

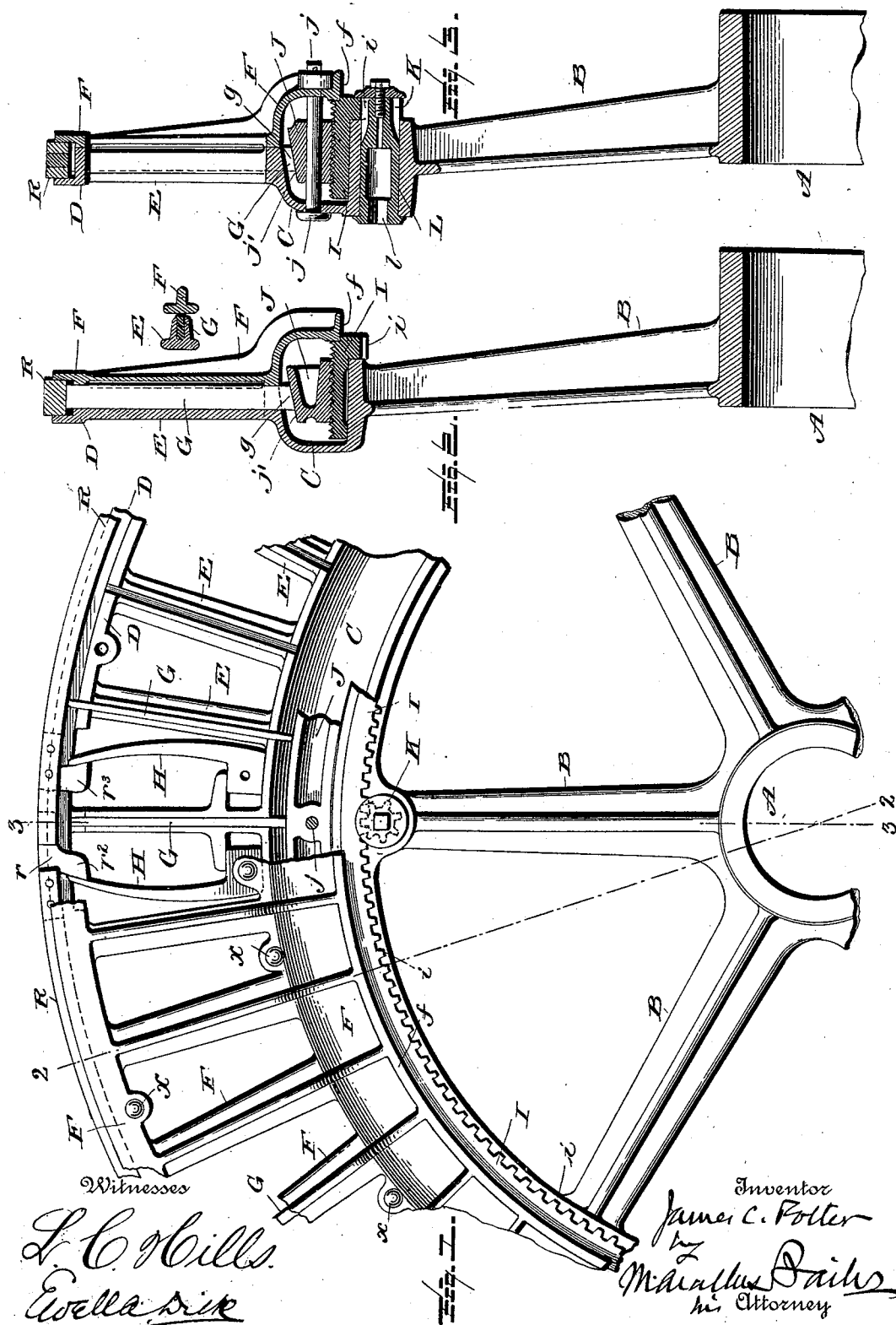
(No Model.)

2 Sheets—Sheet 1.

J. C. POTTER.  
CARDING ENGINE.

No. 519,640.

Patented May 8, 1894.



Witnesses  
L. C. Hills  
E. W. Hill

Inventor  
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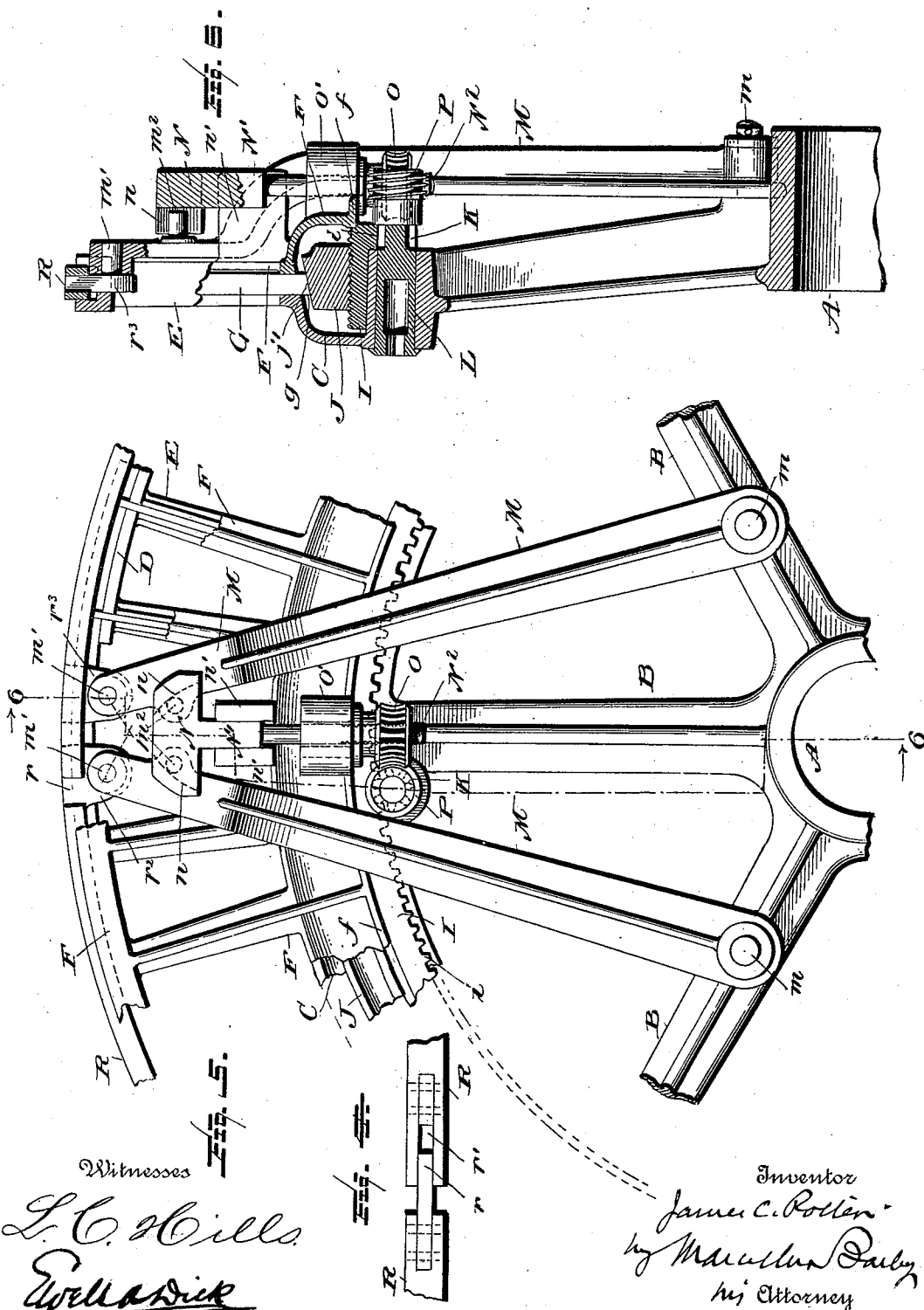
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*L. C. Mills*  
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Inventor

*James C. Potter*  
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# UNITED STATES PATENT OFFICE.

JAMES C. POTTER, OF PAWTUCKET, RHODE ISLAND.

## CARDING-ENGINE.

SPECIFICATION forming part of Letters Patent No. 519,640, dated May 8, 1894.

Application filed January 25, 1894. Serial No. 497,974. (No model.)

*To all whom it may concern:*

Be it known that I, JAMES C. POTTER, residing in Pawtucket, in the State of Rhode Island, have invented a new and useful Improvement in Carding Engines or Machines, of which the following is a specification.

My invention has reference to what are known as revolving flat carding engines, and it relates to the device for supporting the moving flats which co-operate with the carding cylinder. This device consists usually of a wheel or circle placed one at each end, and outside, of the cylinder. In some cases this device revolves with the flats, having its axis of revolution coincident with the axis of the carding cylinder, and in this case it is usually termed a wheel; in other cases the device—which sometimes is only a segment of a wheel—is fixed and the cards slide on it, and in this case it is termed a circle.

I shall term the device which I have invented a wheel, for convenience sake; but I desire to be understood as including in that term both a wheel and a circle as those terms are used in the technical signification above expressed.

In devices designed for this purpose, it is necessary to provide some means for securing and retaining the proper adjustment or relation between the clothing on the flats and that on the cylinder. The teeth wear away in use, and as a consequence of such wear they must be readjusted with relation to each other.

It is my object to produce a wheel which can be used over and over again with flats, and which can be conveniently, accurately and expeditiously adjusted from time to time as occasion may require to conform to the requirements of the work.

To this end my invention consists of an improved combination and arrangement of devices which will now be described in connection with the accompanying drawings, and will then be more particularly pointed out in the claims.

In the drawings—Figure 1 is a side elevation of a portion of the wheel, with parts broken away to expose the working devices within. Fig. 2 is a section on line 2—2, Fig. 1. Fig. 3 is a section on line 3—3, Fig. 1. Fig. 4 is a plan of the joint between the two

ends of the ring. Fig. 5 is a side elevation of a portion of a wheel with a modified form of adjusting mechanism. Fig. 6 is a sectional elevation on line 6—6, Fig. 5.

A is the hub of the wheel. From it extend spokes B which support at their outer ends an annular box C.

D is the rim of the wheel; and E are radial arms or posts extending between the rim and the box. The diameter of the wheel is usually about fifty inches. And in practice the hub A, spokes B, box C, rim D and radial posts E are formed of a single casting.

The adjustable flat-supporting ring is shown at R. It is seated in a peripheral recess in the rim, one side of which recess is bounded by removable plates or castings F, which at their bases form a cover for the box C. They are suitably bolted to the main casting at points *x*, &c., and also form a cover for one edge of the posts E. The posts are longitudinally recessed or grooved from top to bottom, forming guide ways for the reception of the spreaders or pushers G, which are plates or bars fitting and adapted to slide in said grooves, and bearing at their outer ends against the inner face of the ring R. There are some forty of these pushers—one for each post; and the ring therefore is acted on at numerous points, distributed at substantially equal intervals throughout its circumference. The covers F are applied to the side or edge of the posts in which the pusher grooves are formed. The ring R itself is a ring which is split crosswise at one point so as to permit it to spread and contract. At this point it has at one end a tongue *r* which enters a guide slot or groove *r'* in the other end. It will be seen that by moving the pushers outwardly, the ring will be expanded; while by retracting them or moving them inwardly the ring will be permitted to contract. In the arrangement shown in Fig. 1, the contraction of the ring is secured by spring arms H bearing against the exterior opposite faces of lugs *r*<sup>2</sup>, *r*<sup>3</sup> the one on one end and the other on the other end of the ring R, the spring set of these arms being such as to tend to draw the lugs together—thus contracting the ring. The ring is expanded by the pushers against the stress of these springs.

In the annular box C is an annular internal

gear I which encircles and is seated on the bottom of the box, and can revolve thereon. The internal gear teeth  $i$  of this part are outside of and below the bottom of the box. And the gear is held in place by the heels  $f$  of the covers  $F$ , which fit a recess formed in the upper and outer edge of the internal gear as shown. This rotatable internal gear I in turn is encircled by an annular adjusting block J, which by an internal screw thread engages a screw thread upon the exterior of the internal gear. The block is contained in the box C, and is of less width than the box, so that it can move back and forth therein crosswise of the wheel; it is held from rotation by cross bolts  $j$  on which it can slide. Under this arrangement it will be seen that when the internal gear is rotated the adjusting block will be moved crosswise of the wheel in one direction or the other according to the direction of rotation of the internal gear.

The heels of the sliding pushers G extend down into the box C, and meet and contact with the adjusting block. At their meeting points the block has an incline or bevel  $j'$  and the heels of the pushers are correspondingly inclined as at  $g$ . Consequently when the adjusting block moves in one direction it will thrust outward the pushers simultaneously and together thus causing them to expand the ring R, and when it moves in the other direction it will similarly allow the pushers to withdraw, and thus permit the ring to contract.

The rotation of the internal gear is secured by means of a pinion K, which meshes therewith and is fixed on a rotary spindle L properly secured in a cross bearing in the wheel, and furnished with a squared socket  $l$  for reception of a key or winch by which it may be turned or rotated. In this way by the movement of a single device located at a point on the wheel where it can be most readily got at, the ring can be adjusted easily and with very great accuracy.

In lieu of making the ring R spring-closing or contracting I can contract it positively by the action of devices whose motion for this purpose must of course be proportionate to that of the pushers. Such an arrangement is represented in Figs. 5 and 6—the wheel with this exception being the same as the one already described. The springs are dispensed with, and in lieu thereof the following mechanism is employed. Two arms M converging toward their upper ends are fulcrumed at their lower ends each to a spoke of the wheel—these fulcrums being marked  $m$ . At their upper ends they are pinned as at  $m'$  the one to the lug  $r^2$  on one end of the ring, the other to the lug  $r^3$  on the other end of the ring. It will be seen that if the two arms be drawn together, they will draw together the two ends of the ring. At the same time the arrangement of the centers  $m, m'$  of each arm is such that when the arms move toward each other the tendency is not only to draw the free

ends of the ring together, but also to draw them slightly inward toward the center of the wheel, this inward movement being just sufficient for the reduction in diameter occasioned by the movement of the ends toward each other. To impart this movement to the arms I make use of a sliding head N having on its inner face next to the arms two cams or inclines  $n$ , which overhang and contact with pins  $m^2$ , one on each arm M—these cams or inclines being located so as to stand on exterior opposite sides of the two pins. If the head N be drawn toward the center of the wheel, its cams or inclines  $n$  will by their action on pins  $m^2$  draw together the arms M. The movement of the head is obtained by mounting it on or making it part of a stem having an upper squared portion  $N'$  which fits between guides  $n'$  on the wheel, and a lower cylindrical and screw threaded tang  $N^2$ , which is engaged by a nut O formed externally as a worm gear, to engage a worm P. This worm is mounted on the end of the operating spindle L which for this purpose is prolonged beyond its pinion K. The worm gear O is supported and suitably held in a bearing O' on the wheel. Rotation of the operating spindle in a direction to permit the pushers to recede will draw the head N down or inward, thus drawing together the arms M, and consequently contracting the ring—the gearing and other parts being so proportioned that this movement on the part of the arms shall be commensurate with that of the pushers. When the pushers on the other hand advance the head N moves outwardly thus lifting the cams  $n$  and permitting the outward movement of the arms M due to the expansion of the ring by the pushers.

My improved wheel can be applied to and used with either one of the styles or types of cards referred to at the outset of this specification. The adjustment is effected easily and expeditiously from one central point. No parts of the wheel require to be removed when the card is reclothed, and the results obtained so far as adjustment is concerned are more nearly theoretically perfect and accurate than has heretofore been possible.

Having described my improvements, what I claim, and desire to secure by Letters Patent, is as follows:

1. In a flat supporting wheel or circle, the combination with a flat supporting ring capable of contracting and expanding in diameter, of a rotatable annular internal gear seated in the wheel, an annular adjusting block mounted on the internal gear but held against rotary movement therewith, and internally screw threaded to engage a corresponding external thread on the internal gear, and pushers bearing at their outer ends against the ring, and at their inner ends against the exterior of the adjusting block, substantially as and for the purposes hereinbefore set forth.

2. In a flat supporting wheel or circle, the combination with the flat supporting ring ca-

pable of contracting and expanding in diameter, of a rotatable annular internal gear seated in the wheel, an annular adjusting block mounted on the internal gear but held  
5 against rotary movement therewith, and internally screw threaded to engage a corresponding external thread on the internal gear, and pushers bearing at their outer ends against the ring, and at their inner ends  
10 against the exterior of the adjusting block, and means for contracting the ring at the time the pushers are retracted, substantially as and for the purposes hereinbefore set forth.  
3. The combination of the flat supporting  
15 ring capable of contracting and expanding in diameter, pushers bearing outwardly against

the ring, mechanism whereby said pushers are operated to move simultaneously and together, the arms M, M, jointed at their outer ends to the respective sections of the ring, 20 and at their opposite ends to the body of the wheel; and means connected to and operated by the pusher actuating mechanism for drawing together the arms at the time the pushers are retracted, substantially as and for the purposes hereinbefore set forth. 25

In testimony whereof I affix my signature in presence of two witnesses.

JAMES C. POTTER.

Witnesses:

EDWARD W. BLODGETT,  
DANIEL T. BROWN.