

(No Model.)

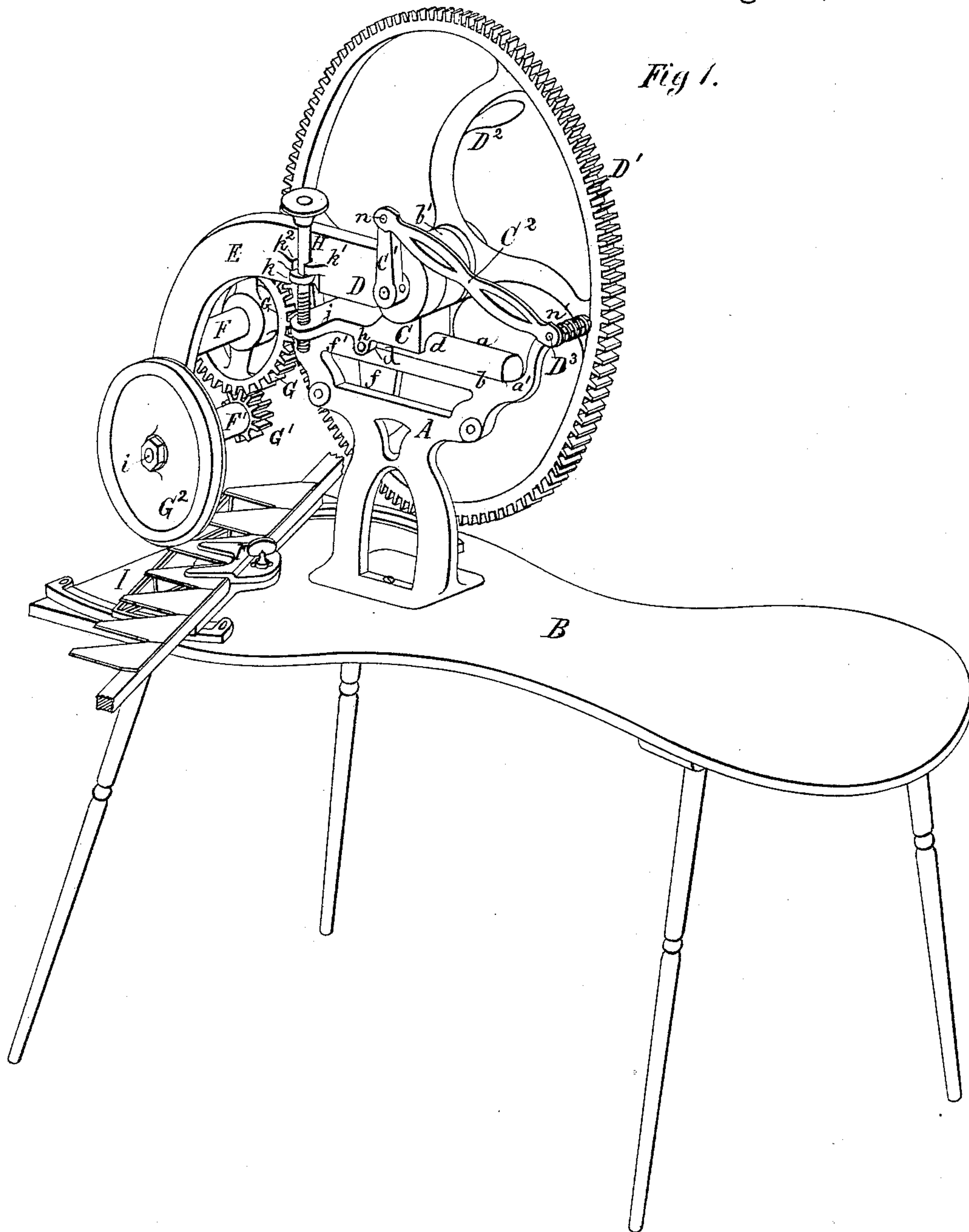
3 Sheets—Sheet 1.

J. M. CONNEL.

MACHINE FOR SHARPENING MOWER AND REAPER KNIVES.

No. 325,159.

Patented Aug. 25, 1885.



Witnesses:
J. P. Theo. Lang.
B. C. Fenwick.

Inventor:
James M. Connel,
by his attys
Fenwick & Lawrence

(No Model.)

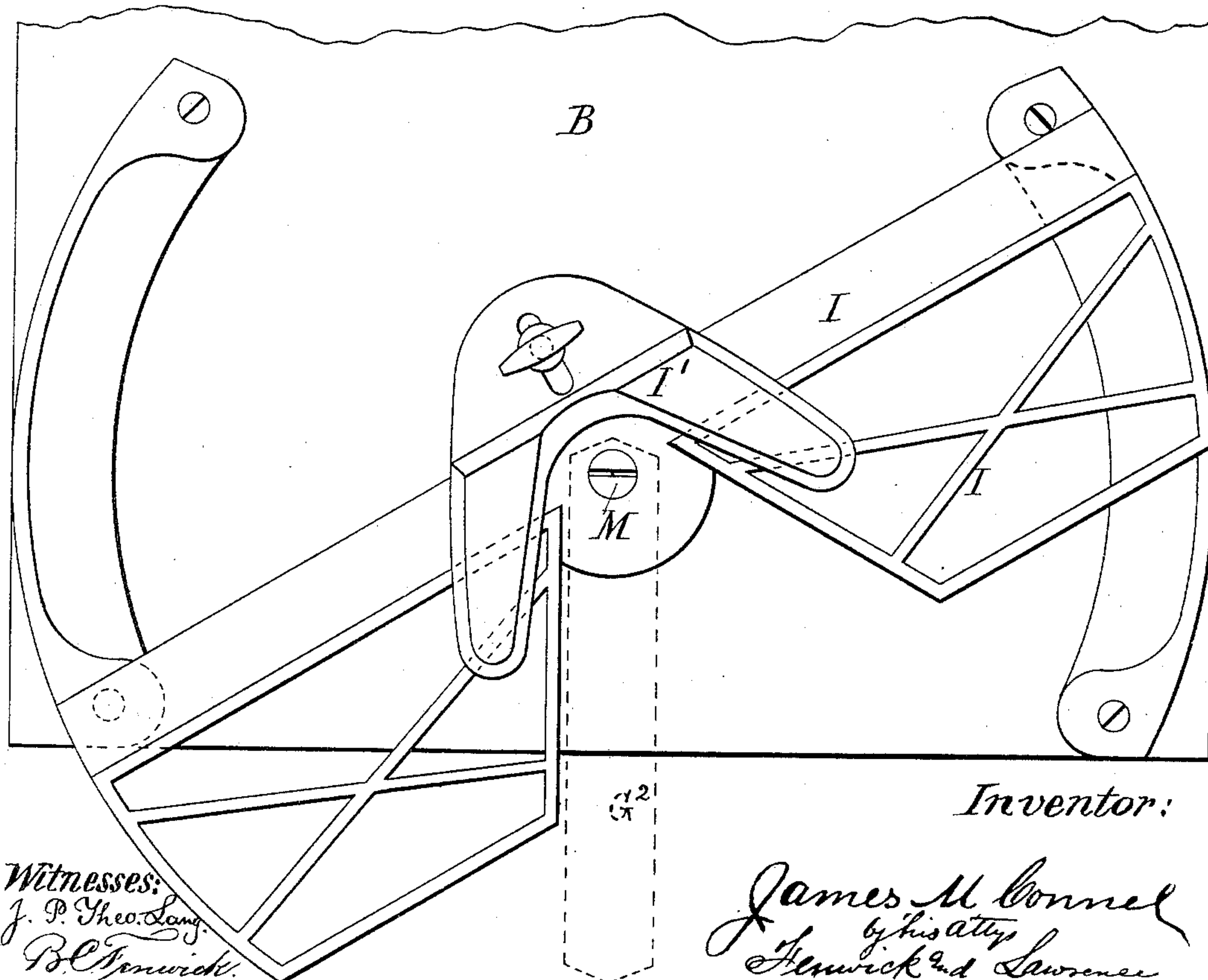
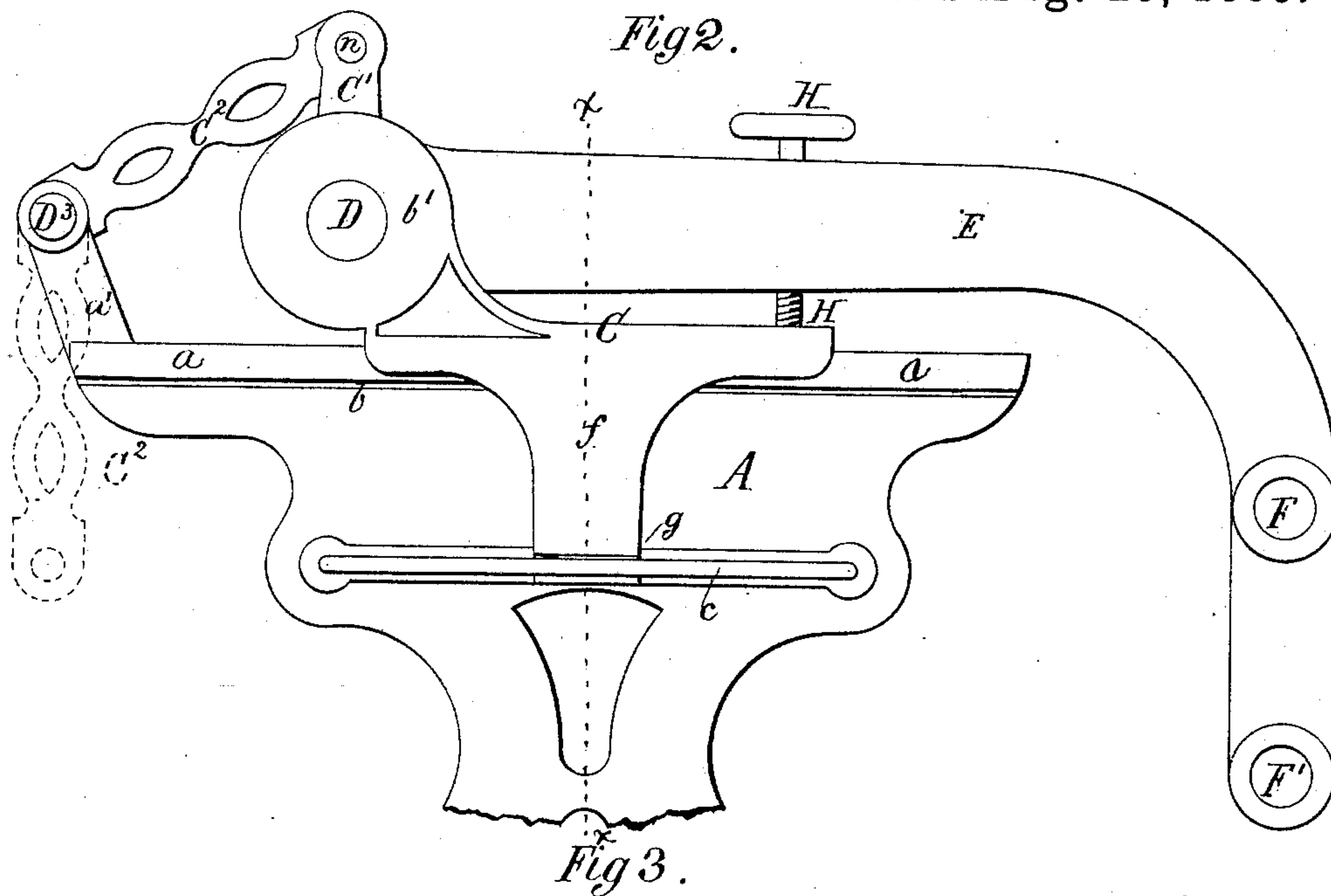
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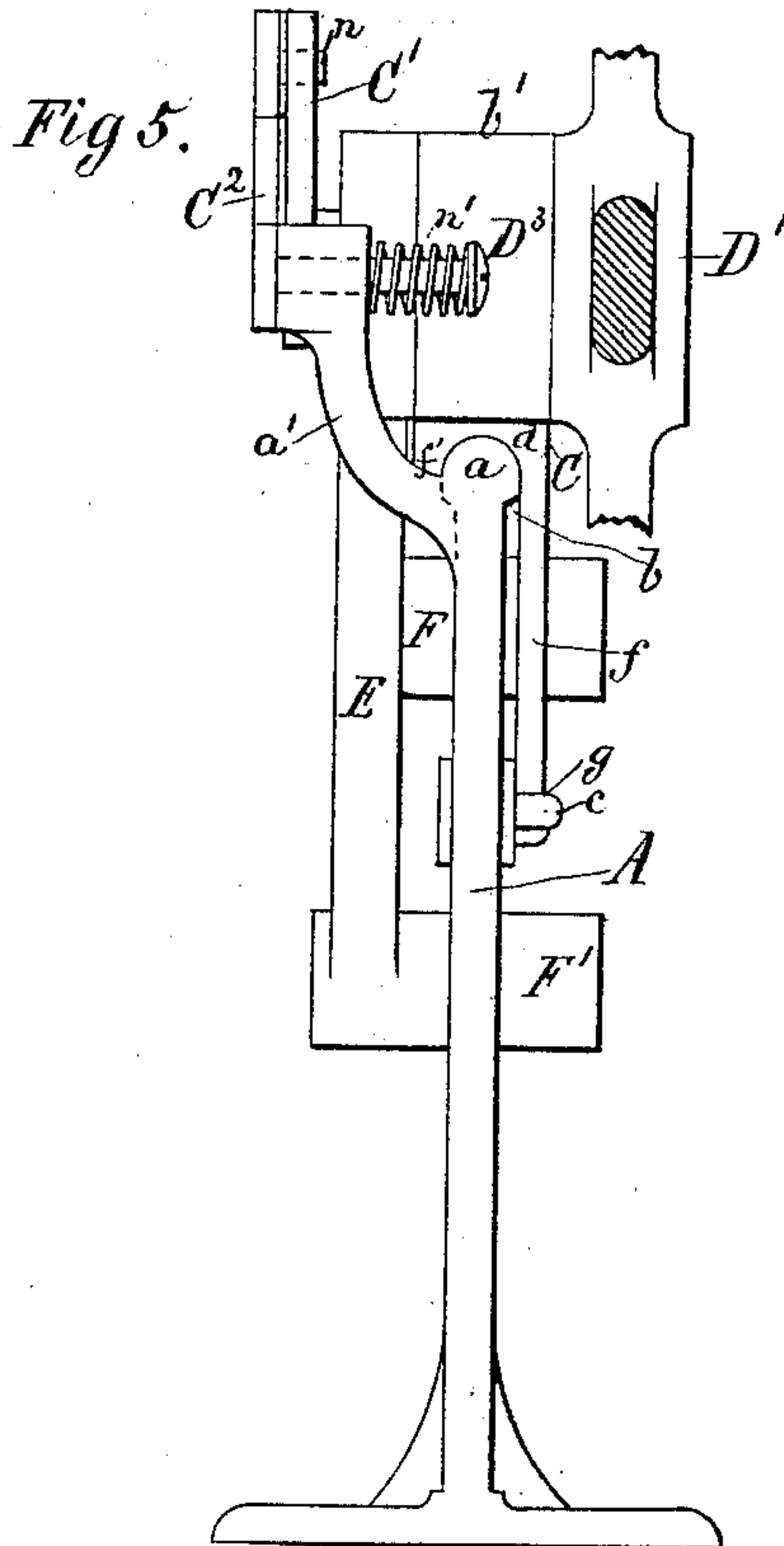
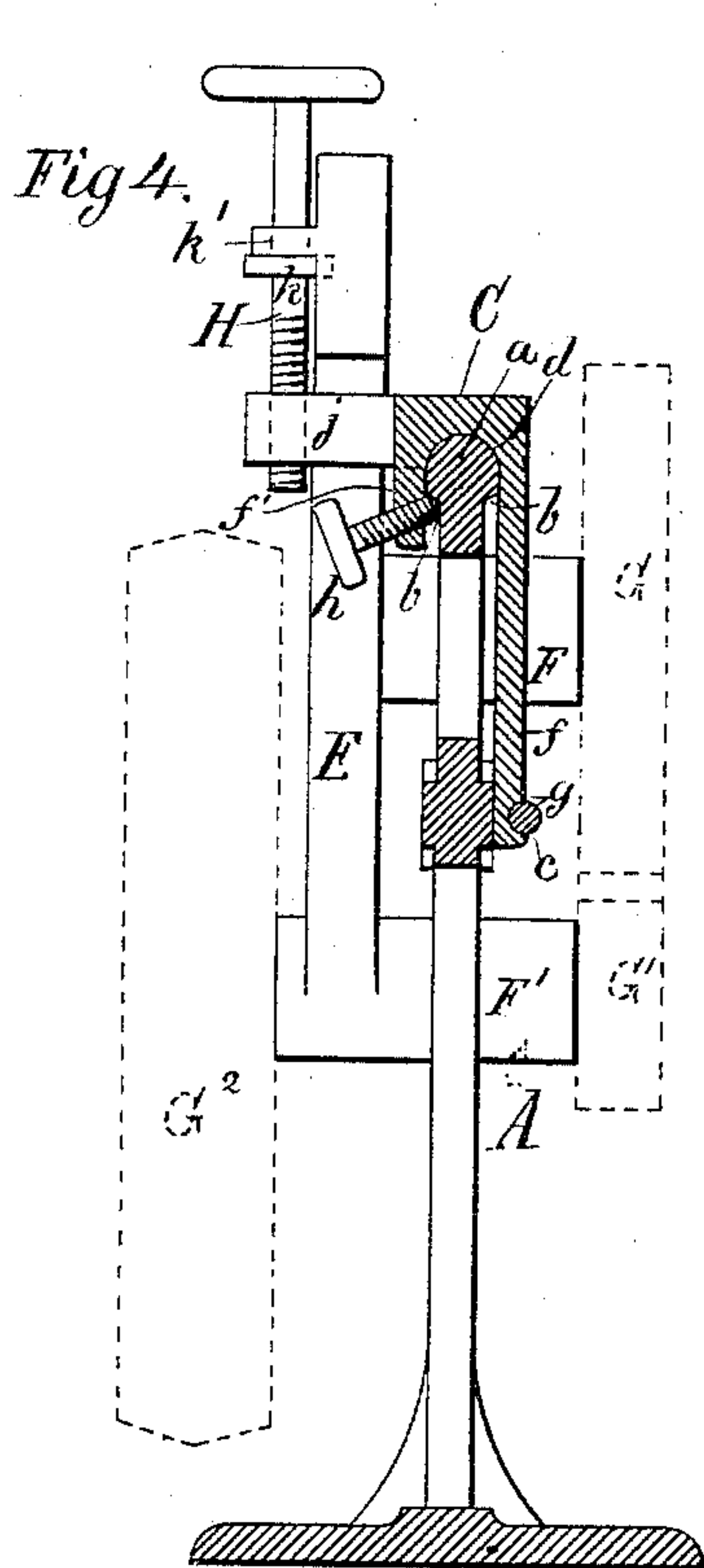
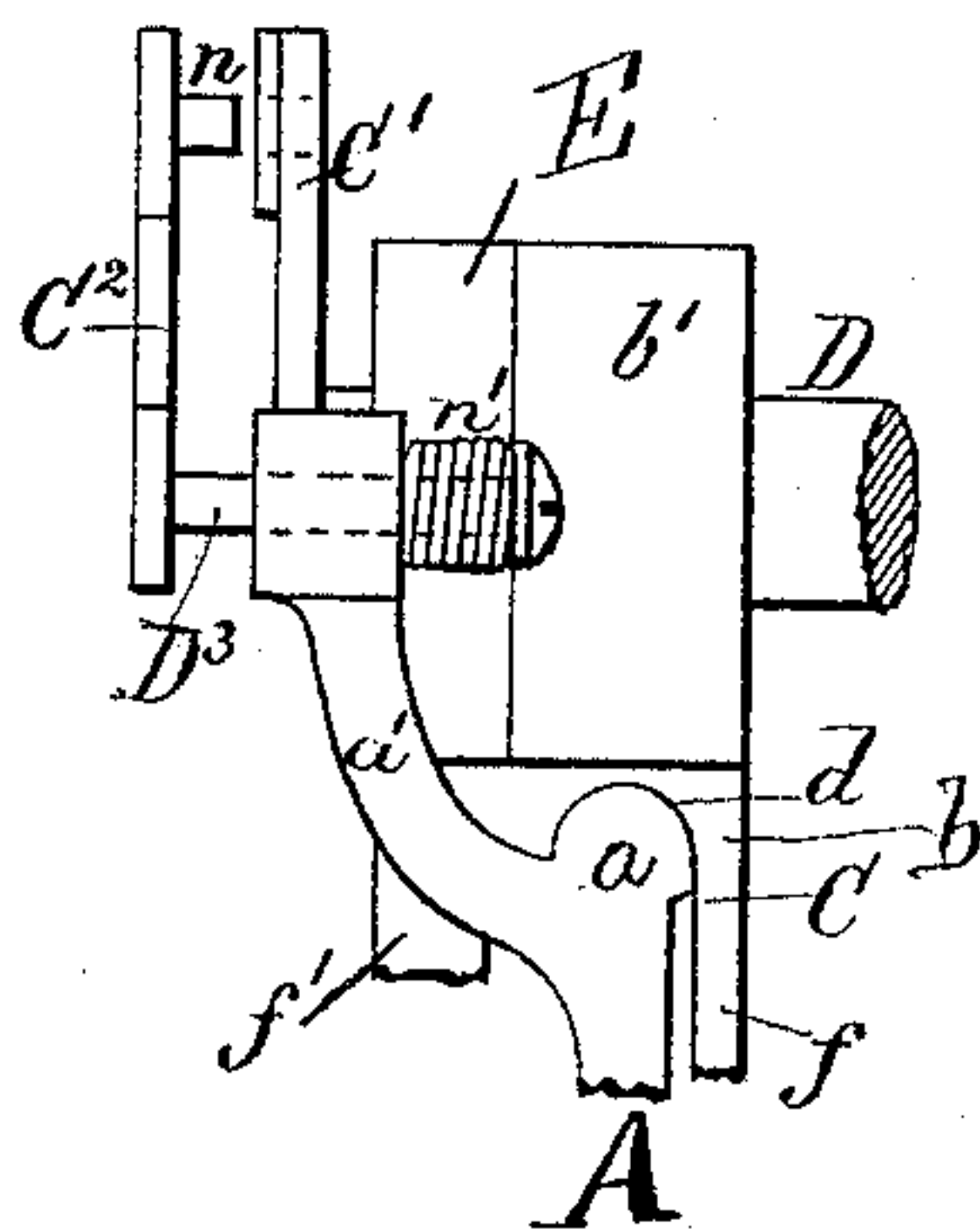


Fig 6.



Witnesses:

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UNITED STATES PATENT OFFICE.

JAMES M. CONNEL, OF NEWARK, OHIO.

MACHINE FOR SHARPENING MOWER AND REAPER KNIVES.

SPECIFICATION forming part of Letters Patent No. 325,159, dated August 25, 1885.

Application filed June 20, 1884. (No model.)

To all whom it may concern:

Be it known that I, JAMES M. CONNEL, a citizen of the United States, residing at Newark, in the county of Licking and State of Ohio, have invented a new and useful Machine for sharpening Mower and Reaper Knives, of which the following, in connection with the accompanying drawings, is a specification.

My invention relates to machines for sharpening mower and reaper knives by rotary emery or other grinding-wheels; and my invention consists in a slip-coupling contrivance whereby the pitman or connecting-arm can be disconnected and the machine reciprocated at the will of the operator, and thus facility afforded for keeping the grinding-wheel a longer or shorter time in contact with certain portions of the knife, as occasion may require.

In the accompanying drawings, Figure 1 is a perspective view of my improved machine for sharpening mower and reaper knives, the cutter-bar, with knives, being shown clamped upon the pivoted head-rest, and all the parts in position for performing the operation of sharpening the knives. In this view the contrivance for automatically reciprocating the revolving grinding-wheel is shown in its connected condition. Fig. 2 is a broken side view showing a portion of the machine, and illustrating by full lines the connected and by dotted lines the disconnected condition of the pitman or connecting-arm which automatically reciprocates the carriage and grinding-wheel. Fig. 3 is a plan or top view of the pivoted head-rest and clamp and a portion of the base of the machine, the grinding-wheel being shown by dotted lines. Fig. 4 is a vertical cross section, in the line *x x* of Fig. 2, of the standard and carriage of the machine, the grinding-wheel and front gear-wheels being shown in dotted lines. Fig. 5 is a back view of the standard and carriage of the machine, showing one arm of the geared driving-wheel in section and two other arms thereof partly broken away, the front gears and grinding-wheel not being shown; and Fig. 6 is a detail view showing portions of the crank-arm, its shaft, standard, carriage, pitman or connecting-arm, and the disconnecting device of the pitman or connecting-arm.

In said drawings, A is a skeleton or open standard formed of a single plate provided with base flanges by which it is fastened to a seat or platform, B. The upper or saddle rail of this standard is made of proper length and segmental in form in cross-section, being thicker than the panel or web portion of the standard, and its base forming, with the web, two beveled shoulders, *b*, as shown. On one side of this standard a staple-shaped guide formed of a wire or rod, *c*, is applied, said wire being located a considerable distance below the shoulders *b* of the rail.

C is a reciprocating carriage having its underside or edge formed with a groove, *d*, corresponding with the saddle-rail *a*. On one side of this carriage a long leg or extension portion, *f*, is provided, while on the other side a shorter leg or extension portion, *f'*, is formed. The portion *f* is grooved, as at *g*, on its outer face, and receives snugly into its groove the guide rod or wire *c*. Through the other leg, *f'*, a screw or pin, *h*, is passed, and bears with its conical end against one of the shoulders *b* of the saddle-rail *a*, as shown. By means of the two portions *f f'*, and the guide wire or rod *c*, and the screw or pin *h*, the carriage is kept vertical and stayed against any tendency to a lateral deflection either right or left, and its back and forward movements on the rail are thus rendered true and steady. With a machine for grinding harvester-knives it is very essential that there shall be no chance for the slightest deviation of the carriage which carries the grinding-wheel from a perpendicular position with respect to the base of the head-rest I, and it is also important to have the parts A and C offer as little resistance or work with as slight friction as practicable; and to this end I have adopted the described construction of standard and saddle-rail, and the grooved carriage with extensions *f f'*, and by the same the object desired is well accomplished, while strength and lightness are secured.

The carriage C is provided with a bearing-hub, *b'*, and in this hub a revolving shaft or axle, D, having a crank-arm, C', on one end and a large toothed driving-wheel, D', on the other end, is fitted. The driving-wheel is provided with a handle, D², while the crank-arm

C' is connected, by means of a slip-coupling pin, n , to a pitman or connecting-arm, C^2 , which, by a sliding pivot, D^3 , and a spiral spring, n' , is connected to a bracket, a' , of the standard A, as shown. The spiral spring n' is placed around the pivot, bearing with its ends against the head of the pivot and an enlargement of the bracket; and it serves for holding the slip-coupling pin n connected with the crank-arm c^2 when not compressed, but permits the pitman to be disconnected when the spring is compressed.

Between the crank-arm C' and the hub b' a pendent arm, E, is fitted upon the axle D, so as to turn freely thereon in a vertical plane. On this arm two tubular bearing-boxes, F F', are formed, and in the same shafts or axles, as i , are fitted. On one of the axles a spur-wheel, G, is keyed, while on the other a pinion, G', and the revolving emery or other grinding wheel G^2 , are firmly fastened. The spur-wheel G' and grinding-wheel G^2 are driven rapidly by the wheel G, which is driven by the toothed wheel D', as clearly indicated in Fig. 1 of the drawings.

The arm E is supported forward of its axle D by means of an adjusting-screw, H, which is screwed into a screw-tapped projecting lug or boss, j , of the carriage C. This screw has a collar or shoulder, k , which comes beneath a slotted projection, k' , of the arm E, while the body portion of the screw enters the open slot k^2 of the projection, as shown. Thus the arm is sustained against any descent beyond that which the screw will permit, while it is free to rise with the grinding-wheel and gearing whenever the resistance offered by the knives being sharpened is great enough to overcome the weight of the arm and its attachments.

The great utility of this adjusting contrivance or screw H will be seen when it is considered that the rapid revolution of the grinding-wheel in contact with the knives produces a tremulous vibration of the pendant arm E, and that the operator, who has heretofore held this arm in his hand during its adjustment, is so influenced by said motion that it is almost impracticable for him to make the adjustments in the very nice manner which the nature of the work requires; but with the screw H, tapped into the carriage C, which is firmly supported upon the saddle-rail of the standard A, the adjustment and set of the arm can be effected without the operator being affected by the vibrations of the arm, it only being necessary for him to place his hand upon the head of the screw H and give it a slight turn to the right or left, accordingly as the arm may be required to be raised or lowered. This screw adjustment renders the grinding of harvester-knives by machinery perfectly practicable, and by its use the action of the pivoted head-rest I, with clamping contrivance I', as well as the grinding-wheel, is rendered very sure and certain after the said pivoted head-rest, with clamp, has been adjusted for holding the knives at a

certain angle with respect to one or the other of the bevels of the grinding-wheel.

It will be understood that the screw-adjusting contrivance does not support the pendant arm during the act of grinding or sharpening the cutters, except at such times as the operator may turn the screw far enough to suspend the arm and its attachments on it. The screw contrivance serves specially as a means of adjustment, whereby the desired gage of cut of the grinding-wheel may be secured and the action of the grinding-wheel arrested when that depth of cut has been effected. Besides this, the adjustment can be made upon a foundation which is firm and unaffected by the tremulous action of the grinding-wheel.

From Fig. 3 of the drawings it will be seen that the head-rest I, with its clamp I', is pivoted at M to the platform or seat B. In this view the head-rest is shown turned to one of the angular positions it occupies while one of the bevel edges of a knife is being sharpened. A reverse adjustment of this rest will enable the other beveled edge of the knives to be sharpened, as will be well understood.

In the operation of a machine such as herein described it is practicable for a skilled operator to reciprocate the carriage at his will without the aid of the automatic reciprocating attachment shown, he simply moving the carriage forward or backward by the handle D^2 , while he has the handle under his control for turning the grinding-wheel. This mode of operation is desirable, as it enables the operator to dwell more or less upon different portions of the knives, as the necessity of the case may require—as, for instance, when it is necessary to grind out a nick or reduce one portion more than another—and when this can be done at the will of the operator it is better not to have the reciprocating motion arbitrarily—that is, once in every revolution of the driving-wheel—but as persons who use these machines cannot at once acquire the skill requisite for their operation in the manner just described, I have provided the crank-arm C' and pitman or connecting-arm C^2 for giving an automatic reciprocation to the carriage and grinding-wheel, in order that those not fully skilled in the use of the machine may in the beginning operate it with more certainty and ease; and I also have provided a slip-coupling device consisting of a spring, n' , long sliding pivot-pin D^3 , with head, and a short sliding pivot-pin, n , whereby the pitman can instantly, at the will of the operator, be disconnected from the crank-arm of the shaft D, and thus the grinding-wheel be adapted for being reciprocated at the will of the operator.

To accomplish the disconnection of the pitman, the operator places his thumb on the screw-nicked button-head of the pin D^3 and applies pressure sufficient to compress the spring n' and force the short pin and pitman out of their connected position (shown in Fig. 5) to their disconnected position. (Shown in Fig.

6.) When the pitman is disconnected it drops down to the position shown by dotted lines in Fig. 2. The pitman having been disconnected, the operator can at his will reciprocate the carriage and grinding-wheel in such a manner as to have the grinding-wheel remain a longer or shorter time grinding upon any particular portion of the knives.

Whenever it is again desired to have the reciprocation of the carriage and wheel effected automatically, it can be done by stopping the grinding operation a moment and readjusting the pitman or arm in its connected position with the crank-arm.

The contrivance for reciprocating the grinding-wheel during the grinding operation will answer a very useful purpose for aiding unskillful operators, especially when the machine is used for sharpening new or nearly new knives; but while I claim the combina-

tion of the contrivance for automatically reciprocating the grinder with the grinding mechanism herein described, I do not confine myself to its use, as a good machine for use by skilled operators can be made if it is dispensed with.

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

The combination, with the slip-coupling contrivance consisting of the pitman or connecting-arm C^2 , pins D^3 and n , and spring n' , of the standard A , reciprocating carriage C , shaft D , crank-arm C' , grinding-wheel G^2 , and gearing $D' G G'$, for operating the shaft, crank-arm, carriage, and grinding-wheel, substantially as and for the purpose described.

JAMES M. CONNEL.

Witnesses:

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B. C. FENWICK.