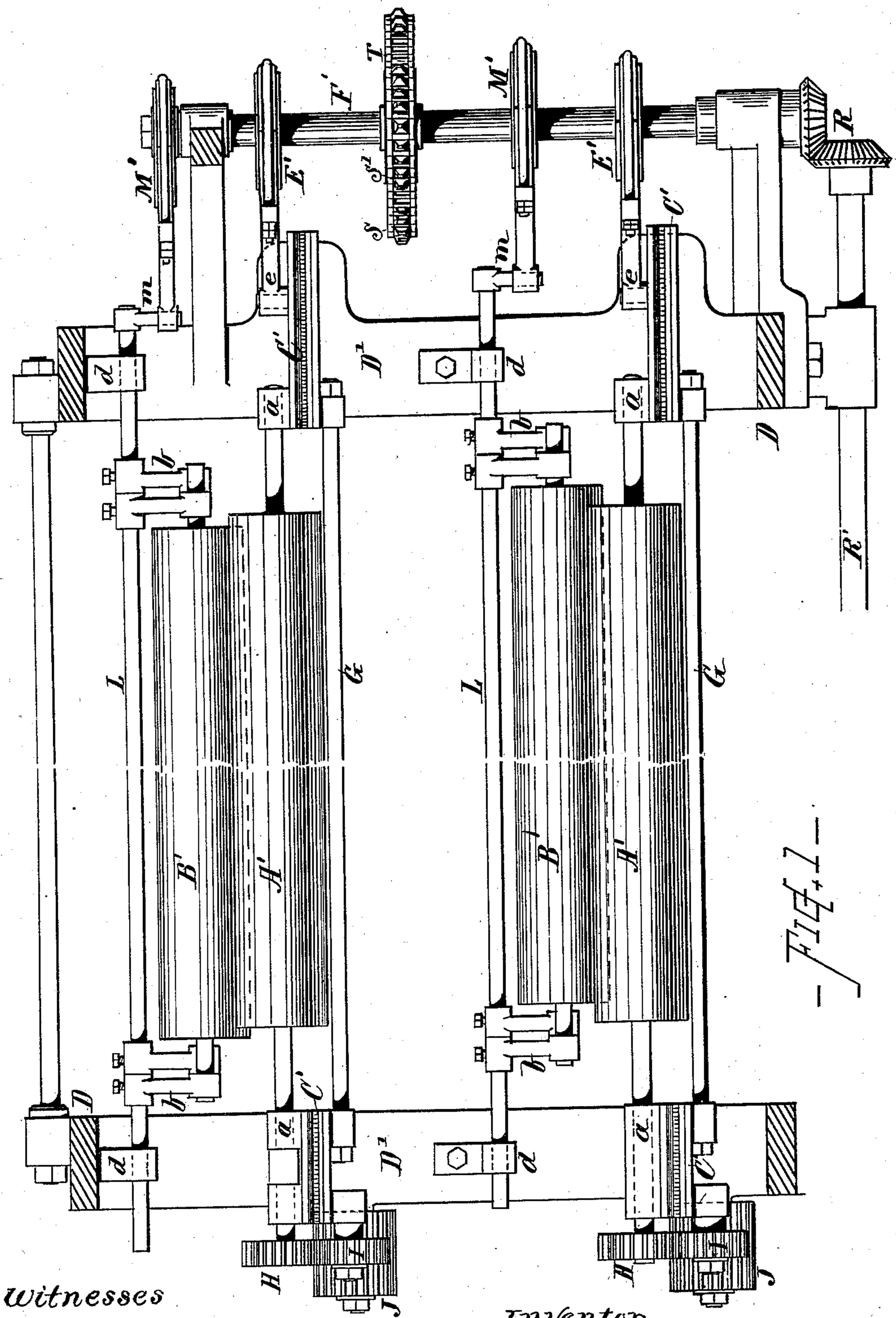
(No Model.) 2 Sheets—Sheet 1.

G. FOWLER.

CONDENSER FOR CARDING MACHINES.

No. 308,836. Patented Dec. 2, 1884.



Witnesses

Austin W. Mathews
Chas. D. Gray.

Inventor

George Fowler
By Chas. A. Burleigh Atty.

N. PETERS. Photo-Lithographer, Washington, D. C.

(No Model.) 2 Sheets—Sheet 2.

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FIG. 2

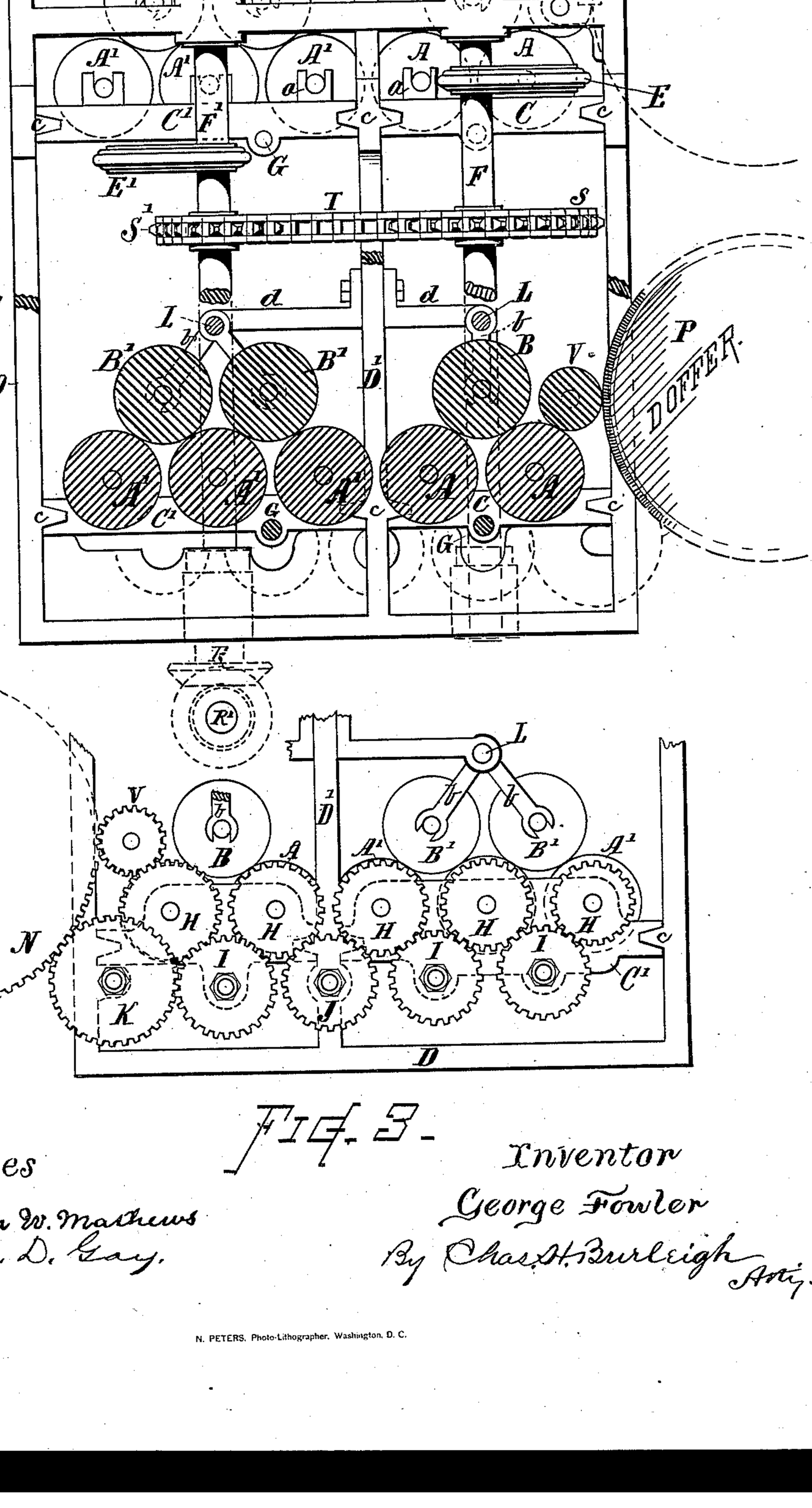

FIG. 3.

Witnesses

Austin W. Mathews
Chas. D. Gary.

Inventor
George Fowler
By Chas. H. Burleigh
Atty.

N. PETERS, Photo-Lithographer, Washington, D. C.

UNITED STATES PATENT OFFICE.

GEORGE FOWLER, OF PHILMONT, NEW YORK, ASSIGNOR TO SILAS W. GODDARD AND ANNA R. CLEVELAND, OF WORCESTER, MASSACHUSETTS.

CONDENSER FOR CARDING-MACHINES.

SPECIFICATION forming part of Letters Patent No. 308,836, dated December 2, 1884.

Application filed April 23, 1883. (No model.)

To all whom it may concern:

Be it known that I, GEORGE FOWLER, of Philmont, town of Claverack, in the county of Columbia and State of New York, have invented certain new and useful Improvements in Condensers for Carding-Machines; and I declare the following to be a description of my said invention sufficiently full, clear, and exact to enable others skilled in the art to which it appertains to make and use the same, reference being had to the accompanying drawings, which form a part of this specification.

The object of my present invention is to provide a condensing mechanism for carding-machines having independently-acting sets of rolls for effecting a uniform fulling or condensing of the roving, or for imparting a duplex rolling action to prevent the roving from becoming split or separated while it passes through the condenser; to afford means for reciprocating the supporting-boxes at both ends of the machine, together with the rolls and driving-gearings; to provide means for reciprocating the different sets of rolls at different degrees of speed; also, to avoid the necessity of splining the roll-shafts and sliding them within their driving-gears. These objects I attain by mechanism constructed and organized for operation substantially as illustrated and described, the particular subject-matter claimed being hereinafter definitely specified.

In the drawings, Figure 1 is a longitudinal sectional view of a card-condenser illustrating the nature of my invention. Fig. 2 is a part end view, part transverse section of the same, showing the arrangement of the rub-rolls and reciprocating mechanism and the relative location of the mechanism as regards the doffers of the carding-machine. Fig. 3 is an end view showing the arrangement of the roll-driving gears.

My improved condenser is combined with the carding-machine in such manner as to take the web or roving from the doffers, substantially as it is taken by the ordinary condensers. The rub-rolls are arranged in two independently-operated series. The first series, or those nearest to the doffer, is in the present instance composed of two bottom rolls, A, and one top roll, B, while the second series is composed of three bottom rolls, A′, and two top rolls, B′. I do not, however, desire to confine myself to any exact number of rolls, and a greater or less number could be employed in each separate series without changing the nature of my invention. The bottom rolls, A and A′, are mounted to turn in bearings *a*, supported on sliding box frames or gates C C′, that work on suitable horizontal guideways, *c*, on the main supporting-frame D, and to which reciprocating movement is separately imparted by connections *e* from eccentrics E and E′, fixed on the vertical shafts F and F′, arranged at one end of the frame D, as indicated, which shafts are operated at different speeds of revolution. The boxes or sliding gates C C and C′ C′ at opposite ends of the machine are, in each of the respective series or roll sets, connected one with the other in pairs by bars or rigid connections G, so that the boxes at both ends will move together and be reciprocated by the action of the eccentrics at one end of the machine, and without draft on the roll-axles. The frame D has an intermediate upright, D′, between the sections, for supporting the guides at the inner edges of the gates C C′. The driving-gears H are fixed on the bottom roll-journals, and the intermediates I are supported on studs attached to the reciprocating boxes or gates C C′, so that all of said gears move with the reciprocation of the rub-rolls A A′. The intermediate gear, J, and first power-gear, K, are mounted on studs attached to the main frame, and said gears J and K are made with a width of face sufficiently in excess of the width of the gears I to accommodate the reciprocative action of the rolls A A′; or, in other words, the width of gears J and K must equal the width of gears I plus the throw of the eccentric, so that the teeth of the gears I can slide longitudinally on the teeth of gears J and K with the movement of the rolls and boxes without unmeshing said gears. The top rolls B and B′ are mounted in or retained by bearing-arms *b*, supported on rods or carriers L, arranged across the machine and above the rolls, and parallel with their axes in the supporting hangers or bearings *d*, and having a reciprocative movement by the action of the eccentrics M M′, to which said carriers L are

connected, as indicated at *m*, Fig. 1, or in other equivalent manner. The top rolls are not in the present instance provided with driving-gears, but are arranged to receive their rotative action by friction from the bottom rolls. However, if desired, said rolls could be provided with gears similar to the bottom rolls. Motion is imparted to the gear K, and thence to the several rolls, from a gear, N, on the shaft of the doffer P, or in other suitable manner, if preferred. The vertical eccentric shaft F′ is operated by gears R from a shaft, R′, extending across the under part of the condenser, which shaft R′ is connected for operation with the carding machinery in any convenient suitable manner. The vertical shaft F′ operates the vertical shaft F by means of the sprocket-wheels S S′ and drive-chain T. The wheels S and S′ are made of different diameters, so that the two series of rolls A B and A′ B′ will reciprocate at different degrees of speed, the first series, A B, having a long slow stroke or endwise movement to put the web into a rope, while the second series, A′ B′, has a short quick stroke to condense or full the roving close, uniformly, and compactly. In the present instance the proportional speed of reciprocation is three movements of the rolls A′ B′ during two movements of the rolls A B. This relative proportion of reciprocatory speed may, however, be changed if it is found in practice that other relative speeds are better suited to the requirements of the work or to particular varieties of stock operated upon. The web or roving is taken from the doffer P to the first rub-roll, A, by the wiper-roll V. The covering material for the several rolls may be such as ordinarily used for card-condensers. If desired, more than two sets of rolls could be used, the arrangement of additional sets being substantially similar to those described.

In the operation the roving passes from the doffer P to the first set of rolls, A B, from thence to the second set, A′ B′, and from thence to the spools, which latter may be arranged in the ordinary manner. The action of the two sets of rub-rolls prevents the roving from becoming split and running off in two strands where only one should be, and the second set of rolls condenses and perfects any looseness or derangement in the roving that has escaped the action of the first set of rolls, thus forming a better quality of roving, and obviating much subsequent annoyance and waste by the breaking of the roving while undergoing the spinning operation.

What I claim as of my invention, and desire to secure by Letters Patent, is—

1. A condenser for carding-machines having for each row of rovings a plurality of independent series of rub-rolls, cam-shafts, and cams thereon, and connecting devices intermediate of said cams and rub-rolls, and mechanism for operating said cam-shafts, whereby reciprocating motion at relatively different rates of speed is imparted to said series of rub-rolls, substantially as and for the purpose set forth.

2. The rub-rolls disposed in a plurality of independent series, in combination with separate cam-shafts for each of said series having cams of different throw, connecting devices intermediate of said cams and rub-rolls, and mechanism for rotating said shafts at severally different velocities, whereby reciprocative motions at relatively different rates of speed and to relatively different limits of movement are severally imparted to said series of rolls, substantially as and for the purposes set forth.

3. The combination, with the doffer of a carding-machine and the first and second series of condensing-rolls, of mechanism for imparting to each of said series of rolls a reciprocating motion, the latter series being reciprocated at a shorter and quicker stroke than the former series, substantially as set forth.

4. The combination, with the rub-rolls, of journal-supporting boxes at both ends of said rolls, end frames provided with journal-box-supporting guides, a bar or rigid connection joining to each other the journal-supporting boxes at opposite ends of said rolls, and mechanism for reciprocating said rolls and journal-boxes, as and for the purpose set forth.

5. The combination of the rolls A and A′, the frames provided with guides for gates, the gates C and C′, provided with journal-boxes *a*, the top rolls, B and B′, their retaining-bearings *b*, the carrier-rod L, the shaft F, provided with eccentrics E M, the shaft F′, provided with eccentrics E′ M′, and the connections *e* and *m*, substantially as and for the purpose set forth.

6. The combination, with the independent series of rub-rolls and the supporting-gates provided with journal-boxes, of gears H, rigidly fixed upon the journals of said rolls, the gears I, mounted on the supporting-gates, the frame of the condenser, the gears J and K, mounted on said frame, and mechanism for reciprocating the supporting-gates, substantially as set forth.

7. The combination, with the series of rub-rolls A B and A′ B′ and operating-shafts F and F′, the eccentrics E M and E′ M′, and devices intermediate said eccentrics and rub-rolls, of the sprocket-wheels S and S′ of different diameters, and the drive-chain T, as shown and described.

Witness my hand this 31st day of March, A. D. 1883.

GEORGE FOWLER.

Witnesses:
W. FRANK P. CHACE,
L. PRYCE TILDEN.