

(No Model.)

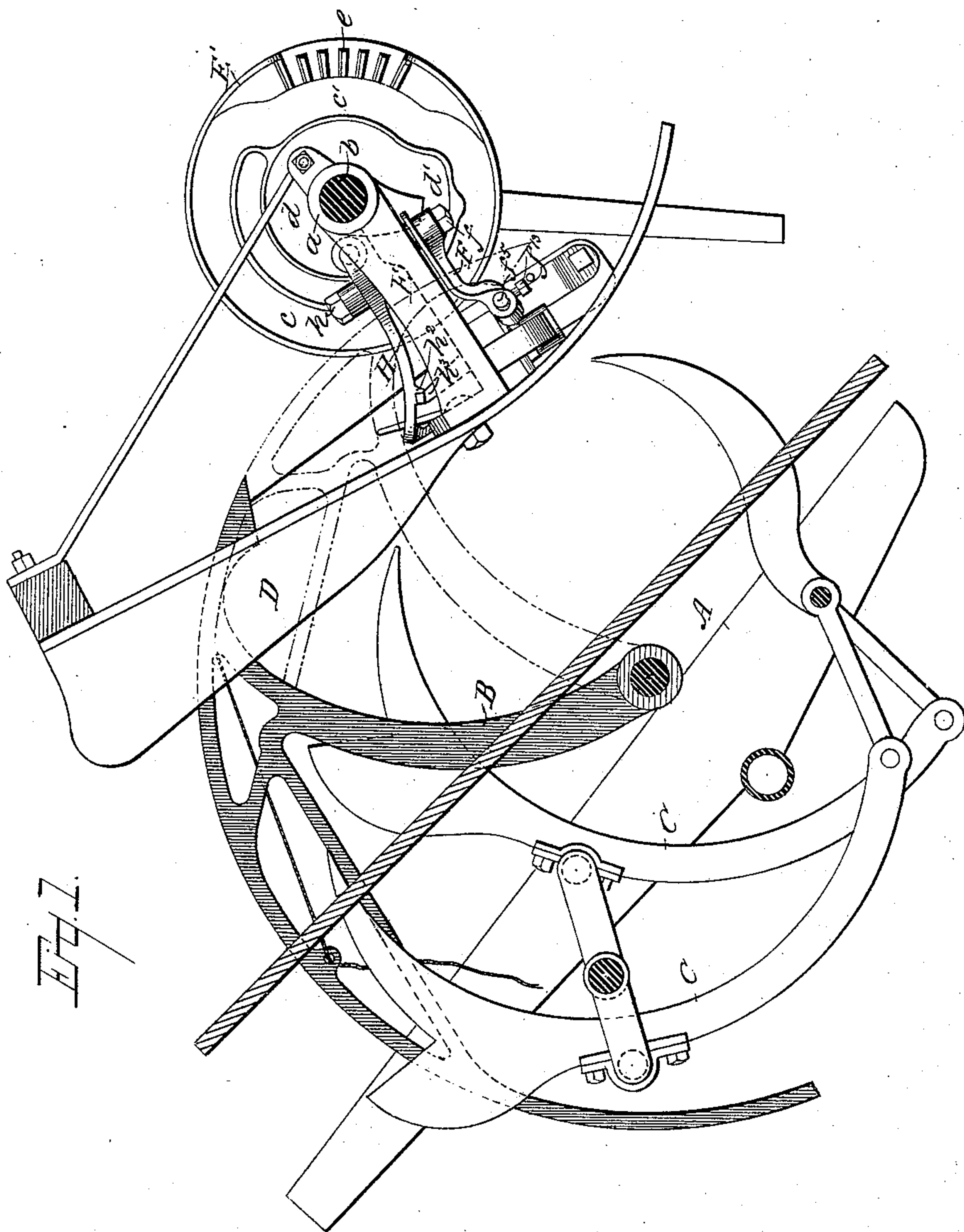
3 Sheets—Sheet 1.

C. M. YOUNG.

GRAIN BINDER.

No. 322,770.

Patented July 21, 1885.



Witnesses:

E. G. Jones
M. H. H. H. H.

Inventor:

Charles M. Young

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(No Model.)

3 Sheets—Sheet 2.

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Fig. 2.

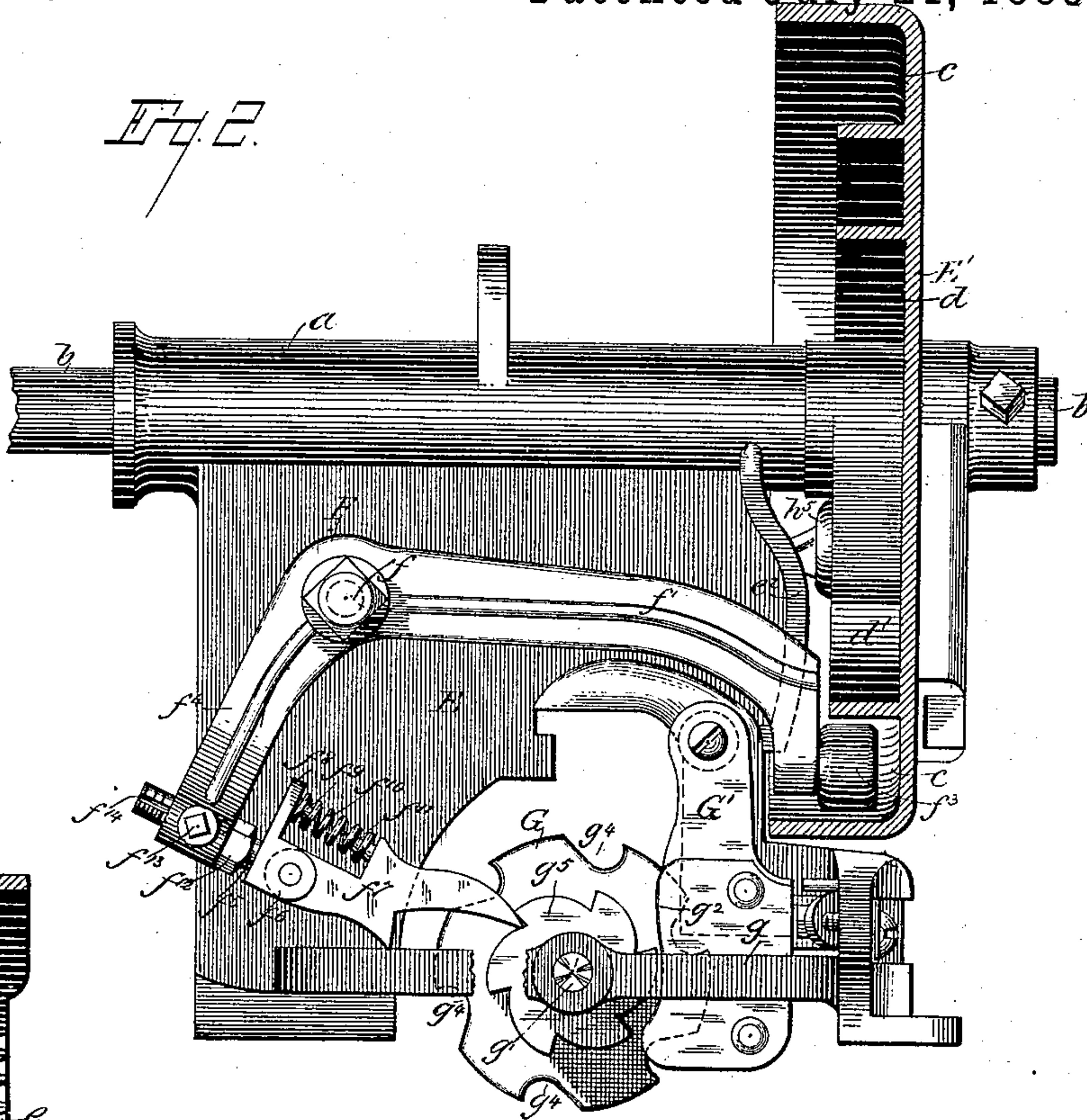


Fig. 3.

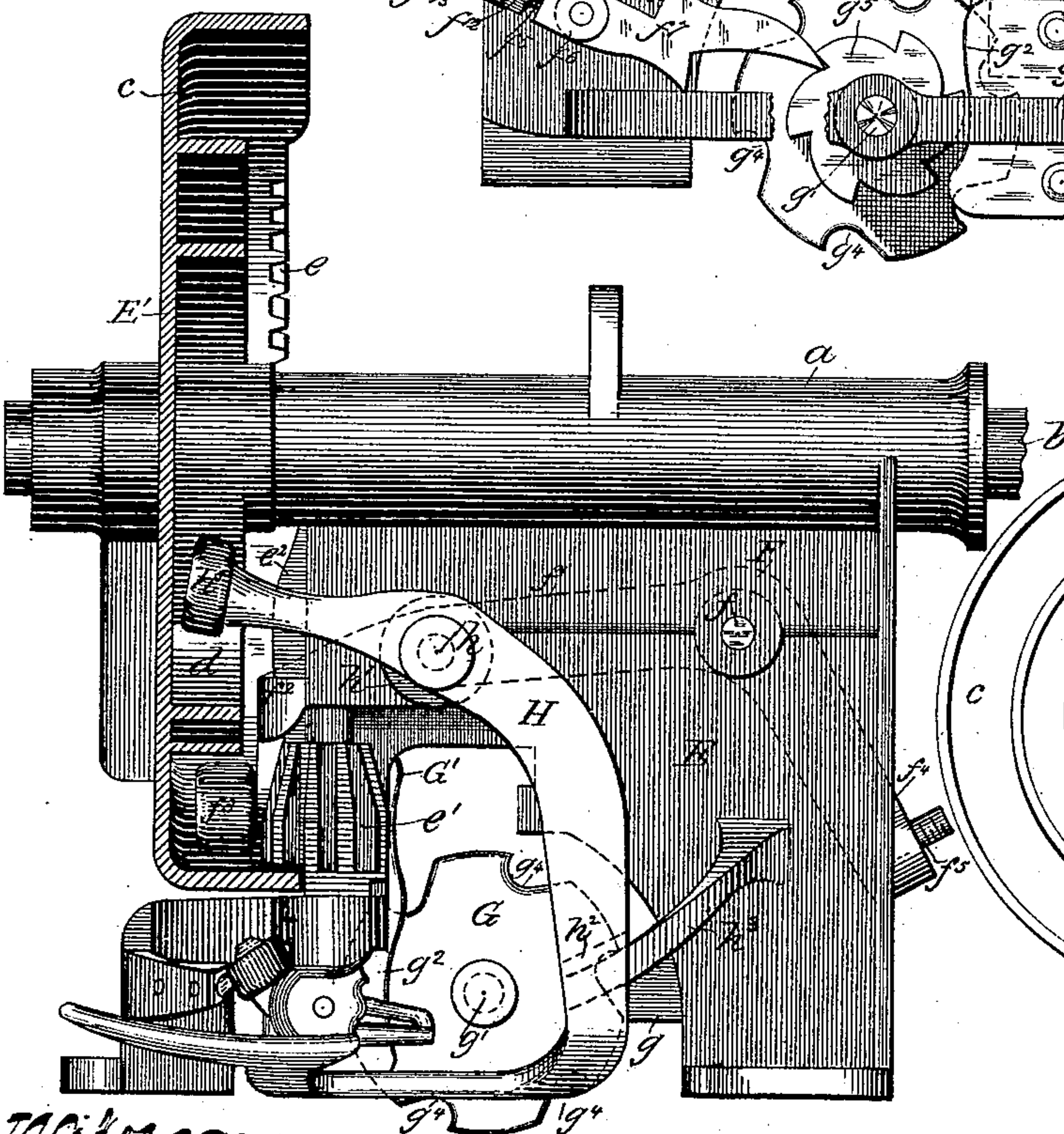
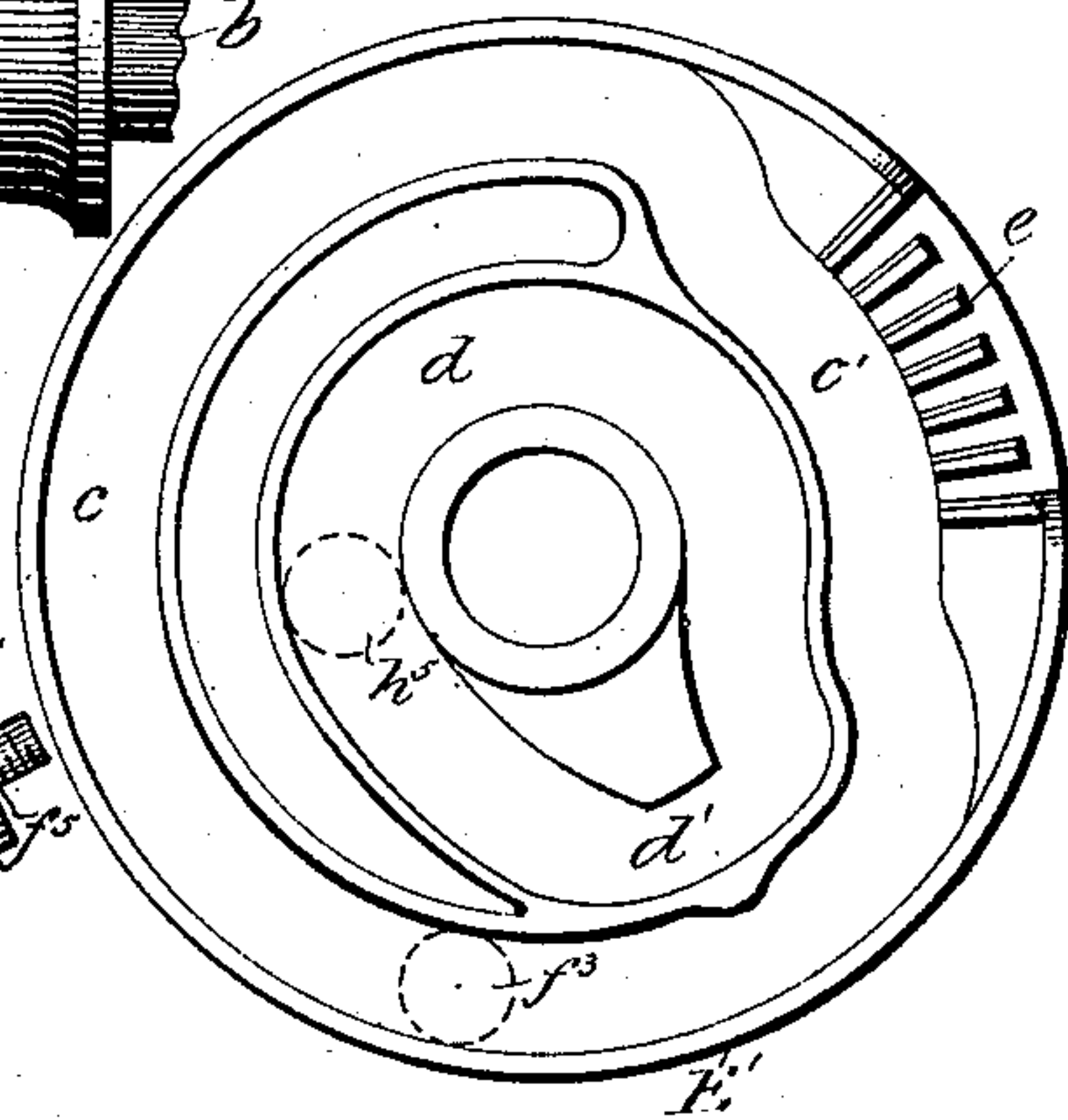


Fig. 4.



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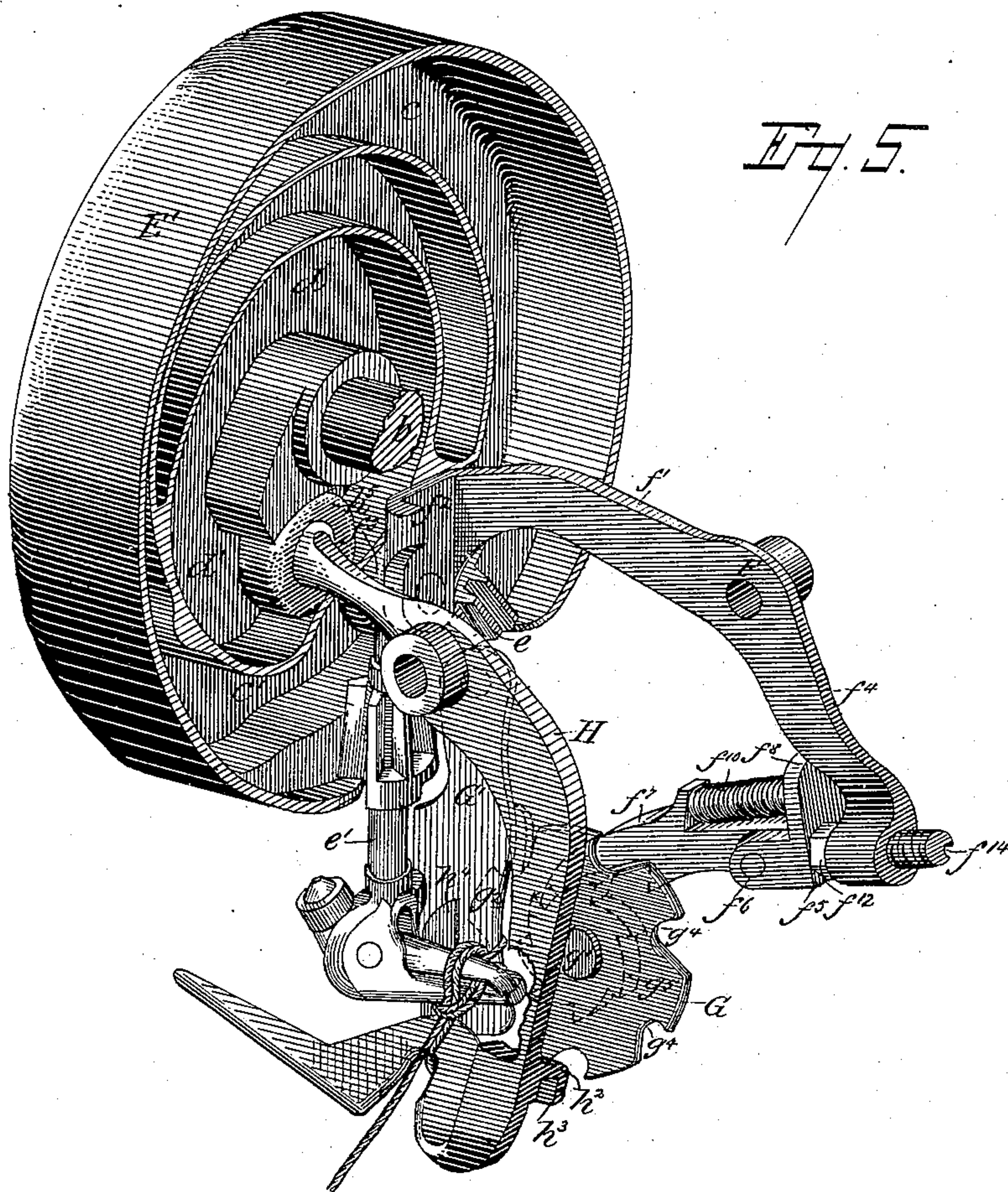
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C. M. YOUNG.
GRAIN BINDER.

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UNITED STATES PATENT OFFICE.

CHARLES M. YOUNG, OF MILWAUKEE, WIS., ASSIGNOR OF ONE-HALF TO THE DENNETT HARVESTING MACHINE COMPANY, (LIMITED,) OF SAME PLACE.

GRAIN-BINDER.

SPECIFICATION forming part of Letters Patent No. 322,770, dated July 21, 1885.

Application filed February 25, 1884. (No model.)

To all whom it may concern:

Be it known that I, CHARLES M. YOUNG, of Milwaukee, in the county of Milwaukee, and in the State of Wisconsin, have invented certain new and useful Improvements in Grain-Binders; and I do hereby declare that the following is a full, clear, and exact description thereof.

My invention relates to devices for operating the cord-holder in grain-binders; and it consists in peculiarities of construction, as will be fully described hereinafter.

In the drawings, Figure 1 is a vertical section through the grain-table of the binder, showing the needle in position after the twine has been cut. Fig. 2 is an outer side view of the knotter-frame; Fig. 3, an inner side view of the same. Fig. 4 shows the construction of the knotter-wheel cam-grooves, and Fig. 5 is a perspective view showing the tying mechanism in position when the knife is moving against the cord.

A is the binder-table, B the needle, (shown both in full and dotted lines,) C C are the grain-packers, and D is the breast-plate, all of which parts are exactly the same as in ordinary binders.

E is the knotter-frame, bolted, as usual, to the breast-plate D. It has the sleeve *a* in its upper end, and in this sleeve is journaled the outer end of the shaft *b*, carrying fast onto it the cam-wheel E', which is irregularly hollowed on its inner face to form an outer cam-groove, *c*, and an inner or central cam-groove, *d*. Opposite the irregular portion *c'* of the cam-groove *c* is formed the segmental gear-teeth *e*, which serve to drive the tyer-shaft *e'*.

Fulcrumed on the bolt *f*, screwed in the outer face of the knotter-frame E, is the bell-crank lever F, whereby the cord-holding disk G is operated. The long arm *f'* of this lever extends toward the cam-wheel E' parallel with the outer face of the knotter-frame E, and a flange, *f''*, is formed on its end. This flange, which projects from the inner face of the lever, extends beyond the inner face of the knotter-frame, against which its end is bent. The inner edge of the flange *f''* is shaped so as to slide freely against the outer edge, *e''*, of the knotter-frame, forming an arc of a circle, the center of which is the fulcrum-bolt *f*, and it is

extended downward opposite the cam-groove *c* of the cam-wheel E to form a bearing for the anti-friction roller *f''* working in said cam-groove. As is obvious, the long arm of the crank-lever is squarely guided along the edge of the knotter-frame, and the pivoting-bolt *f* is freed from any twisting strain in the operation of the devices. The small arm *f'* of the bell-crank lever F is perforated in its enlarged end to receive the threaded end of the adjustable carrier *f''*, the opposite end of which is bifurcated to form a hinge, *f'''*, for the pawl *f''*. A flange, *f''*, projecting from the upper edge of the carrier *f''*, is provided on its outer face with a stud, *f'''*, to support one end of the coiled spring *f''*, the other end of which is held over a like stud, *f''''*, formed on the corresponding notched end of the pawl *f''*. *f''''* is a nut, by means of which the pawl is given its proper adjustments. The carrier *f''* is thereby adapted to move more or less, as desired, out of the perforated end of the lever F, and to be maintained at the proper point by the set-screw *f''''*, the end of which impinges in the groove *f''''* formed in the threaded end of said carrier.

G is the cord-holding disk, loosely mounted on the pin *g'*, held fast in the cross-bar *g* of the knotter-frame.

G' is the shoe between the cheeks *g''* of which one edge of the disk works. This disk is made with the usual six notches, *g'''*, and on its rear face is formed the ratchet *g''''*, which is concentric with the disk G, and has the same number of teeth, their point lying opposite the center of the notch *g'''* and of a shape to take the free end of the pawl *f''*.

H is the knife-arm, which is pivoted on a stud, *h'*, projecting on the inner face of the knotter-frame E and held thereon free to vibrate on its pivoting-bolt *h*. Its rounded upper end, *h'*, is fitted, as usual, to work in the central cam-groove, *d*, of the cam-wheel E. Its lower part is provided on the inner face with a flange, *h''*, the lower edge of which rests against the upper edge of a bracket, *h'''*, that projects from the knotter-frame and forms a curved guide-rail, the center of which is the pivoting-bolt *h* of the knife-arm. As the upper rounded head, *h''*, of said knife-arm travels along the groove of the cam-groove *d* the lower

end of the arm is thus firmly guided along the bracket. This not only relieves the pivoting-bolt h from the twisting strain of the knife-arm, but also prevents any lateral displacement of the latter as it is moved back and forth by the cam-groove d .

The operation of my device is as follows: The twine being laid by the needle B into one of the notches g^4 of the holder G, the anti-friction roller f^3 of the bell-crank lever F engages in the irregular portion c' of the cam-groove c . This will force the point of the pawl f^7 against the ratchet g^5 , which it rotates till the notch in which the twine was laid has been received in the cheeks of the shoe G' . The cam-wheel E, making one revolution for every stroke of the needle, the movements of the parts are timed so that at each stroke the twine is laid in a new notch. Immediately after the cord has been drawn in the shoe G' by the disk G the cogged segment e of the cam-wheel acts on the knotter-pinion and shaft e' , and the knot is formed in the usual manner. As soon as this is done the anti-friction roller f^3 is ready to leave the irregular portion c' of its cam-groove c , and as it does causes the pawl f^7 to recede back in position to engage with the next tooth of the ratchet g^5 . In this position the point of the pawl keeps the cord-holder fast in the shoe, as when the knot was being tied, so that when the rounded head h' of the knife-arm H meets with the irregular portion d' of the central cam-groove, d , to move the knife h^4 against the cord this latter can in no possible way be detached from the holder.

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

1. In combination with the knotter-frame E, the bell-crank lever F, the carrier f^5 , supported in the outer arm, f^4 , of said lever, and having a threaded end and a groove, f^{14} , a set-screw, f^{13} , engaging said groove, the adjusting-nut f^{12} , and the spring-pawl f^7 , pivoted in the bifurcated end of the carrier f^5 , substantially as and for the purpose set forth.

2. In a grain-binder, the combination of the cam-wheel E', provided with the cam-groove c , the knotter-frame E, having the curved flange e^2 , and the bell-crank lever F, pivoted to said frame and provided with a hooked flange engaging the curved flange on the frame, and with a roller, f^3 , engaging in said groove c , substantially as and for the purpose set forth.

3. In a grain-binder, the knotter-frame E, having a curved flange, h^3 , in combination with the cord-guiding arm G, pivoted to said frame and provided with a flange, h^2 , adapted to bear against and slide upon said curved flange, substantially as and for the purpose set forth.

In testimony that I claim the foregoing I have hereunto set my hand, at Milwaukee, in the county of Milwaukee and State of Wisconsin, in the presence of two witnesses.

CHARLES M. YOUNG.

Witnesses:

H. G. UNDERWOOD,
M. KAUMHEIMER.