

(No Model.)

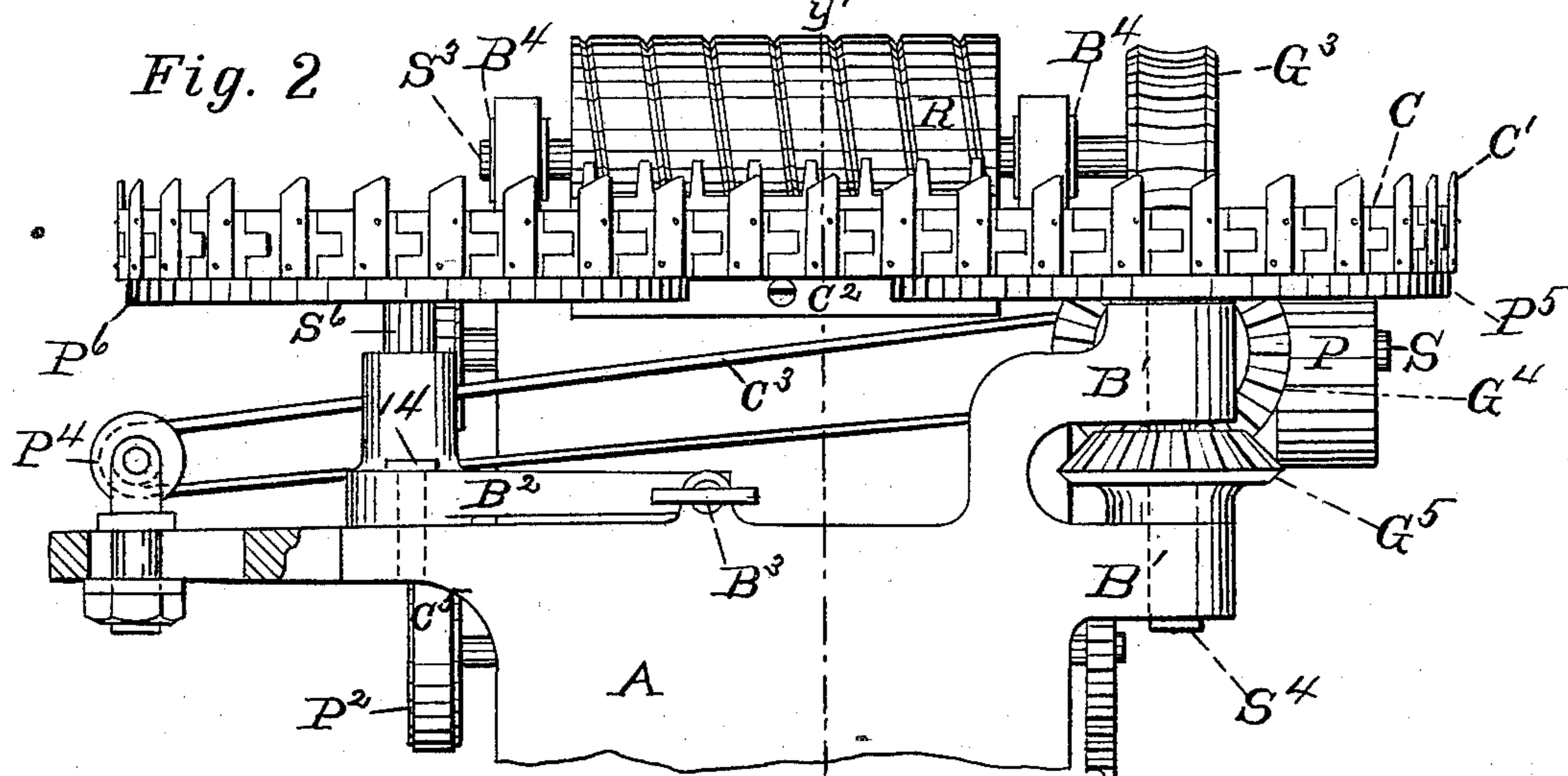
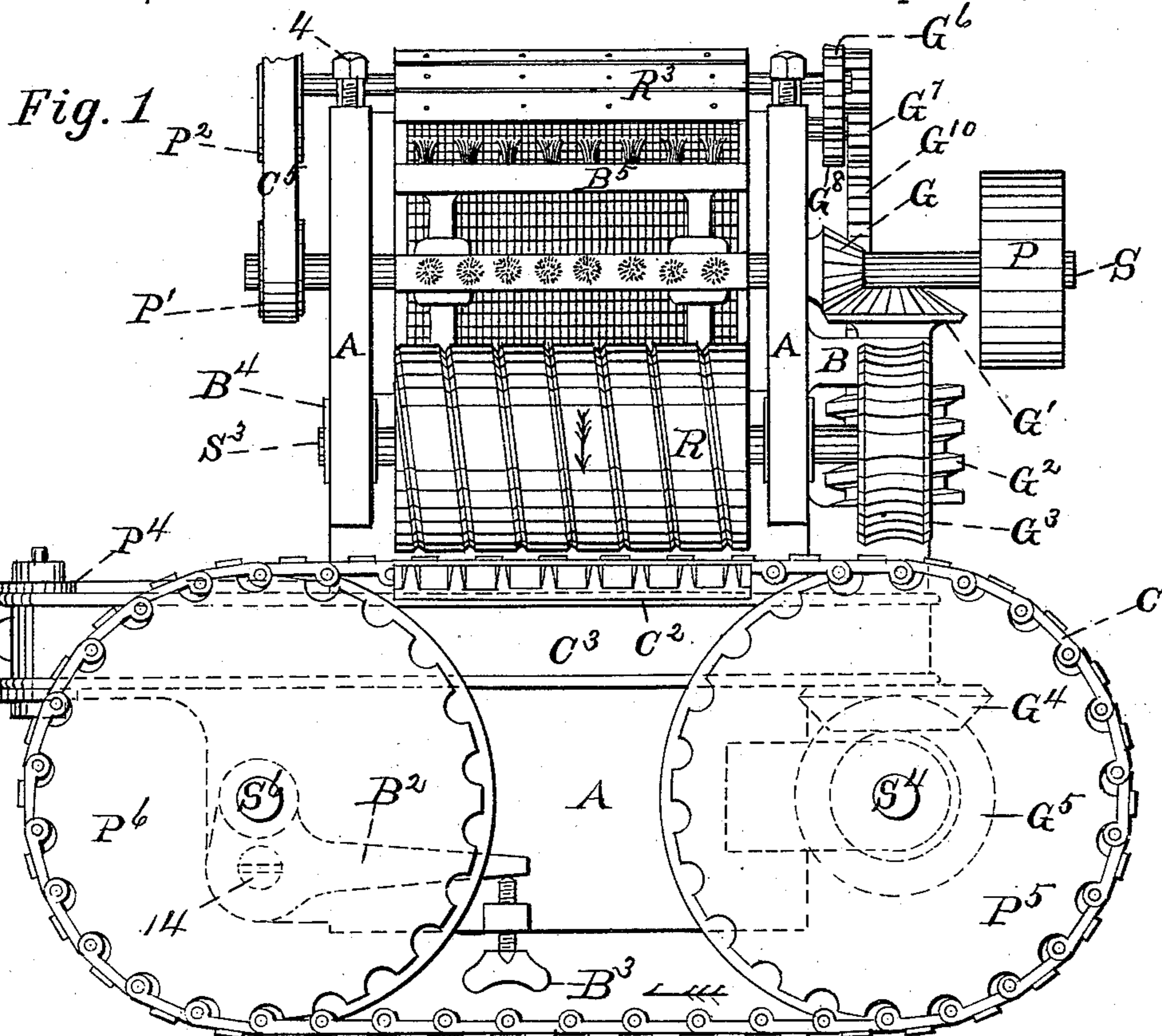
3 Sheets—Sheet 1.

F. H. RICHARDS.

COTTON GIN.

No. 305,232.

Patented Sept. 16, 1884.



Witnesses.

H. W. Faulkner

L. O. Palmer.

Inventor.

Francis H. Richards.

(No Model.)

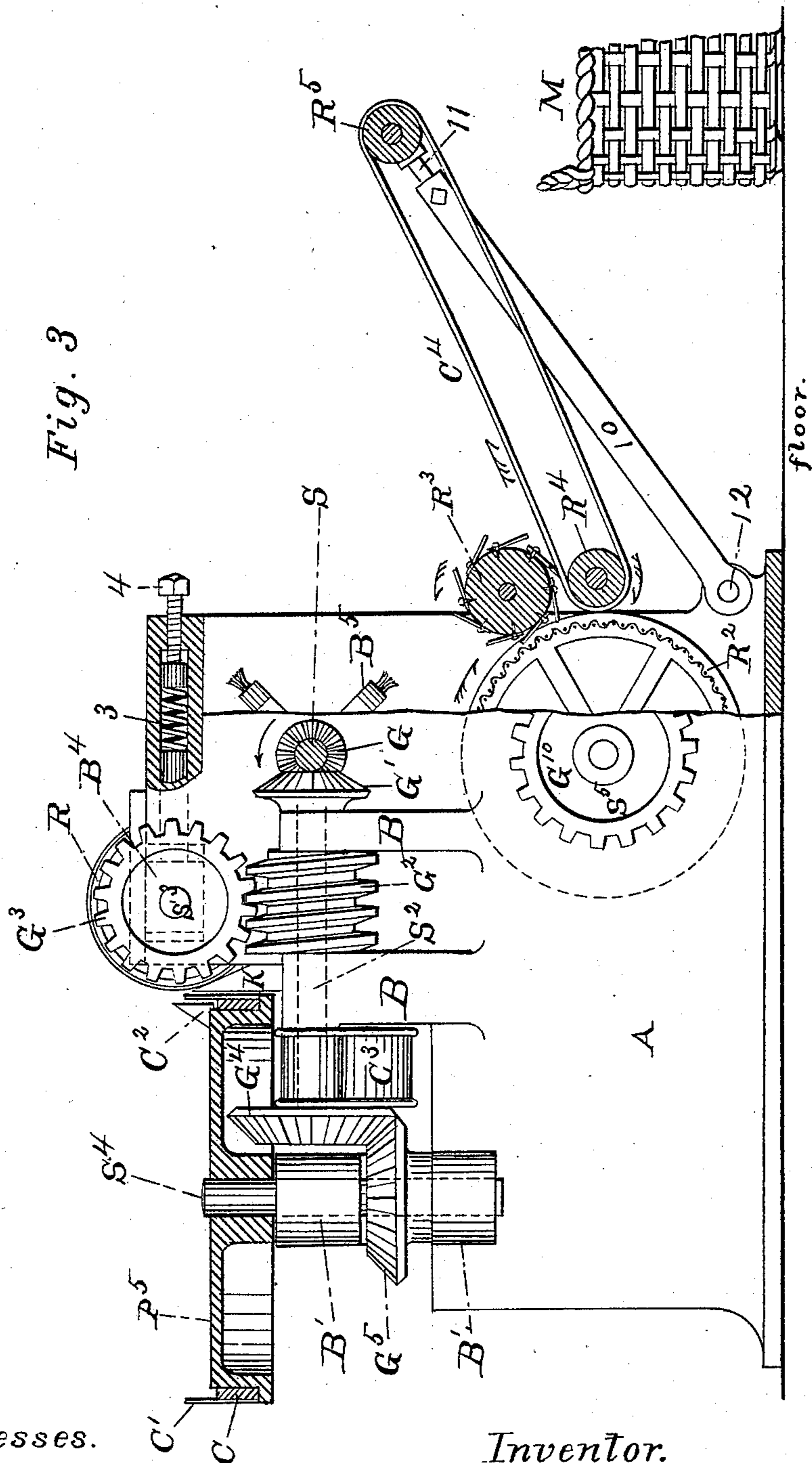
3 Sheets—Sheet 2.

F. H. RICHARDS.

COTTON GIN.

No. 305,232.

Patented Sept. 16, 1884.



Witnesses.

H. W. Faulkner
C. O. Palmer

Inventor.

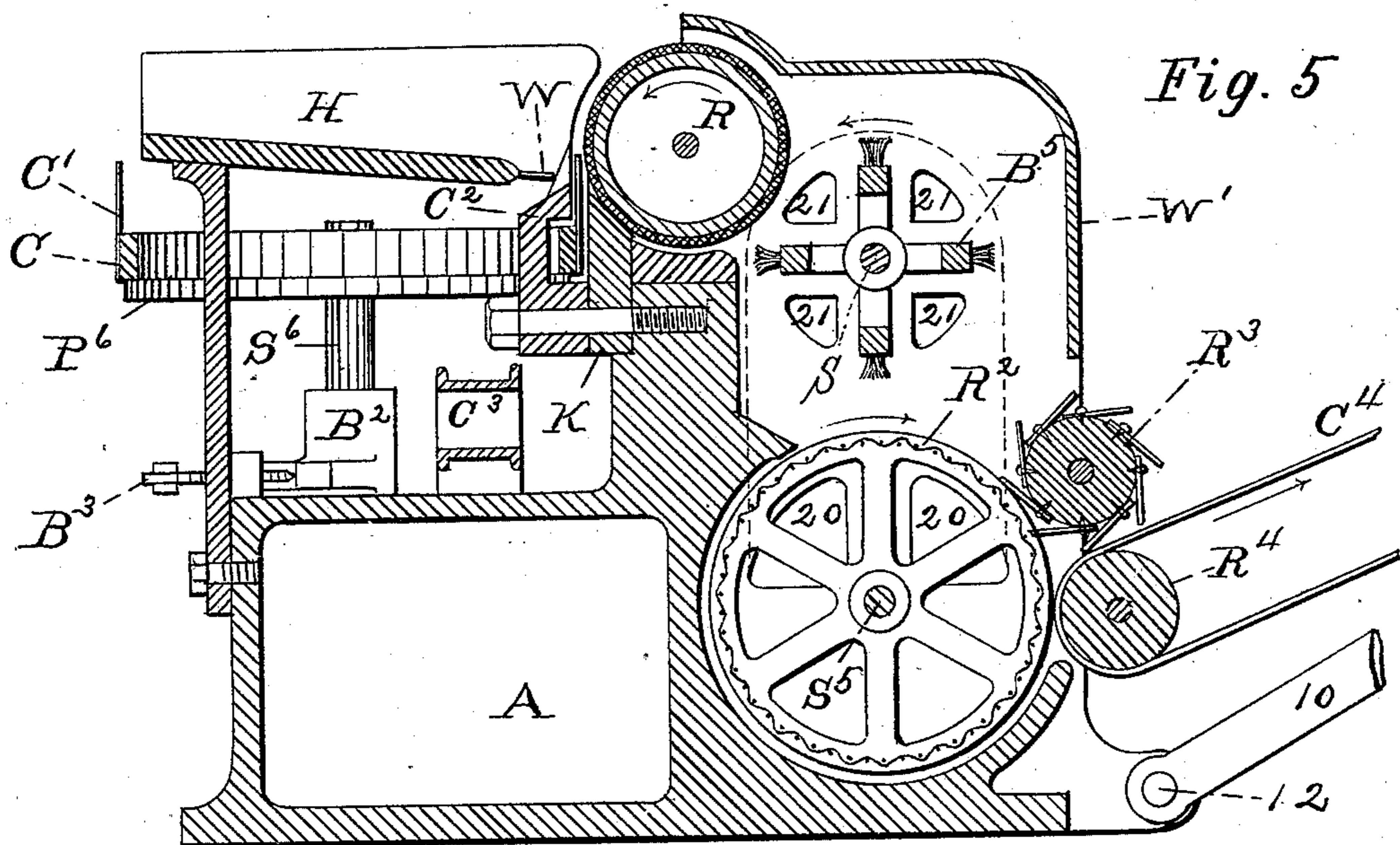
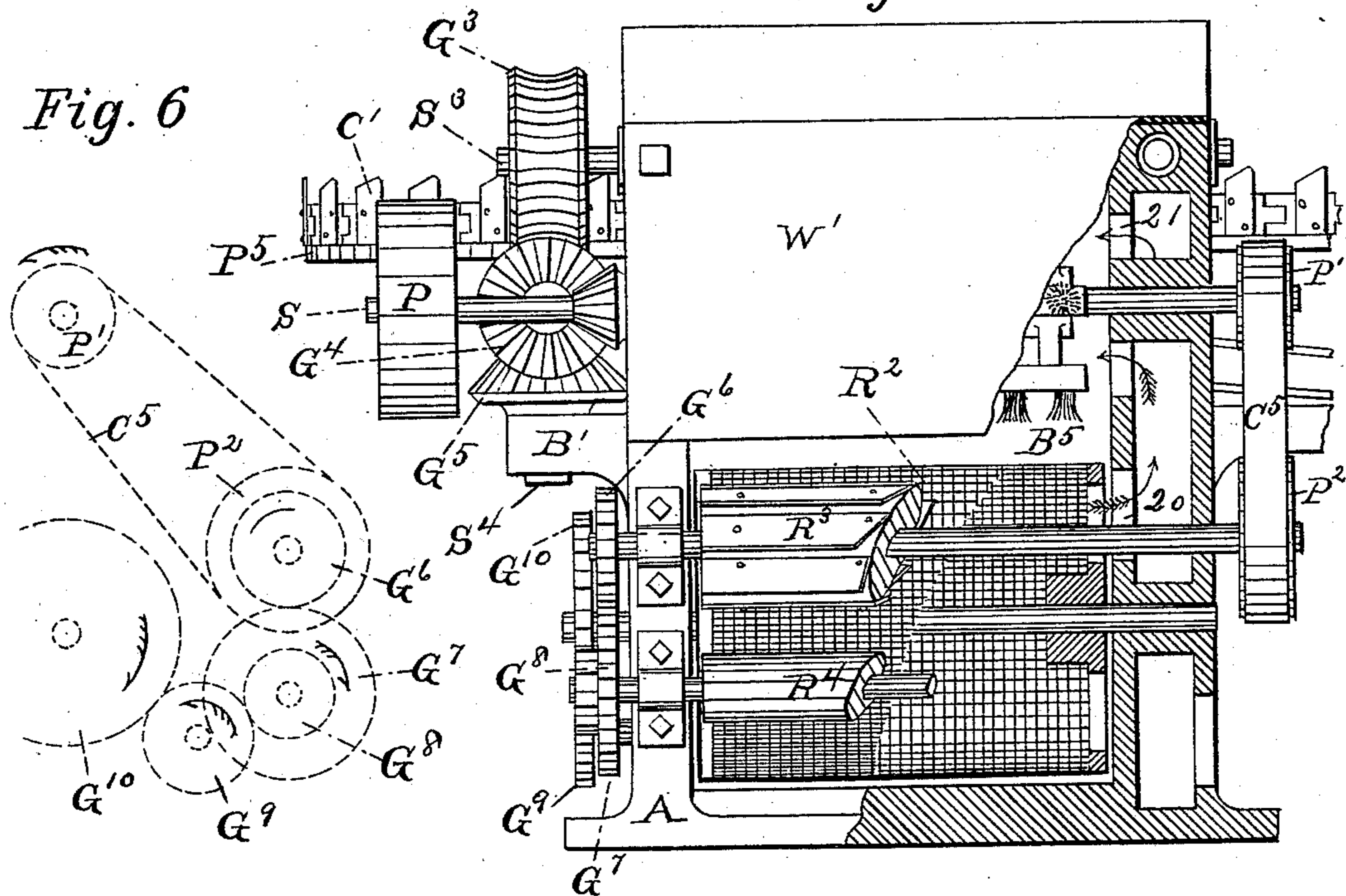
Francis H. Richards.

3 Sheets—Sheet 3.

COTTON GIN.

Patented Sept. 16, 1884.

Fig. 4



Inventor.

Francis H. Richards.

L. O. Palmer.

UNITED STATES PATENT OFFICE.

FRANCIS H. RICHARDS, OF SPRINGFIELD, MASSACHUSETTS, ASSIGNOR TO
THE PRATT & WHITNEY COMPANY, OF HARTFORD, CONNECTICUT.

COTTON-GIN.

SPECIFICATION forming part of Letters Patent No. 305,232, dated September 16, 1884.

Application filed December 31, 1883. (No model.)

To all whom it may concern.

Be it known that I, FRANCIS H. RICHARDS, a citizen of the United States, residing at Springfield, in the county of Hampden and State of Massachusetts, have invented certain new and useful Improvements in Cotton-Gins, of which the following is a specification, reference being had to the accompanying drawings.

My invention, which relates to that class of roller-gins having an endless seed-clearer, will first be described in connection with the drawings, and then specially pointed out in the claims.

Figure 1 is a plan view of a machine embodying my invention, in which the brush-space cover, the delivery-belt, &c., are removed. Fig. 2 is a front elevation of the upper part of the machine, the feed-board being removed. Fig. 3 is a side elevation, partially in section. Fig. 4 is a rear elevation, also partially in section. Fig. 5 is a vertical section in line *yy* of Fig. 2. Fig. 6 is a diagram drawn in projection from Fig. 4, showing the arrangement of certain gearing of the machine.

Similar letters refer to similar parts throughout the several views.

The frame of the machine, A, is made preferably of a box-shaped form, with suitable projections, bearings, &c., for carrying the several details of the machine. The principal driving-shaft S has its bearing formed in the walls of the frame, and is driven by means of a band (not shown) upon a pulley, P, which is rigidly fixed to said shaft. A second driving-shaft, S², has bearings formed in the projections B B, and receives motion from shaft S by means of gears G and G'. A friction-roll, R, of the usual description is secured upon a shaft, S³, which is supported in sliding bearings B⁴—one at each end thereof—and receives motion from shaft S² in the direction of the arrow by means of the screw-gears G² and G³. The sliding bearings B⁴ are pressed forward by means of springs 3, which are compressed by screws 4 or by a weighted lever. A fourth shaft, S⁴, is supported in a position vertical to shaft S² by projecting bearings B⁷, and carries upon its upper end a driving band-wheel, P⁵, and receives motion from shaft S²

by means of any suitable gearing—as, for instance, the bevel-wheels G⁴ and G⁵.

Upon the frame A, opposite to shaft S⁴, (see Fig. 1,) a swinging piece, B², is pivotally secured, for carrying the stud S⁶, upon which the idler band-wheel P⁶ is adapted to revolve freely. This swinging piece B² is adapted to swing upon a pivot-screw, 14, so as to move the stud S⁶ away from shaft S⁴ by means of screw B³. These two band-wheels P⁵ and P⁶, which have flanges on the lower side of their rims for holding it up, are adapted to carry a continuous seed-clearer, which may be an endless band or a series of parts jointedly connected to form such a continuous clearer. One form of the latter construction is shown at C, Figs. 1, 2, 3, and 5, in which the said parts are made to form a chain of rectangular cross-section. Clearer-points C' are attached to one side thereof at suitable intervals, and may be readily renewed when worn out. A doctor-knife, K, and a guard-plate, C², (see Fig. 5,) are suitably fixed in the machine relative to each other and to roll R, and the clearer C is adapted to run in a space formed between them, preferably in the guard-plate. This guard-plate is constructed to reach over and above the clearer C and come close to the side of the clearer-points C', to properly support them to the roll R, and prevent the mass of cotton lint from forcing said points so far away from said roll as to render them inoperative. The clearer-points C', before mentioned, are so made or adjusted as to project somewhat above the upper edge of the knife K—say about one-fourth of an inch in ordinary practice. The rotation of the band-wheels causes the clearer-points to pass along in front of the roll R and to beat off the seeds from the lint. The usual feed-board, H, is provided to enable the operator to properly feed the seed-cotton to the friction-roll R, and it has the usual grating, W, through which the ginned seed may fall upon the seed-carrier and be delivered out of the machine. Below the band-wheels, and preferably directly under the grating of the feed-board, is placed a suitable seed-carrier, C³, to catch the falling seed and convey it out of the machine-box or other receptacle for final removal.

The principal driving-shaft S, referred to in the earlier part of this specification, it will be observed carries a revolving doffer, which consists of a series of brushes, B⁵, for removing the cotton fiber from the friction-roll, and which, by their rapid rotation, act to reduce the cotton from the matted form in which it leaves the roll to a condition more light and open. The bars of these brushes, being flat and arranged radially to the driving-shaft, act upon the air contained in the brush-space upon the principle of a fan-blower, thereby causing an air-blast to blow the cotton off from the brushes and onto the condenser-cylinder R². The rotation of this brush also creates, as will be obvious from the drawings, a current of air from within the condenser through openings 20 into the hollow side of the frame, and out of the latter through openings 21 to the space within the series of brushes. This current of air assists in the formation of the loose cotton fiber into a bat upon the said cylinder. Back of the condenser are placed two rollers, R³ and R⁴, of which the former has a series of leather flaps of the usual description, substantially as shown, for condensing the bat of cotton fiber, and which is driven from shaft S in a reverse direction to the condenser R² by means of pulleys P¹ and P² and belt c⁵. The lower roller, R⁴, is driven from shaft of roller R³ by means of gears G⁶ and G⁷ in the same direction as the said condenser-cylinder, and is located close to the latter. The condenser-shaft S⁵ is driven from roller R⁴ by means of gears G⁸, G⁹, and G¹⁰, of which the first is on roller R⁴. The second is an intermediate gear, and the last is fixed on shaft S⁵. The arrangement of this gearing is shown best by the diagram in Fig. 6, which is drawn in projection from Fig. 4. The purpose of the roller R⁴ is to turn the condensed bat-cotton away from the condenser-cylinder and guide the same out of the machine.

In order to deliver the bat into any suitable receptacle, as basket M, the roller R⁴ is provided with an endless delivery-belt, C⁴, the outer end of which is adjustably supported by means of idler-roller R⁵, swivel-bearings (not shown) in the forked-adjusting rods 11, and braces 10, which are pivotally secured at 12 to the frame of the machine. A cover, W¹, is provided to inclose the brush-space and prevent the lint from being blown away by the air-currents from the brushes.

The operation of my improved roller cotton-gin is as follows: Power is applied to the machine by means of a band upon pulley P, thereby causing the driving-shaft S to revolve rapidly in the direction of the arrow in Fig. 3. By means of the gearing and other mechanism described suitable motion is imparted to the clearer C and roll R, as indicated by the arrows upon those parts in Fig. 1, and to the condenser R², rolls R³ and R⁴, and belt C⁴ in the direction shown by the arrows in Figs. 3 and 6. The exact relative velocity of these several motions I do not consider essential, but prefer them to approximate those now employed for similar motions in other cotton-working machines.

The several parts of the machine being in proper adjustment, seed-cotton is fed to the friction-roll in the usual manner. This roll draws the lint down between itself and the doctor-knife, and the seeds are beat off by the rapid blows given them by the clearer-points C¹, and fall through the grating of the feed-board. The lint, being pulled from the seed, is then carried under the roll R, whipped out by the rapidly-revolving brushes, and blown onto the condenser-cylinder, where it is formed into a bat and carried out of the machine, as hereinbefore mentioned.

The operation of forming and disposing of the bat of cotton lint in my machine is similar to that operation as now performed by the condensers used with saw-gins.

Having thus described my invention, I claim—

1. In a cotton-gin, a suitable ginning mechanism, a condenser mechanism having a perforated cylinder, an air-passage leading from within said cylinder to within a revolving doffer, and the said revolving doffer, combined and operating substantially as described.
2. In a cotton-gin, in combination, a friction-roll and a doctor-knife, flanged band-wheels P⁵ P⁶, the seed-clearer band C, having points C¹ upon one side thereof, and guard-plate C², adapted to support said points to said roll and having a channel for inclosing said seed-clearer band, substantially as described.

FRANCIS H. RICHARDS.

Witnesses:

GEO. A. REYNOLDS,
C. O. PALMER.