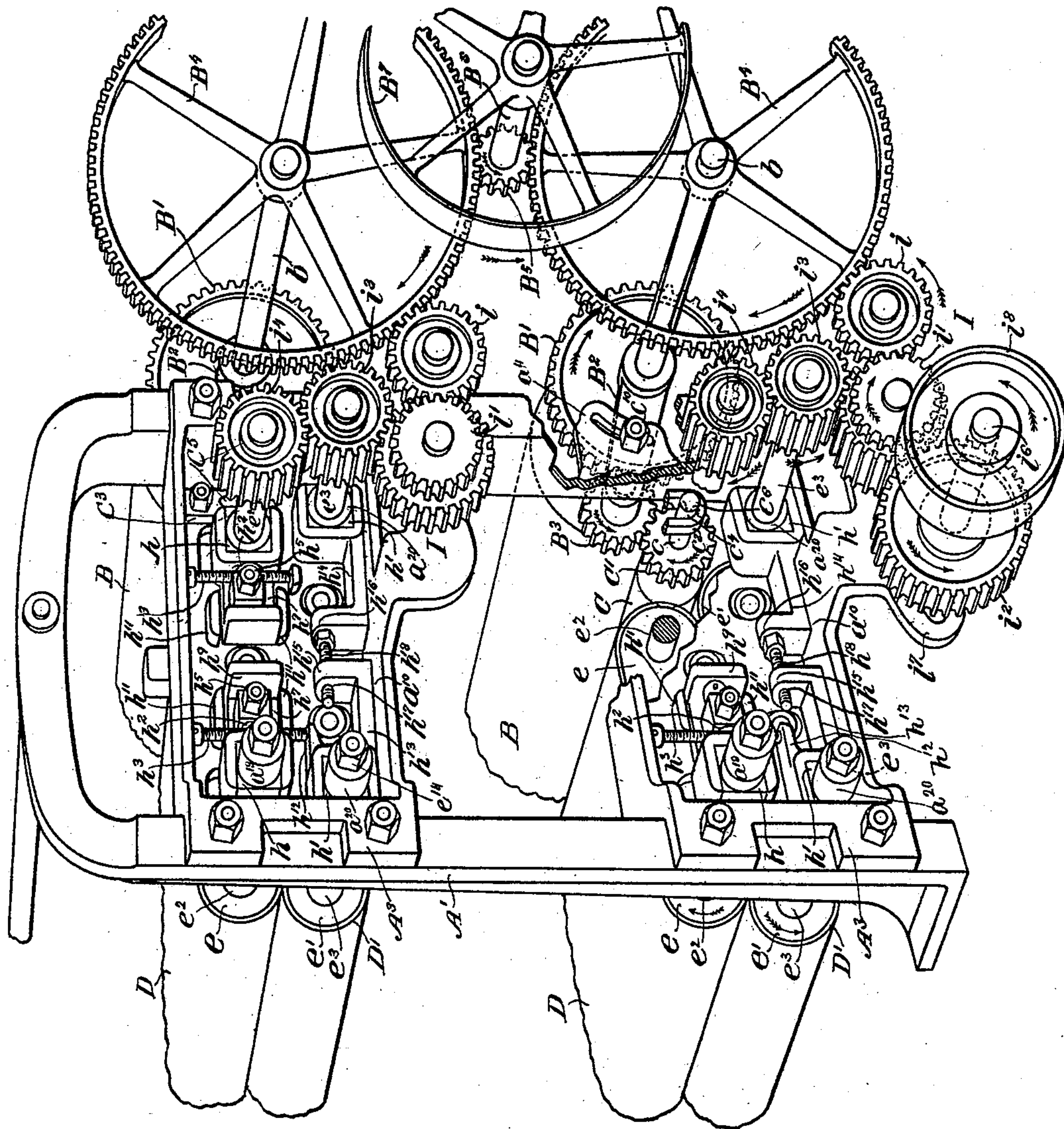


Fig: 2.

Witnesses:  
Thomas M. Smith.  
W. A. Schaefer.

Inventor.  
John Cromie,  
By J. Walter Douglass.  
Attorney.



# UNITED STATES PATENT OFFICE.

JOHN CROMIE, OF CAMDEN, NEW JERSEY, ASSIGNOR TO THE M. A. FURBUSH & SON MACHINE COMPANY, OF SAME PLACE.

## CONDENSER OR FINISHER CARDING-MACHINE.

SPECIFICATION forming part of Letters Patent No. 523,832, dated July 31, 1894.

Application filed August 19, 1893. Serial No. 483,538. (No model.)

*To all whom it may concern:*

Be it known that I, JOHN CROMIE, a citizen of the United States, residing at Camden, in the county of Camden and State of New Jersey, have invented certain new and useful Improvements in Condenser or Finisher Carding-Machines, of which the following is a specification.

My invention has relation in general to condenser or finisher carding machines; and it relates more particularly to the construction and arrangement of the rub-mechanism thereof and to means adapted to engage and disengage a doffer-roll to control the relative speed of the said doffer-roll with respect to the doffer-cylinder and independent movements of the rub-apron mechanism of the machine.

Hitherto many objectionable features have been presented in the working of condenser or finisher carding machines and among them may be mentioned first, the difficulty in keeping the rub-mechanism in frictional contact and under proper tension and to insure a freedom of rotary as well as reciprocating motion to obtain at all times a good rubbing action upon the sliver or slubbing to be transformed into roving; and second, the difficulty of increasing or decreasing at will the rate of speed of the doffer-roll with respect to the doffer-cylinder in order to insure effective action on the sliver or slubbing preparatory to its treatment by the rub-mechanism to transform the same into roving, without disorganizing the machine with its attended labor, time and expense.

The principal objects of my present invention are first, to overcome the above mentioned disadvantageous features and to provide a comparatively simple, durable and efficient condenser or finisher carding machine having adjustable rub-apron mechanism arranged so as to compensate for wear, warping and stretching or slackening thereof and mechanism adapted to be connected with the doffer-roll and the doffer-cylinder of the machine so as to vary relatively the rate of speed of said roll with respect to said cylinder, whereby is permitted the treatment of either coarse or fine fibrous material; and second, to provide a condenser or finisher carding machine with a gear-mechanism interposed be-

tween the doffer-cylinder and the doffer-roll and adapted to be brought into engagement therewith to increase or decrease the speed of rotation of said roll with respect to said cylinder independently of the movements of the rub-apron mechanism of the machine.

My invention consists of the improvements in a condenser or finisher carding machine hereinafter described and claimed.

The nature and general features of my invention will be more fully understood from the following description taken in connection with the accompanying drawings forming part hereof; and in which—

Figure 1, is a perspective view of the rub apron mechanism of my invention, the said view being taken from the eccentric side of the machine and showing in detail the construction and arrangement of the mechanism of the rub-aprons; and Fig. 2, is a similar view of the rub-apron mechanism, the doffer-cylinder, doffer-roll, and also means adapted to engage and disengage said doffer roll to permit of the rotation of said roll from said cylinder and also to permit of the changing of the speed of said roll with respect to said cylinder independently of said rub-apron mechanism embodying features of my invention, the said view being taken from the gear side of the machine.

Referring to the drawings A and A', are the end standards of the machine of any suitable construction provided with upper and lower cross-frames A<sup>2</sup> and A<sup>3</sup>, suitably bolted thereto on the respective sides of the machine for supporting certain mechanisms of my invention to be hereinafter fully described.

B, is the doffer cylinder mounted on and keyed or otherwise secured to a shaft b, which is provided with a gear-wheel B'. It should be borne in mind that two of such cylinders are employed, as illustrated in Figs. 1 and 2.

B<sup>2</sup>, is a movable arm mounted on the shaft b, adjacent to the gear-wheel B', as illustrated in Fig. 2, and carrying at its free extremity a gear-wheel B<sup>3</sup>, which is suitably journaled thereto and adapted to mesh with the gear wheel B', of the cylinder B, and with a gear C', mounted on a shaft c. This shaft c, is provided with a doffer-roll C, which is keyed or otherwise secured thereto.



$c^2$  and  $c^3$ , are hangers depending from the frames  $A^2$  and  $A^3$ , on both sides of the machine and provided with oblong slots  $c^4$  and  $c^5$ , for the reception of the ends of the shaft  $c$ , of the doffer-roll C.

The doffer-roll C, may be removed from the slotted hangers depending from the frames  $A^2$  and  $A^3$ , by the release of the movable arm  $B^2$ , from its engagement with the slotted yokes  $a^4$ , formed integral with or secured to the standard  $A'$ , as illustrated in Fig. 2, by loosening the tightening device  $c^{10}$ , to cause said movable arm with its gear  $B^3$ , to be disengaged from the gear  $C'$ , of the doffer roll C, and without interfering with the doffer cylinder B, or disorganizing the rub-motion mechanism of the machine. In a word, the gear-wheel  $B^3$ , as arranged may be readily caused to engage or to be disengaged from the gear  $C'$ , of the doffer-roll C, in order that the relative rate of speed of the doffer-roll with respect to the doffer cylinder may be varied by removing the doffer-roll and applying a larger or smaller gear  $C'$ , to the shaft  $c$ , as requirements may demand.

$B^4$ , are gear-wheels mounted on one end of each of the doffer cylinder shafts  $b$ , as shown in Fig. 2, and interposed between these wheels and meshing therewith is a gear  $B^5$ , which is mounted on a shaft  $B^6$ , carrying a pulley  $B^7$ , at the free extremity thereof and adapted to be engaged by a belt, not shown, for rotating said pulley, thereby imparting through the gear  $B^5$ , rotary motion to the upper and lower gear-wheels  $B^4$ , for a purpose to be presently more fully explained.

I, represents a gear mechanism for controlling the rotation of the rub-apron mechanism from the positively actuated gears of the doffer cylinder and comprises a train of gear wheels  $i$ ,  $i'$ ,  $i^2$ ,  $i^3$  and  $i^4$ , arranged and adapted for operation in the manner indicated by the arrows in Figs. 2. The upper train of gears being the same as the lower train, both have been designated by the same reference letters. The gear-wheel  $i^2$ , is mounted on a shaft  $i^6$ , which is journaled to and supported from a hanger  $i^7$ , depending from the lower end frame  $A^3$ , of the machine; and carries a pulley  $i^8$ , for the reception of a belt adapted to impart motion to a winding frame mechanism, not shown, because forming no part of my present invention. Certain of the gears, namely  $i^3$  and  $i^4$ , are applied to the end journals of the tightening rolls of the rub-apron mechanism of the machine, as clearly illustrated in Fig. 2.

It may be here remarked that the gear mechanism herein-above mentioned forms no part of my present invention, but has been shown simply as a well known means of imparting rotary motion to the doffer-cylinders and rub-apron mechanism of the machine, which embody the characteristic features of my invention.

D and D', are top and bottom rub-aprons,

which are respectively held under proper tension lengthwise by means of end tightening rolls  $e$  and  $e'$ , provided with end journals  $e^2$  and  $e^3$ , extending through bushings or boxes  $a^{19}$  and  $a^{20}$ , in loose engagement with bearing blocks  $h$  and  $h'$ , connected with the top and bottom cross-frames  $A^2$ , and  $A^3$  as clearly shown in the drawings. The bushings or boxes  $a^{19}$  and  $a^{20}$ , extend along the journals  $e^2$  and  $e^3$ , until they engage the said bearing yokes to permit of the reciprocation thereof.

The rub-aprons D and D', are held in frictional contact with one another by means of intermediate rolls provided with end journals  $e^{21}$  and  $e^{22}$ , which are held in top and bottom bushings, boxes or bearings  $e^{11}$  and  $e^{12}$ . The two series of bearing blocks  $h$ , on the respective sides of the machine are provided with bearing posts  $h^2$ , for the reception of vertically and longitudinally disposed screw-bolts  $h^3$  and  $h^4$ , with tightening nuts  $h^5$ , working in ways  $h^7$ , provided in the cross-frames  $A^2$  and  $A^3$ , and engaging back-stops  $h^9$ , and lugs  $h^{11}$ , cast preferably with the respective cross-frames. In the ways  $h^7$ , the screw-bolts  $h^4$ , are afforded a range of movement. The threaded screw-bolts  $h^3$  and  $h^4$  respectively engage the series of back stops  $h^9$  and lugs  $h^{12}$ , in order to permit of the adjustment of the respective rolls of the top and bottom aprons so as to maintain the latter under proper tension lengthwise and in frictional contact with each other. The lower bearing blocks  $h'$ , on the gear side of the machine as shown Fig. 2, are provided with complementary longitudinal arms  $h^{13}$  and  $h^{14}$ , with lugs  $h^{15}$  and  $h^{16}$ , one of which is provided with a threaded aperture  $h^{17}$ , for the reception of a screw-bolt  $h^{18}$ . The arms  $h^{13}$  and  $h^{14}$ , engage the bottom of the frames  $A^3$ , which form seats therefor. The lugs  $h^{15}$  and  $h^{16}$ , engaged by the screw-bolt  $h^{18}$ , are arranged so as to permit of the tightening or loosening of the lower bearing blocks  $h'$ , suitably connected with the journals of the lower tightening rolls of the rub-aprons for maintaining the respective aprons under the proper longitudinal tension.

On the eccentric side of the machine as clearly illustrated in Fig. 1, the respective journals  $e^2$  and  $e^3$ , of the tightening rolls  $e$  and  $e'$ , of the rub-aprons D and D', are extended beyond the bearing blocks  $h$  and  $h'$ , and engage with the end oblong slotted yokes  $f$  and  $f'$ , of spanning frames F and F'. These frames are provided with projecting studs or pins  $f^2$  and  $f^3$ , for engaging the straps  $g$  and  $g'$ , of eccentrics G and G', which are suitably journaled to a vertical shaft  $G^2$ , the shaft  $G^2$ , being held in the bearings  $a^{10}$  and  $a^{11}$ , of brackets or arms  $A^5$  and  $A^6$ , secured at the top and bottom of the end standard A. To the journals of the intermediate rolls of the rub-aprons on the eccentric side of the machine, as shown in Fig. 1 are mounted sleeves  $g^4$  and  $g^5$ , provided with slotted lugs or projections  $g^7$  and  $g^8$ , engaging by means of pins or bolts



5  $g^9$ , the slotted lugs or projections  $g^{10}$  and  $g^{11}$ , formed integral with the spanning frames F and F', these sleeves, projections, &c., being shown in Fig. 1, in connection with only a part of the intermediate rolls for the sake of greater clearness.

10 The ends of the respective journals  $e^2$ ,  $e^3$ ,  $e^{11}$  and  $e^{12}$ , of the tightening rolls are provided with end washers  $e^{13}$ , and with nuts  $e^{14}$ , on the eccentric side of the machine for preventing end displacement of the same in connection with the bearing blocks  $h$  and  $h'$ , as well as in connection with the sleeves  $g^4$  and  $g^5$ , and the respective yokes of the spanning frames F and F', of the machine, shown in Fig. 1. The journals of the intermediate rolls  $e^{21}$  and  $e^{22}$ , are provided with bushings, bearings or boxes  $e^{11}$  and  $e^{12}$ , in which they are afforded a range of back and forth movement in the length of the rolls.

20 By reference to Fig. 1, and from the foregoing explanation, it will be observed that the end journals of the said tightening and intermediate rolls are attached to the said spanning frames F and F', in such manner as to prevent endwise movement independently of said frame, although permitted to rotate in their connection therewith and in the manner hereinbefore fully described.

30 It will be observed by reference to Fig. 1, that the end bearing yokes  $f$  and  $f'$ , of the spanning frames F and F', are provided with oblong longitudinal slots, while the intermediate bearing yokes  $f^{12}$  and  $f^{13}$ , are provided with vertical oblong slots in order that the journals  $e^2$ ,  $e^3$ ,  $e^{21}$  and  $e^{22}$ , of the respective rolls may be properly adjusted in the said yokes.

40 By the hereinbefore described arrangement of the respective aprons D and D', they are maintained firmly in contact with each other, so that the sliver or slubbing in passing between them through the rotary and reciprocating motions given thereto is formed into roving and delivered therefrom.

45 The operation of the machine for the transforming of the sliver or slubbing into roving, is as follows:—The fibrous material is fed from the doffer-cylinders B, and passes to the doffer-rolls C, and then to the respective aprons D and D', rotating in the direction of the arrows, as indicated in Figs. 1 and 2, and by the actuation of the eccentrics for imparting reciprocating motions to said aprons, the sliver or slubbing is formed into roving and discharged from the aprons for subsequent treatment or use.

60 Having thus described the nature and objects of my invention, what I claim as new, and desire to secure by Letters Patent, is—

65 1. The combination, in a condenser or finisher carding machine, of rub aprons, tightening and intermediate rolls therefor having end journals, bushings or boxes through which extend the end journals of the tightening rolls, bearing blocks on both sides of the machine

for said bushings or boxes, spanning frames having end and intermediate yokes in which are secured the end journals of the said rolls, means for adjusting the journals of the tightening rolls in a longitudinal direction, means for adjusting the journals of the intermediate rolls in a vertical direction and actuating means for said rolls and spanning frames, substantially as and for the purposes set forth. 75

2. The combination, in a condenser or finisher carding machine, of standards provided with cross frames, rub aprons, tightening and intermediate rolls therefor having end journals, bushings or boxes through which extend the end journals of the tightening rolls, bearing blocks on both sides of the machine for said bushings or boxes, spanning frames having yokes in which are secured the end journals of the said rolls, means for longitudinally adjusting the journals of the tightening rolls, means for vertically adjusting the journals of the intermediate rolls, means for preventing end displacement of said journals, and actuating means for said rolls and spanning frames, substantially as and for the purposes set forth. 80 85 90

3. The combination, in a condenser or finisher carding machine, of standards having cross-frames secured thereto, upper and lower rub aprons, tightening and intermediate rolls therefor provided with end journals, bushings or boxes through which extend the end journals of the tightening rolls, bearing blocks connected with said cross-frames on both sides of the machine, for said bushings or boxes, means for vertically and longitudinally adjusting the bearing blocks of the tightening rolls of the upper rub apron, the said means comprising bearing posts working in ways provided in said cross-frames, vertical and longitudinal screw bolts passing through said bearing posts and having tightening nuts, and back stops and lugs against which bear the ends of said screw bolts, means for longitudinally adjusting the bearing blocks of the tightening rolls of the lower rub apron, the said means comprising longitudinal arms  $h^{13}$  and  $h^{14}$ , connected to said bearing blocks and provided with lugs  $h^{15}$  and  $h^{16}$ , and screw bolts connecting said lugs, spanning frames having yokes for the end journals of the rolls, means for adjusting the end journals of the tightening and intermediate rolls in their respective yokes and actuating means for said rolls and spanning frames, substantially as and for the purposes set forth. 95 100 105 110 115 120

4. The combination with a rub-motion mechanism, of a standard provided with oblong slotted hangers and a yoke with a slot therein, a doffer-roll provided with end journals detachably supported in said hangers, a gear mounted on one of the journals of said roll, a shaft having a doffer-cylinder mounted thereon and provided with a gear, a movable arm mounted on said shaft and having at its free end a gear which is journaled thereto 125 130



said gear connecting the gears of the doffer-  
roll and doffer cylinder, and means engaging  
through said slotted yokes with said movable  
arm for locking the same in required posi-  
5 tion, substantially as and for the purposes set  
forth.

In testimony whereof I have hereunto set

my signature in the presence of two subscrib-  
ing witnesses.

JOHN CROMIE.

Witnesses:

J. WALTER DOUGLASS,  
THOMAS M. SMITH.