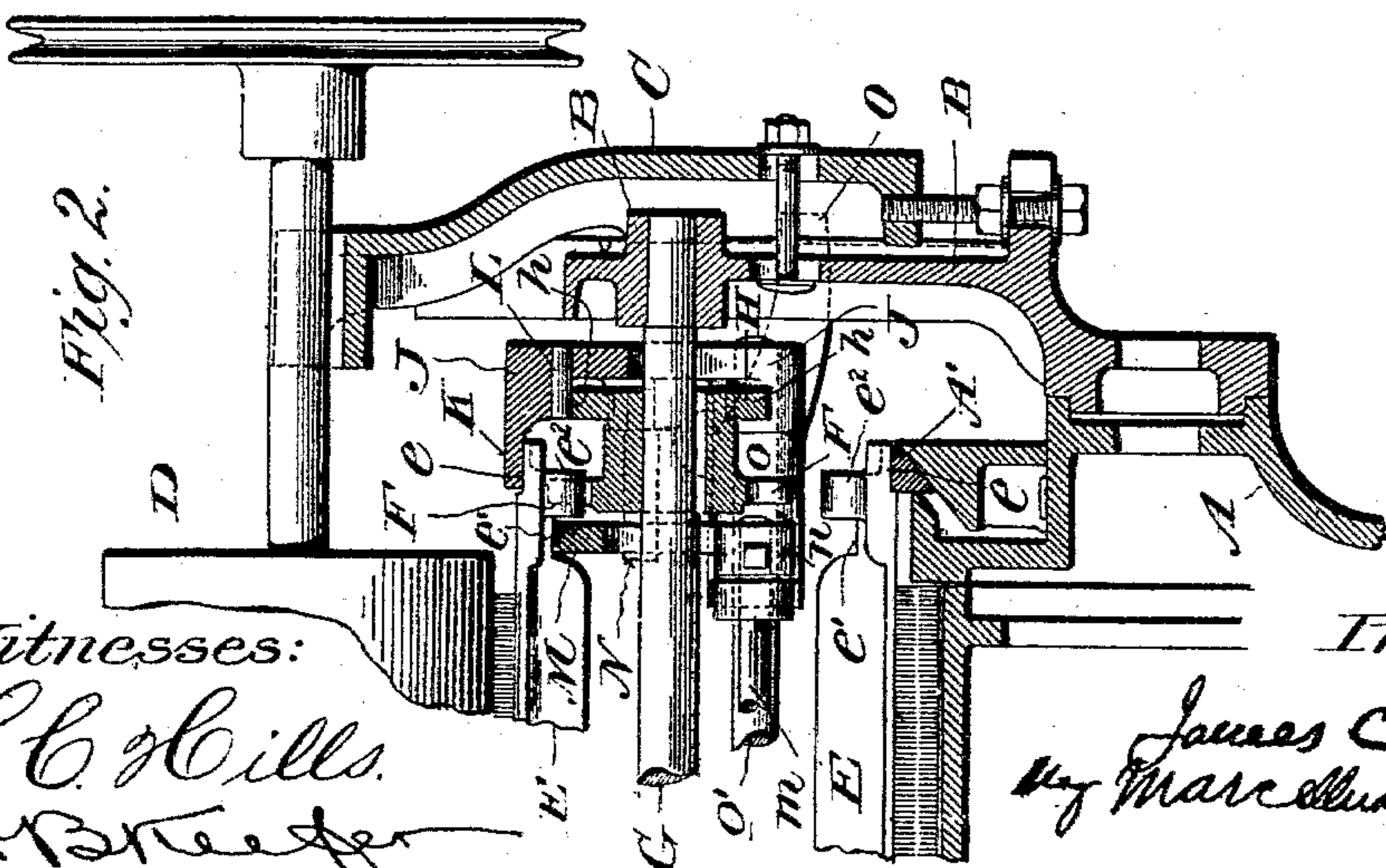
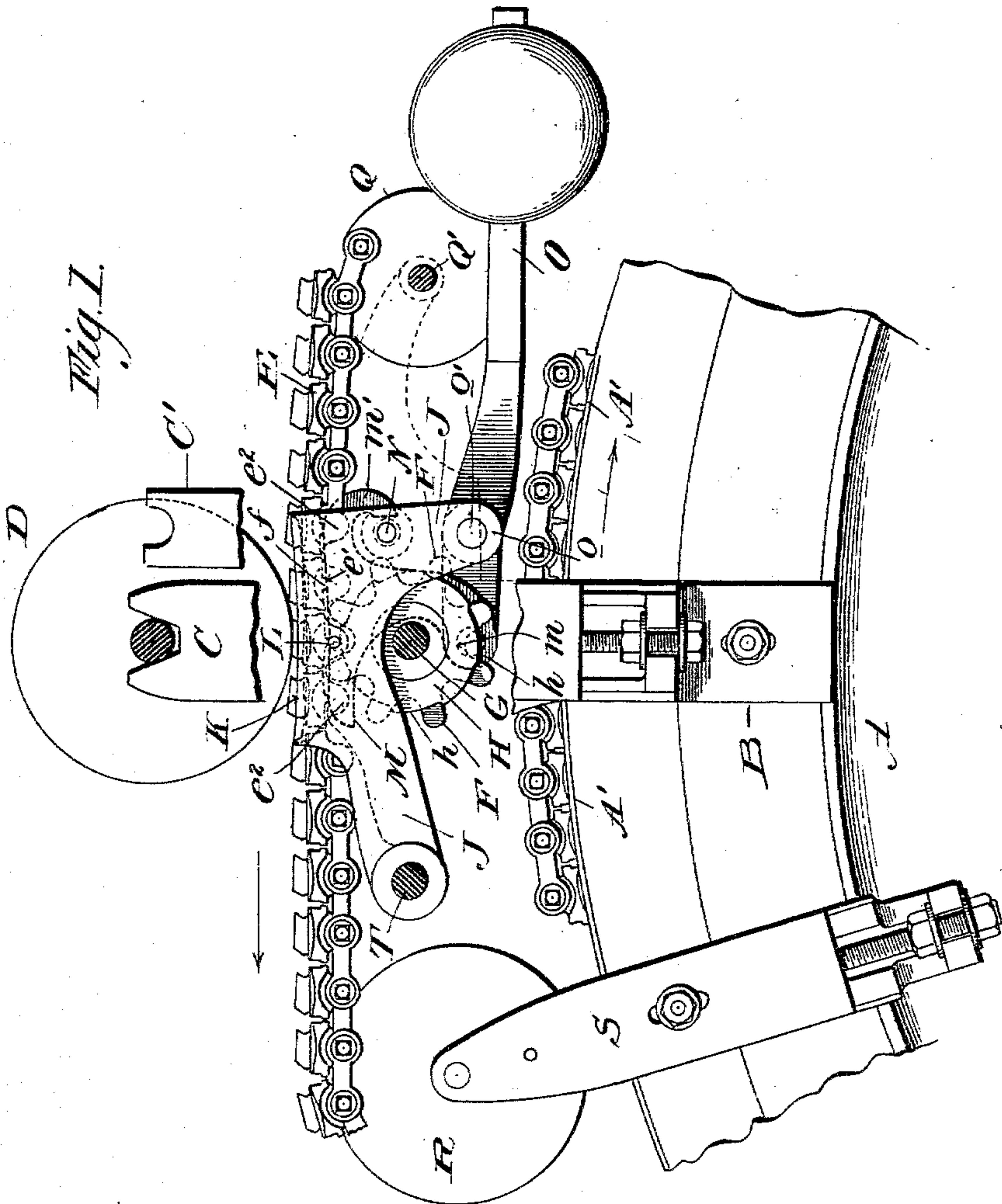


J. C. POTTER.

MECHANISM FOR GRINDING FLATS IN CARDING ENGINES.

No. 559,601.

Patented May 5, 1896.



Witnesses:

L. C. Hills.
J. B. Keefe

Inventor:

James C. Potter
By Marcellus Bailey
his Atty.

(No Model.)

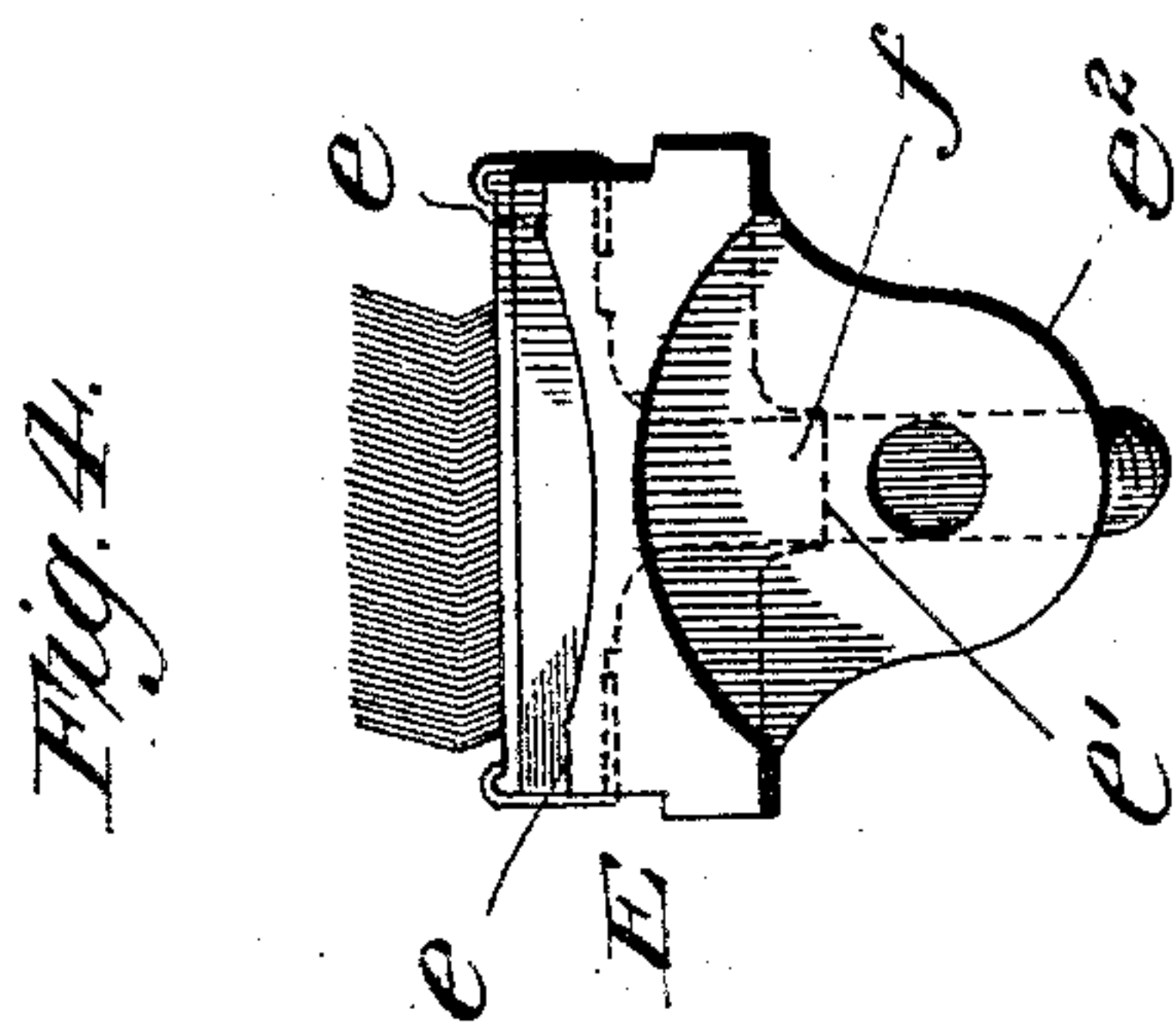
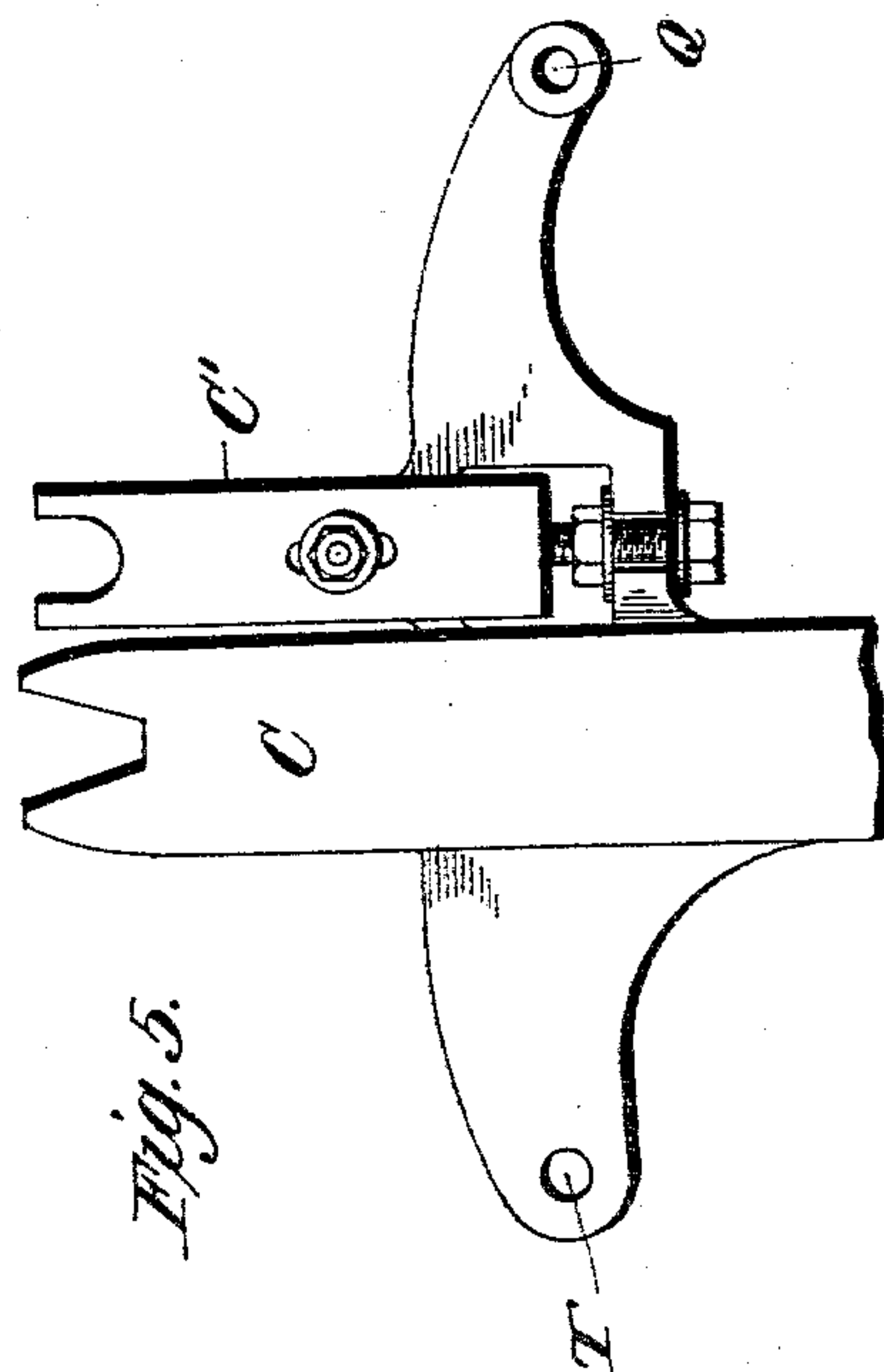
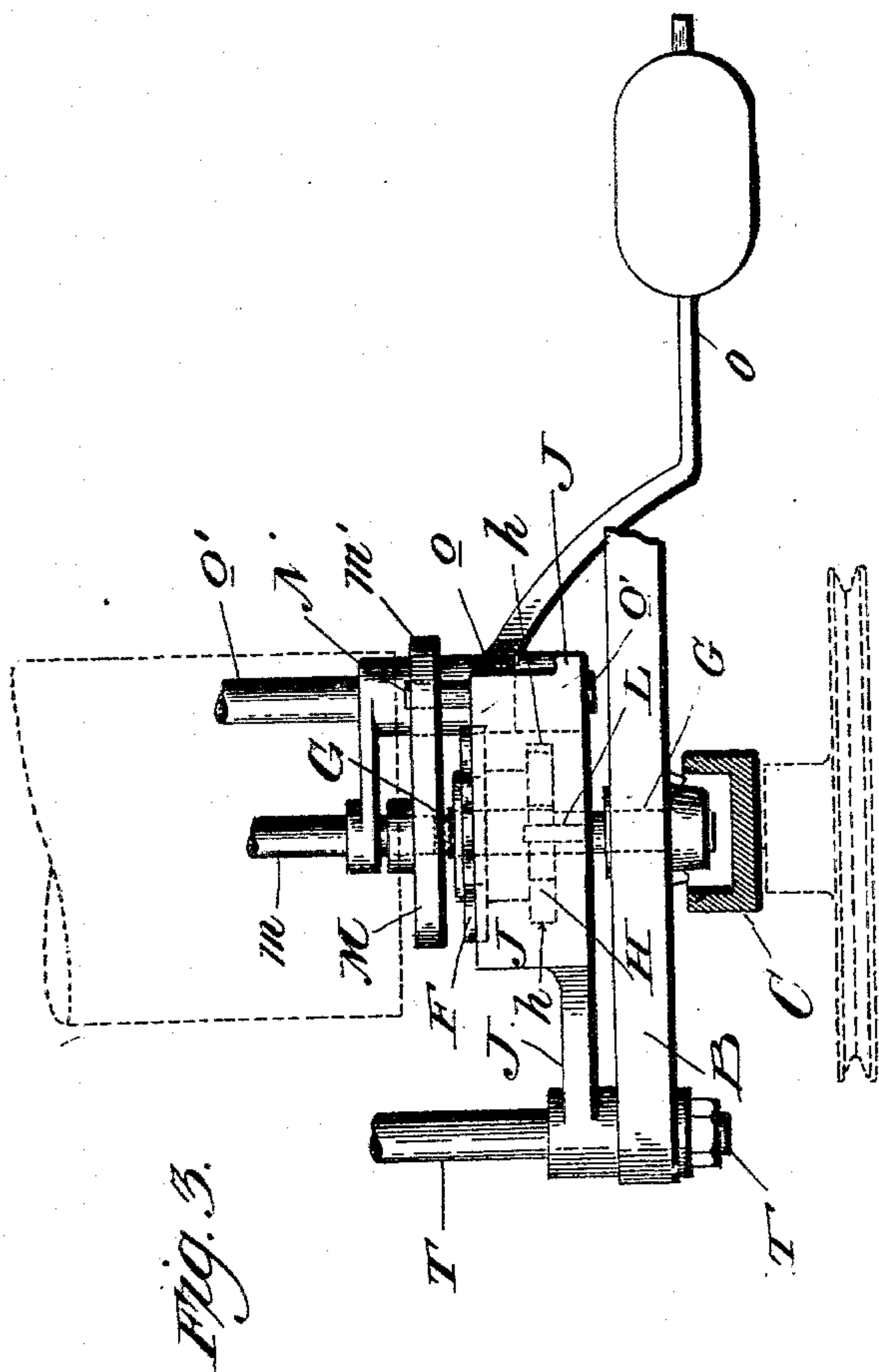
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UNITED STATES PATENT OFFICE.

JAMES C. POTTER, OF PAWTUCKET, RHODE ISLAND.

MECHANISM FOR GRINDING FLATS IN CARDING-ENGINES.

SPECIFICATION forming part of Letters Patent No. 559,601, dated May 5, 1896.

Application filed February 18, 1896. Serial No. 579,767. (No model.)

To all whom it may concern:

Be it known that I, JAMES C. POTTER, of Pawtucket, in the State of Rhode Island, have invented certain new and useful Improvements in Mechanism for Grinding Flats in Carding-Engines, of which the following is a specification.

In the operation of grinding card-flats it has been the custom either to support the flats upon a guide or bearing which enters that one of the two seatings with which the flats are provided at each end known as the "grinding-seating" or to press them up against the under face of a guide, (the bearing-face of which may be patterned to impart the desired surface to the flats,) and in this case the "working seating" of the flats—or the seating which travels over the "bend" when the flats are doing their work—is that which is pressed against the guide. Both of these plans are open to objection in that they do not effectively take into consideration and provide against the differences in grinding brought about by the wear of the working seatings due to their frictional contact with the bend over which they travel when doing their work in the carding-engine.

It is the object of my invention to obviate this objection and to provide a mechanism by which the flats will be ground with the utmost accuracy and uniformity. To this end I press, as heretofore has been done in one of the known plans above alluded to, the workingseating of the flat up against a guide; but the guide in my mechanism instead of being stationary is freely movable vertically or in a direction toward and away from the grinding-roll, and it has a bearing of the same curvature as the bend, so that the flat in traveling along the guide follows for that distance a path which is the counterpart of that in which it travels over the bend. With this movable guide I combine an actuating pattern cam or former, by which the guide is actuated and controlled in its movements in such manner that as the flat traverses the guide the latter will be moved so as to impart to the toothed face of the flat a surface of the desired conformation. It is this combination of the guide freely movable to and from the grinding-roll with an actuating pat-

tern cam or former therefor which mainly characterizes my invention.

To enable those skilled in the art to understand and use my invention, I will now proceed to describe it more in detail by reference to the accompanying drawings, after which I will point out in the claims those features of the mechanism or apparatus which I believe to be new and of my own invention.

In the drawings, Figure 1 is a side elevation of so much of a revolving-flat carding-engine as needed for the purpose of explanation with a portion of the grinding bracket and stand removed, so as to expose the parts behind. Fig. 2 is a section on line 2 2, Fig. 1. Fig. 3 is a plan view with the flats removed. Fig. 4 is an enlarged end view of a flat. Fig. 5 is an elevation of that part of the grinding stand and bracket which is removed in Fig. 1.

I represent the mechanism on one side of the engine. The other side of course is provided with a similar mechanism.

A is a portion of the frame of the carding-machine, and A' is the usual bend on which the flats E rest and over which they move in doing their work. Each flat at each end has a working seating *e* and a grinding-seating *e'*.

B is the grinding-bracket stand, secured to the frame A and supporting the adjustable grinding-bracket C, in which rests the grinding-roll D. The grinding-stand also carries the adjustable bracket C' for the burnishing-roll. The flats as they pass toward and away from the grinding-roll are supported upon pulleys Q and R. The first-named of these revolves upon a fixed cross-shaft Q', which extends between and connects the two grinding-stands on opposite sides of the engine and acts as a stay-rod. The block or pulley R is mounted in and carried by a bracket S, adjustably secured to the frame of the engine.

J is the guide-piece, which, as hereinbefore stated, should be freely movable to and from the grinding-roll, to which end it is in the present instance fulcrumed upon the shaft T, which, like shaft Q', extends between and connects the two grinding-stands B on opposite sides of the engine and acts as a stay-rod. This piece J has the part K, which overhangs the ends of the flats to be ground and

up against which the working seatings e of the flats are pressed and held, as hereinafter described. This part K, which constitutes the guide proper, has a bearing-face of absolutely the same curvature and radius as that of the bend A' , upon which the working seatings bear when the flats are carding.

The movements of the guide to and from the guiding-roll are controlled by a pattern cam or former whereby, as each flat is ground from heel to toe, the gradual lift of the guide and consequent rise of the flat, needed in order to accurately grind the slanting face of the flat, is obtained. This former or pattern-cam consists, in the present instance, of a cam-wheel H, formed with a number of cams h and keyed or otherwise suitably fixed on a cross-shaft G, mounted to revolve in bearings in some suitable part of the machine, in this instance in the grinding-stands B. This shaft is rotated in such manner that it will revolve a distance equal to one cam h during the time that any one flat is passing beneath the grinding-roll. To effect this result I fix on the shaft at each end a cog or star wheel F, having teeth equal in number to the cams or cam-lifts h and so fashioned and located that these teeth will engage, in rack-and-pinion fashion, the lugs or bosses e^2 on the flats. In this way the cam-shaft G is revolved by and moves in perfect unison with the flats. At the point where the cams h meet the guide-piece J the latter is provided with a steel bearing-pin L to resist wear and reduce friction. It is necessary that during the movement of the guide occasioned by the action of the cams the flats should be held up against the guide proper, K, and to this end I provide a presser which is mounted on and carried by the guide-piece J. The pressing device in the present instance consists of a weighted lever O, fulcrumed between its ends at o on a cross-rod o' , which extends between and connects the guide-pieces J on opposite sides of the engine. In the end of the shorter arm of the lever is fulcrumed the presser M, which is fast upon a cross-shaft m , taking its bearing in the two levers O on opposite sides of the machine and carrying a presser M at each end. The presser is formed and positioned so as to enter the grinding-seating e' of the successive flats, and the action of the lever O is to squeeze or press the flats between the guide K and the presser M whatever may be the movement of the guide-piece J. To prevent the presser M from following the movement of the flats it has a hook-shaped end m' , which catches over a retaining-pin N, projecting from the inner face of the guide-piece J.

Such being the construction and organization of the parts the mode of operation is as follows: The pulleys R, one on each side of the machine, are lowered until the weight of the flats comes on the guide-pieces J sufficiently to cause the latter to bear with the requisite pressure upon their cams h . Now

as the flats move along they, by the engagement of the lugs e^2 with the star-wheels F, revolve the cam-shaft G, and consequently the pattern cam or former H. As each flat passes beneath the grinding-roll the cam h appropriate to it will gradually lift the guide-piece J, and consequently the flat. The shape of the cam is such that the conjoint forward movement of the flat and the lifting motion of the cam will combine to retain the grinding-point or point at which the grinding-roll meets the wire face of the flat always in the same plane notwithstanding the slant of that face from heel to toe. At the time the flat passes beyond the grinding-roll the cam h appropriate to that flat passes beyond the bearing-pin L, and the guide-piece J at once drops upon the succeeding cam h into position for the commencement of the grinding upon the following flat. After the grinding operation has been completed the working parts are relieved from strain and wear by raising the pulleys R so as to take off from said parts the weight of the flats and then lifting the lever O on each side of the machine. The first effect of lifting the lever is to lower the presser M and thus remove the pressure from below upon the flats. By this time the lever will have brought up against the pin N or some other suitable stop on the guide-piece J, and consequently further lift of the lever O will have the effect of raising it and the guide-piece J bodily upon the axis T as a fulcrum. In this way the guide proper, K, will be lifted out of contact with the flats and the guide-piece J raised out of contact with the pattern cam or former H, and thus there will be no pressure of the working parts upon either the flats or the cams. The movement of the lever O is stopped before it is raised high enough to bring the presser M into contact with the flats, the ends of the latter passing freely about midway through the space or clearance now existing between the presser and the guide, and the lever, by any suitable latch or detent, is sustained in this position until the parts are again to be called into operation. I prefer that the presser M shall bear, not against the face of the grinding-seating e from end to end, but against a central rib f thereon, arranged so that it shall be in a line which, if prolonged, would pass midway between the two ends of the working seating, which, as usual, is hollowed out between these points. In this way the flat is enabled to adapt itself more surely and accurately to the face of the guide proper, K.

Having described my improvements and the best way now known to me of carrying the same into effect, I state in conclusion that I do not confine myself to the structural details herein described, for manifestly the same can, in many respects, be widely varied by the skilled mechanic without departure from the spirit of the invention; but

What I claim herein as new, and desire to secure by Letters Patent, is as follows:

1. In mechanism for grinding flats in card-
ing-engines, a guide-piece freely movable to-
ward and away from the grinding-roll and
provided with a guide proper having its under
5 face along which the working seatings of the
flats travel of the same curvature as that of
the bend over which the said working seat-
ings travel when the flats are carding, a pat-
tern cam or former, and operating mechanism
10 therefor, for actuating, and controlling the
movements of said guide-piece, and a presser
whereby the flats are held pressed up against
the guide proper during the movements of
the guide-piece substantially as and for the
15 purposes hereinbefore set forth.

2. In mechanism for grinding flats in card-
ing-engines, a guide-piece freely movable to-
ward and away from the grinding-roll and
provided with a guide proper having its un-
20 der face of the same curvature as that of the
bend over which the flats travel in carding,
in combination with the flats, an actuating
pattern cam or former connected to and moved
by said flats, and a presser whereby the flats
25 are held up against the guide proper during
the movements of the guide-piece, substan-
tially as and for the purposes hereinbefore,
set forth.

3. The guide-piece freely movable to and
30 from the grinding-roll, and having a guide
proper, in combination with a presser for
holding the flats up against said guide proper,
a pattern cam or former for actuating said
guide-piece, a shaft on which said pattern
35 cam or former is mounted, a cog-wheel on
said shaft, and the revolving flats formed to
engage and rotate said cog-wheel, substan-
tially as and for the purposes hereinbefore set
forth.

4. In mechanism for grinding flats in card-
ing-engines, and in combination, a guide-piece
movable to and from the grinding-roll, and
provided with a guide having its under face
45 of the same curvature with that of the bend
over which the flats travel in carding; means

whereby said guide-piece is caused to gradu-
ally rise as the grinding of each flat progresses
and then to drop to its original position; and
a presser whereby the flats are held up against
the guide during the movement of the latter, 50
substantially as and for the purposes herein-
before set forth.

5. In mechanism for grinding flats in card-
ing-engines, the combination of a pivoted
guide-piece movable upon its axis to and from 55
the grinding-roll, a presser mounted on and
carried by said guide-piece and acting to hold
the flats up against the guide-face on said
guide-piece, and mechanism whereby said
guide-piece is caused to move toward and 60
away from the grinding-roll at the times and
in the manner substantially as hereinbefore
set forth.

6. The pivoted guide-piece movable upon
its axis to and from the grinding-roll, and 65
mechanism whereby said guide-piece is caused
to move, intermittently and at the proper
time, toward and away from said roll, in com-
bination with a pressing-lever carried by and
fulcrumed in said guide-piece, and a presser 70
mounted on and carried by said lever, for
holding the flats up against the guide-face on
the guide-piece, substantially as and for the
purposes hereinbefore set forth.

7. In mechanism for grinding flats in card- 75
ing-engines, the combination of the pivoted
guide-piece J provided with guide proper K,
the lever O fulcrumed in said guide-piece, the
presser M carried by said lever, the pattern-
cam H, its shaft and cog-wheel F, and the re- 80
volving flats adapted to engage and rotate
said cog-wheel—under the arrangement and
for joint operation, substantially as herein-
before set forth.

In testimony whereof I have hereunto set 85
my hand this 12th day of February, 1896.

JAMES C. POTTER.

Witnesses:

SOLOMON ROBERTSON,
E. S. NAGLE.