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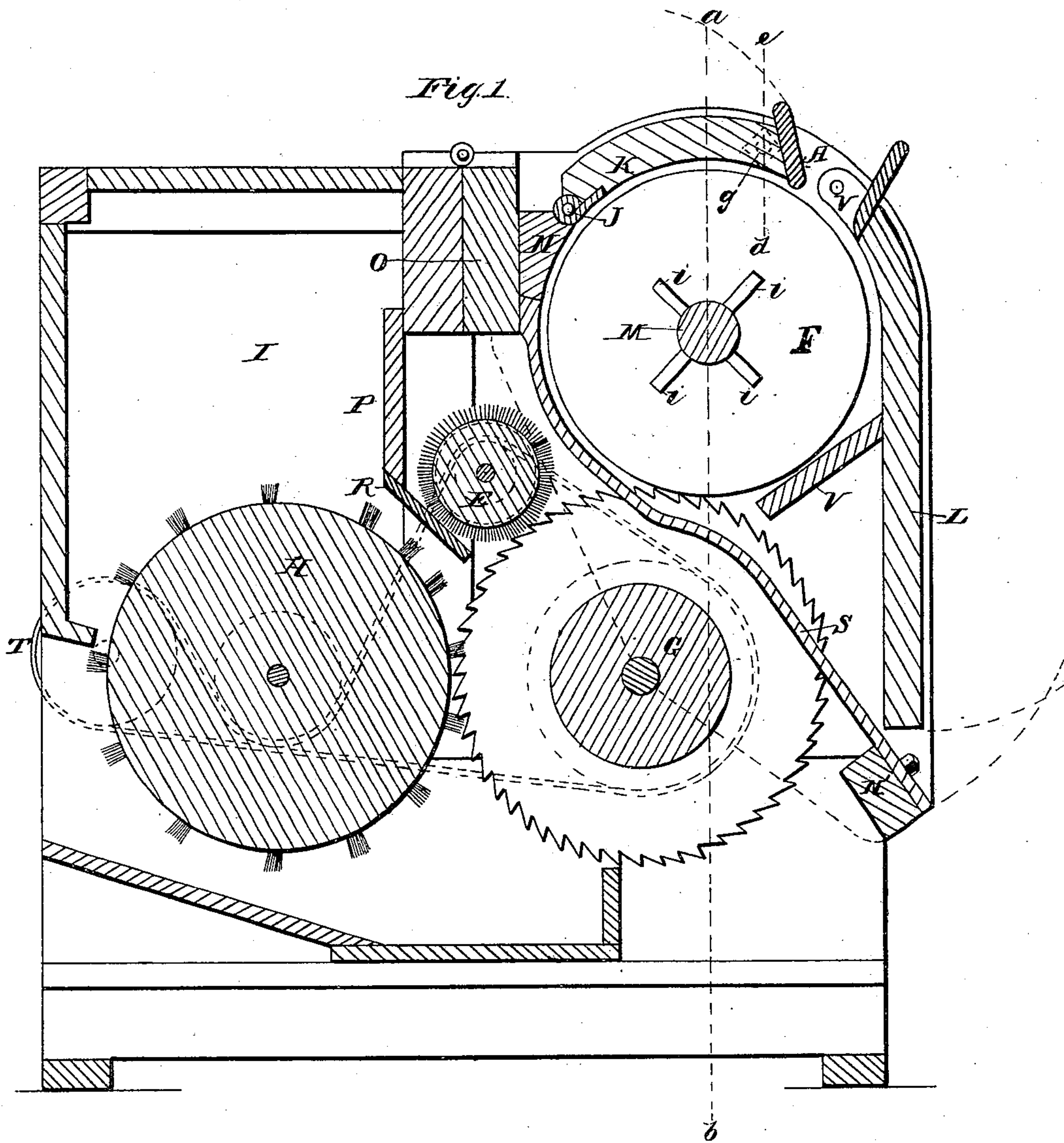
3 Sheets—Sheet 1.

R. D. KINNEY.

COTTON GINNING MACHINERY.

No. 246,276.

Patented Aug. 23, 1881.



Witnesses  
John W. Leaver,  
Joel E. Chambliss

Inventor  
R. D. Kinney

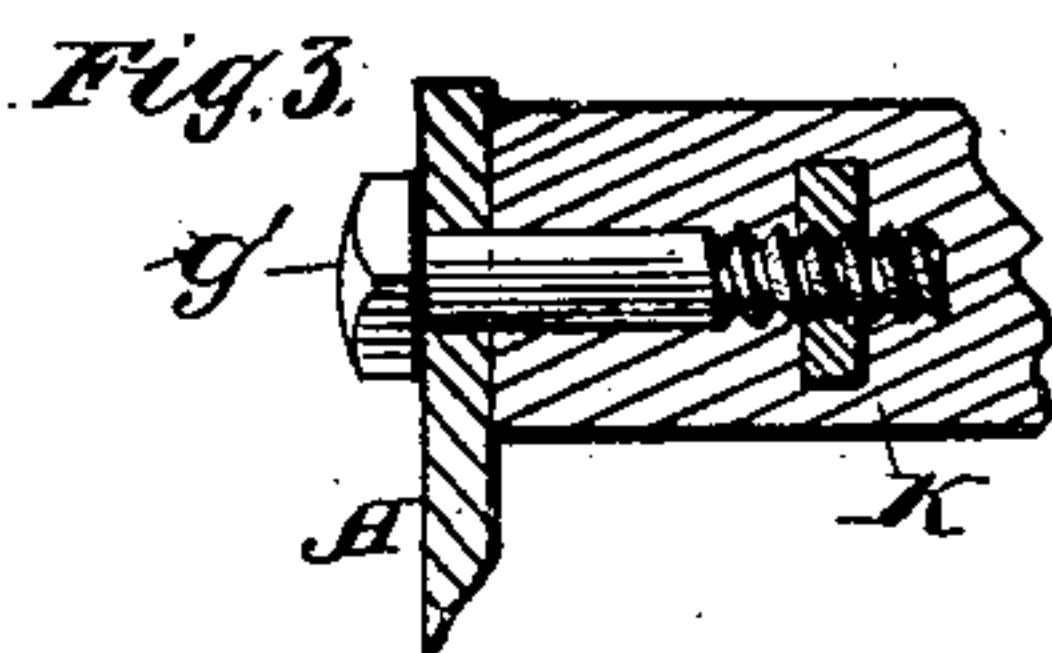
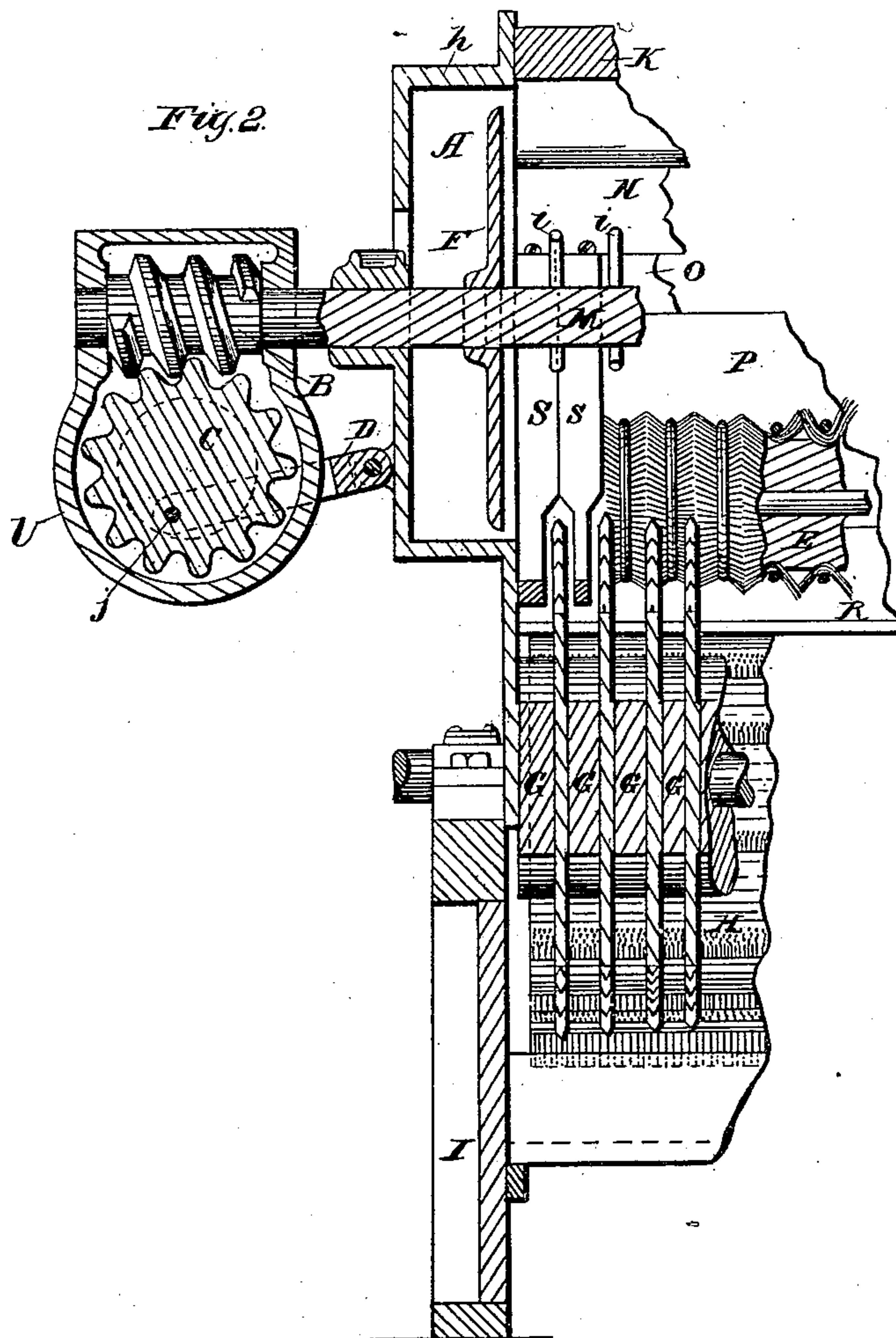
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*Witnesses.*

*John D. Carver,*  
*Joel E. Chamberlin*

*Inventor.*

*Robt. Kinney*

(No Model.)

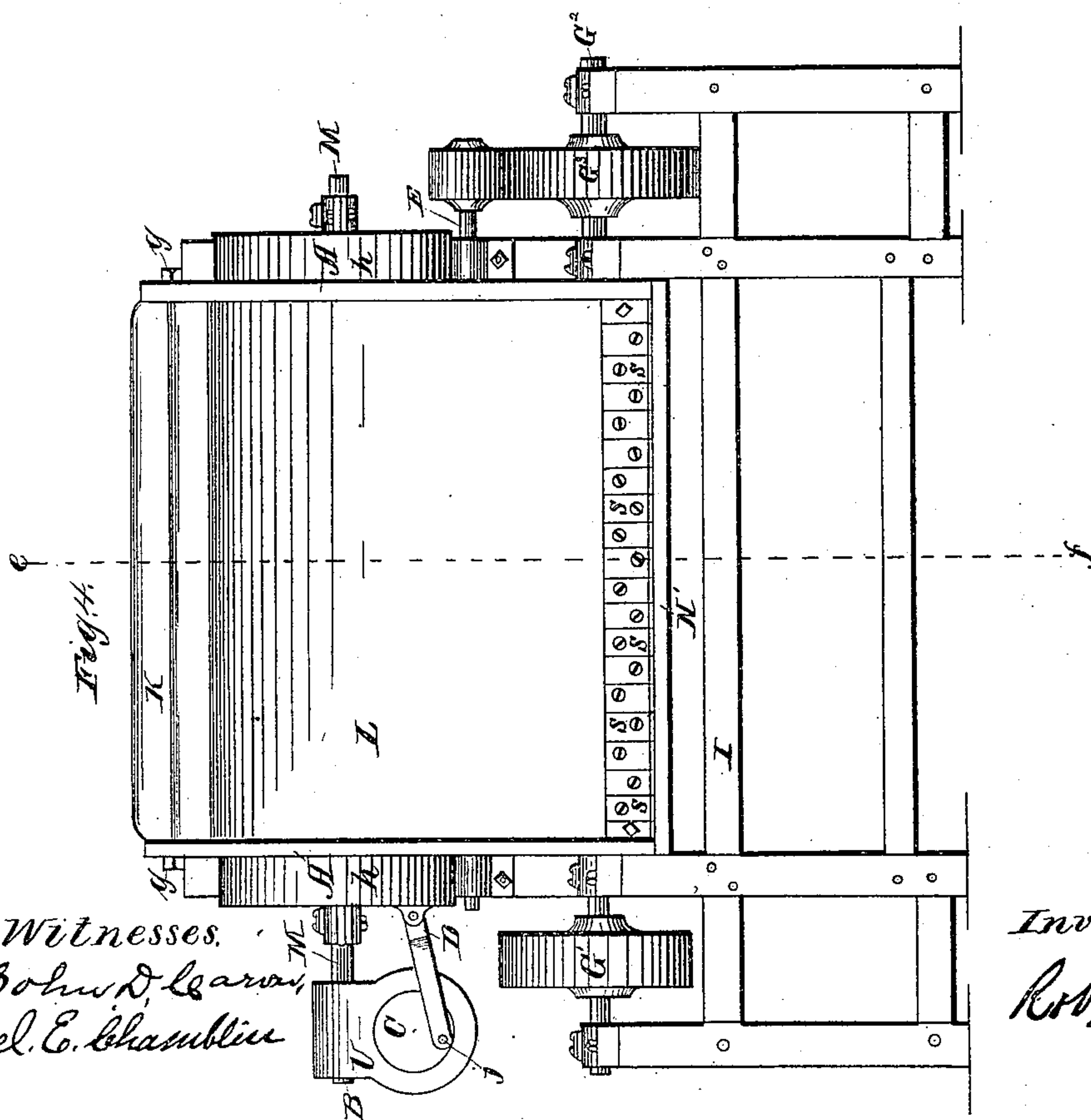
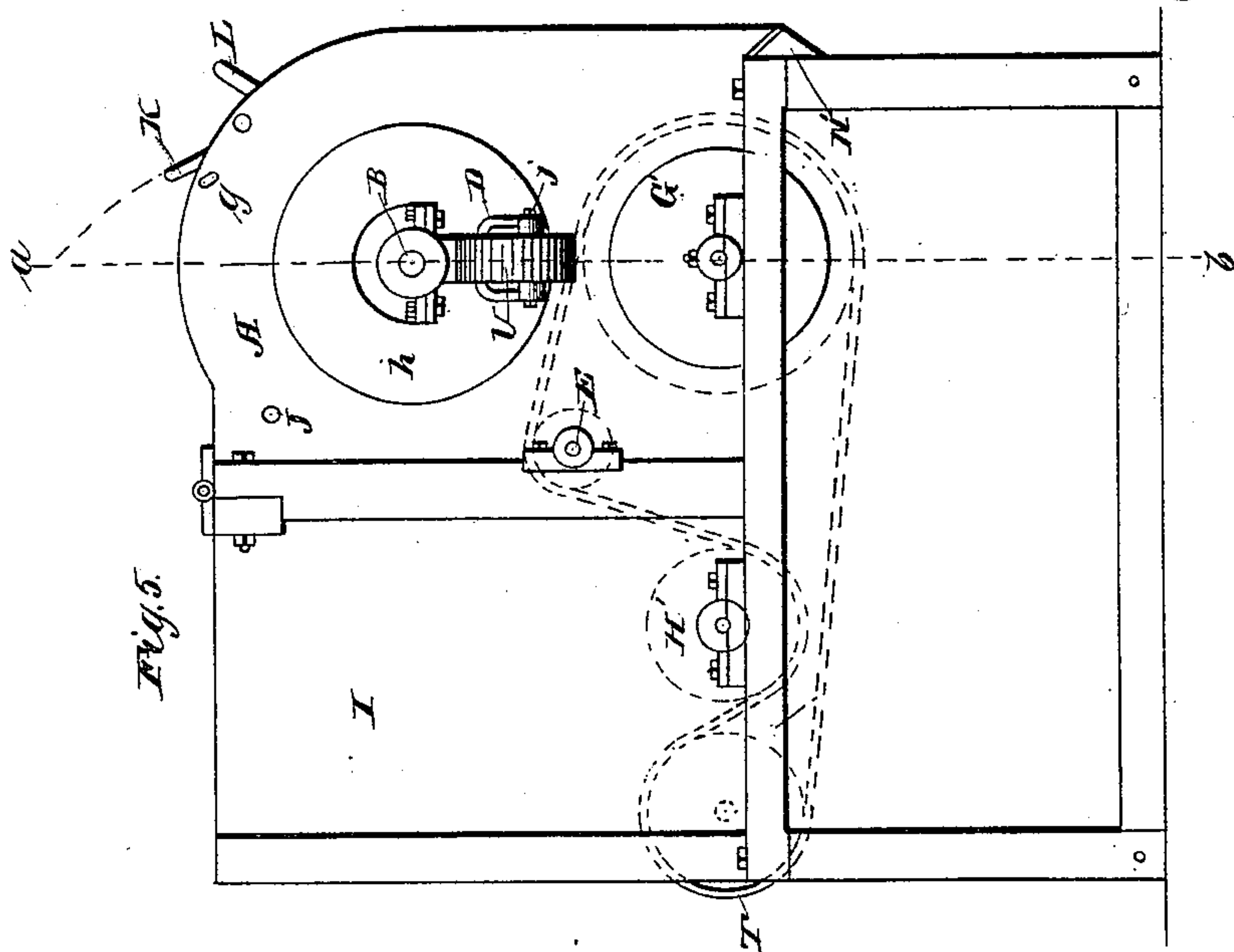
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Witnesses.

John D. Leary,  
Joel E. Chamberlin

Inventor.

R. D. Kinney



# UNITED STATES PATENT OFFICE.

ROBERT D. KINNEY, OF MACON, GEORGIA.

## COTTON-GINNING MACHINERY.

SPECIFICATION forming part of Letters Patent No. 246,276, dated August 23, 1881.

Application filed February 21, 1881. (No model.)

*To all whom it may concern:*

Be it known that I, ROBT. D. KINNEY, a citizen of the United States, residing at Macon, in the county of Bibb and State of Georgia, have invented a new and useful Improvement in Cotton-Ginning Machinery, of which the following is a specification.

My invention relates to improvements in that class of machinery used for obtaining the lint or fiber from seed-cotton; and it consists in the application of mechanism by which the cotton-roll within the roll-box is made to revolve with a longitudinal reciprocating motion for the purpose of increasing the efficiency of the gin.

In the present operation of the cotton-gin the contact of the saws with the roll is continually in the same path or plane of revolution, so that the saws form by their constant action over the same course a groove, which becomes filled more or less with cleaned seed. These seeds, lying in the course of the saws' action, impair their efficiency by preventing other seed-cotton coming freely in contact with the teeth.

The object of my invention is to obviate this impediment, which I accomplish by changing the course of the saws' contact with the roll by imparting to the roll a longitudinal reciprocating movement in combination with its present rotary motion. To do this I make use of the device known in mechanics as the "worm" or "screw" gear. This device is connected to the end of a shaft, serving as the axis of the cotton-roll, by bearings allowing no movement lengthwise on its journals at those bearings, which move with the reciprocating motion of the shaft. The screw of the worm-gear placed on the end of the shaft revolves with it and actuates the gear. The gear has connected to it, eccentric to its axis, the end of a link, the other of which is fastened to the roll-box head or other suitable fixed connection. This shaft, forming the axis of the cotton-roll, revolves on journals having bearings at each end of the roll-box or cotton-hopper. The part of the shaft forming the core of the roll has disks at each end of the roll, forming ends therefor. Between those disks the shaft is adapted so as to take hold of the cotton-roll, so that both will rotate together. As the shaft

revolves with and carries the cotton-roll the resulting movement of the screw-gear, in combination with the link, causes the shaft, and with it the cotton-roll, to revolve with a longitudinal reciprocating motion. The bearings connecting the screw-gear to the shaft are formed so as to serve as a casing, also for the purpose of excluding the dirt from the device.

Instead of the disks fastened on the shaft, suitable plates or disks can be attached to the ends of cotton-box, and held in position by springs, to accommodate the reciprocating motion of the cotton-roll. I prefer the use of the disks fastened on the shaft, as hereinafter more fully set forth. I am aware that revolving heads for the ends of the cotton-roll are in use, but shall include in my claims their application for this purpose in combination with the reciprocating shaft carrying them. Other means than those described can be employed to produce this reciprocating motion of the cotton-roll—for instance, a screw having a right-and-left-handed thread carried by the shaft above described, in combination with a pivoted fork the prongs of which are adapted to follow the thread in a manner similar to the devices used on some forms of printing-presses for distributing the ink; or the worm and gear above described can be applied so that the screw's journals would serve as a journal for the reciprocating shaft which passes through the hub of the screw, and free to move endwise, but prevented from revolving within the hub of the screw by a groove and feather or spline. The link then being fastened to the end of the shaft, the same result can be accomplished by causing the saw-shaft and ribs to reciprocate parallel with the axis of the cotton-roll; or the entire cotton-box, exclusive of the ribs and saws, can be made to reciprocate parallel with the saw-shaft.

Other devices will occur to the mind of an ingenious person to accomplish what is the essence of my invention, consisting in adapting the course of the saws' action on the cotton-roll in a helical, curved, or irregular line around the periphery of the cotton-roll; but I prefer the use or application of the apparatus above described, and hereinafter more fully set forth.

I am aware that devices are applied within the roll-box or hopper which it is claimed pre-



sent a new surface of seed-cotton to the saws, but, if effected at all, is only partially so, as the principle of the operation consists in distorting or cramping the cotton-roll, and relies upon its expanding again, which tends rather to break the roll without obviating the impediment caused by the cleaned seed, as above explained.

My invention further consists of improvements on the roll-box or cotton-hopper, by which the delay and annoyance incident to the breaking of cotton-rolls while in operation are avoided.

The present means employed when the cotton-roll breaks, or is not hard or dense as desired, is to fill in the box by fastening a strip of wood or other suitable material on the top side of the box, so as to cause a pressure on the roll at this point.

My invention is to hinge the top side of the roll-box, locating the hinge-joint back of a vertical plane passing through the axis of the cotton-roll, and extend the movable edge to a point in or on the outside of said vertical plane, and adapted to admit of adjustment toward or from the center or axis of the cotton-roll, according to the degree of pressure desired, and is held in position by bolts or other suitable fastening at the ends, and at intermediate points if required, on account of the flexible nature of the material employed.

I am aware that adjustable devices for creating pressures against the cotton-roll are employed within the roll-box back of a line or plane vertically through the axis of the cotton-roll, and will include in my claims the invention of an adjustable pressure-board forming one of the sides of the roll-box, and having its point of greatest pressure directly in or outward from the vertical plane through the axis of the cotton-roll, as hereinafter more fully set forth.

My improvement further consists of the combination of a rotating motor or whipping-brush rotating on an axial line parallel with the saw-shaft, and between the cotton-roll and stripping-off brush, in contact with the teeth of the saws, for the purpose of whipping, brushing, or combing the lint while yet on the teeth of the saws, thereby freeing it from motes, sand, and other impurities impairing the sample of the staple. It consists of a revolving brush made of bristles or other suitable material, similar to the stripping-off brush in present practice, and receives its motion from the belt driving the stripping brush, rotating, however, in a contrary direction to that given to the stripping-brush.

In order to enable others skilled in the art to which my invention appertains to make and use the same, I will now proceed to describe its construction and operation, reference being made to the accompanying drawings, in which similar letters refer to similar parts.

Figure 1 is an enlarged transverse vertical section of Fig. 4 at dotted line *e f*. Fig. 2

is an enlarged partial longitudinal vertical section at line *a b* of Fig. 5. Fig. 3 is a vertical section at dotted line *c d* of Fig. 1. Fig. 4 is a front elevation of a cotton-gin, showing my improvements attached. Fig. 5 is an end view of Fig. 4.

I represents the frame of a cotton-gin. *G* are the saws; *G*<sup>2</sup>, the saw-shaft, and *G*<sup>1</sup> the main driving-pulley. *H* is the stripping-brush; *H*<sup>1</sup>, the brush-shaft pulley; *N*<sup>1</sup>, the lower, and *O* the upper, breast-board, to which the ribs *S* and roll-box ends *A* are fastened. The roll-box is fastened to the frame in the usual way. *L* is the front of the roll-box; *V*, the seed-board, which can be made straight, as shown in section, Fig. 1, or curved to correspond to the periphery of the cotton-roll, as may be desired. It is well, however, to keep in mind the object to make the inside of the roll-box as round and free from irregularities as practicable, excepting those deviations from a cylindrical outline specially provided. *N* is a filling-in piece, of any suitable proportions, to make a finish between the ribs and press-board *K*. *P* is the division-board, and *T* the belt-tightener. These parts may be made in any of the usual and known ways.

*M* is the reciprocating shaft forming the axis of the cotton-roll, and is actuated by the cotton-roll, means being provided for preventing the roll turning on the shaft, as shown in Fig. 1, in which *i i* are projections for this purpose, in combination with the disks or revolving heads *F*, which, in combination with link *D*, produce the reciprocation motion of the shaft *M*.

*U* is a casing forming the bearings for the journals of the screw *B* and gear *C*, and also a covering to protect the device from dust and dirt. This casing or bearing is fastened on the end of shaft *M*, as shown, and moves back and forth with the longitudinal reciprocating motion of this shaft, accordingly as the pin or fastening *j* connecting the link *D* to the gear is actuated from one side of the gear's axis of revolution to the other. The extent and rapidity of this reciprocating movement is proportional to the diameter and pitch of the gear *C*.

The heads or ends *A* of the cotton-box are recessed sufficient to admit the ends of the cotton-roll to revolve with a longitudinal reciprocating motion on its axial line within said recess, as shown in Fig. 1, in which *F* is the disk or revolving head of the cotton-roll, and *h* the wall of the recess. The disks *F* are located on the shaft so that when the shaft is at one end of its longitudinal movement the disk will be flush with the inside of the heads *A*, while the disk on the opposite end will be back in the recess the extent of its lateral travel. One of the ends *A* supports a lug or means of fastening for the link *D*, as shown in Figs. 2 and 4. Both heads have holes *J* and *g* for fastening the adjustable press-board *K*, hereinafter more fully described. The hole *g* is oblong, of which the major axis is a chord of an arc having its radial line through the center of hole



J. The oblong hole *g* is located above a horizontal plane passing through the axis of the cotton-roll, and in, or outside, toward the front of the gin from a vertical plane passing through the axis of the cotton-roll. Fig. 3 shows a detail section through the hole *g*, A being the roll-box end, K the adjustable press-board, and *g'* a joint-bolt, applied as shown, for holding the board K in position when adjusted.

The journals of the shaft M are long enough to allow the endwise movement, and of parallel diameter. The link D has two arms for fastening to the gear, as shown.

The cotton-hopper or roll-box is formed by the heads or ends A, the top or adjustable pressure-board K, the front L, seed-board V, ribs S S, and filling-in piece N. The heads or ends A are fastened to the breast-boards O and N' and set up against the end ribs, as shown, being bolted to the breast-boards through lugs or flanges, as in the usual way. Bearings for the shaft M are bolted or cast on and recess for the disks F provided, as hereinbefore set forth. These heads A can be made to fit over the saw-shaft, as shown in dotted line in Fig. 1.

The adjustable pressure-board K, forming the top of the box, is made concave on the inside, to correspond to the circumference of the cotton-roll, and connected to the hopper by hinges and bolts, as shown, or other fastenings adapted to admit of adjustment toward or from the axis of the cotton-roll, so that pressure is effected on the roll at a point in or forward of a vertical plane passing through its axis, as shown.

The rotating moter or brush E is made solid on account of its small diameter and high rate of revolution, requiring rigidity. The bristles are fastened on it in any of the known and usual ways practiced in fastening bristles on the stripping-brush. Suitable bearings or boxes for its journals are fastened to the frame of the gin, as shown at E in Fig. 5. Motion is communicated to it from the brush-belt, as shown by dotted lines in Figs. 1 and 5, in which H is the stripping-brush pulley, G<sup>3</sup> the brush-driver on end of saw-shaft, and E this moter pulley, and T the tightener.

Care must be observed to connect the belt so that the moter E is made to revolve in the same direction as the saw-shaft and in contact with the saws, so that the bristles extend against and below the roots of the teeth.

The guide or division board R is placed on an incline, as shown in Fig. 1, to deflect the motes and sand down between the saws under the gin.

Having thus fully described my invention and the construction of its parts, I now proceed to explain its mode of operation substantially as follow:

Seed-cotton, being fed into the cotton-hopper, forms in a roll around the shaft M between the disks F, and is acted on by the saws G, causing it to revolve, and with it the shaft M, act-

uating the gear G through the screw B, causing the shaft M to move with a longitudinal reciprocating motion, and with it the cotton-roll, thereby changing the position of the surface of the latter in its contact with the saws. The lint carried away by the teeth of the saws is brushed or beaten by the brush E before it reaches the stripping-brush, from whence it passes into the condenser or lint-room, as the case may be.

Having thus fully described my invention, what I claim as new, and desire to secure by Letters Patent, is—

1. The combination of saws G and brush H with a longitudinal reciprocating cotton-roll revolving in contact with said saws G, substantially as set forth.

2. The combination of saws G, brush H, and brush E with a longitudinal reciprocating cotton-roll revolving in contact with the periphery of said saws G, substantially as set forth.

3. The combination of saws G, brush H, and adjustable pressure-board K with a longitudinal reciprocating cotton-roll revolving in contact with said saws G, substantially as set forth.

4. An improved cotton-hopper or roll-box on cotton-gins, having ends A adapted for the movement of a horizontal longitudinal reciprocating shaft, M, with disks F, projections *i i*, in combination with or without pressure-board K, substantially as and for the purpose specified.

5. The combination of link D, gear C, screw B, shaft M, revolving disks F, projections *i i*, in the manner and for the purpose substantially as set forth.

6. The combination of link D, gear C, screw B, shaft M, revolving disks F, projections *i i* with saws G and brush H, substantially as shown and described.

7. The combination of the heads A, having recess *h* to receive disks F, shaft M, disk F, screw B, casing U, gear C, link D with saws G and brush H, substantially as shown and described.

8. The combination of an adjustable pressure-board, K, heads A, having holes J and *g*, with saws G and brush H, substantially as described.

9. The combination of the rotating brush E and division or partition R with saws G and brush H, substantially as set forth.

10. The combination of an adjustable pressure-board, K, heads A, having recess *h*, and holes J and *g*, shaft M, disks F, screw B, gear C, casing U, and link D with the saws G and brush H, substantially as set forth.

In testimony that I claim the foregoing I have hereunto set my hand.

ROBT. D. KINNEY.

Witnesses:

JOEL E. CHAMBLISS,  
HENRY THARPE.