

(No Model.)

W. R. BAKER.
GRAIN BINDER.

No. 357,140.

Patented Feb. 1, 1887.

Fig. 1.

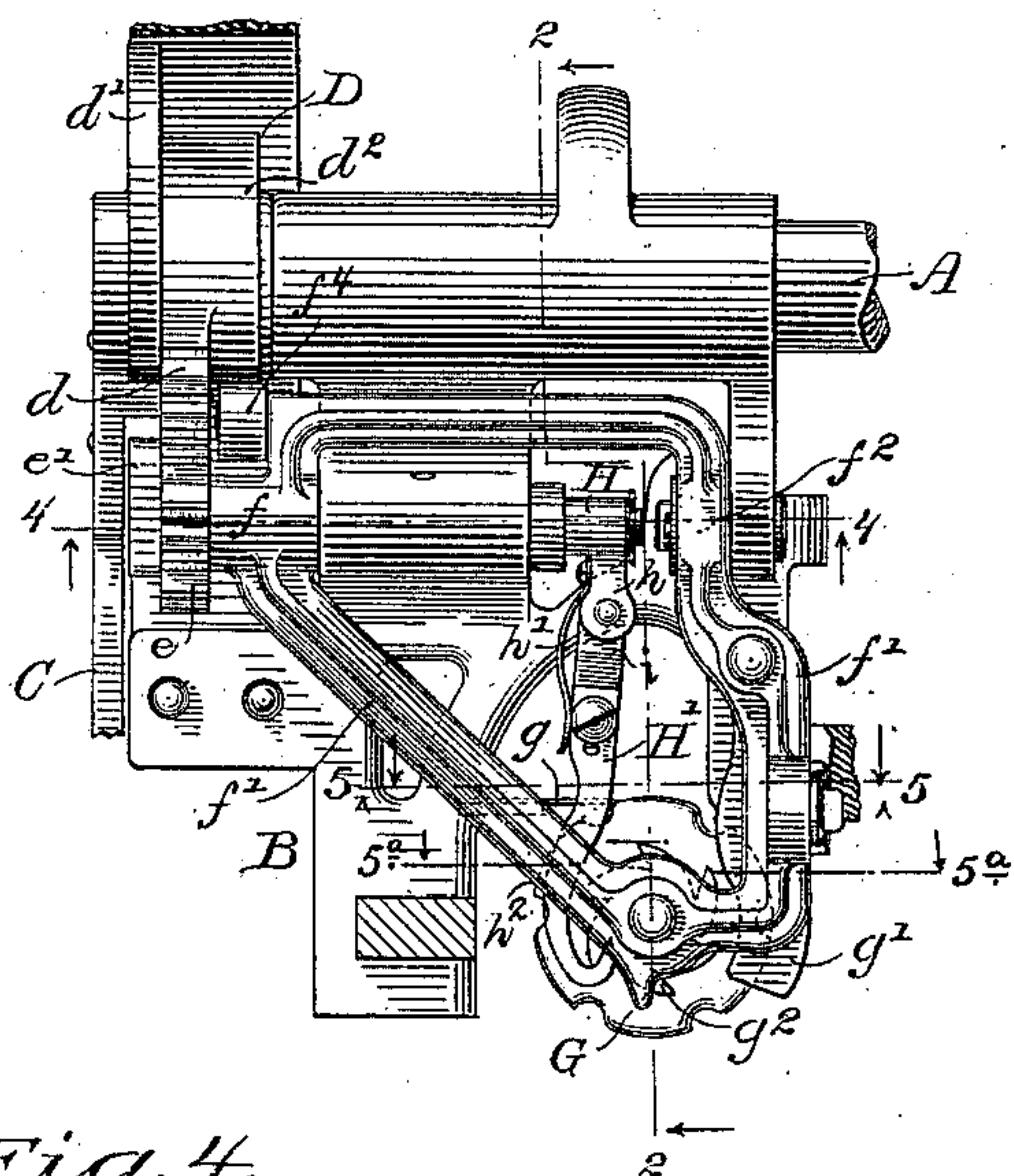


Fig. 2.

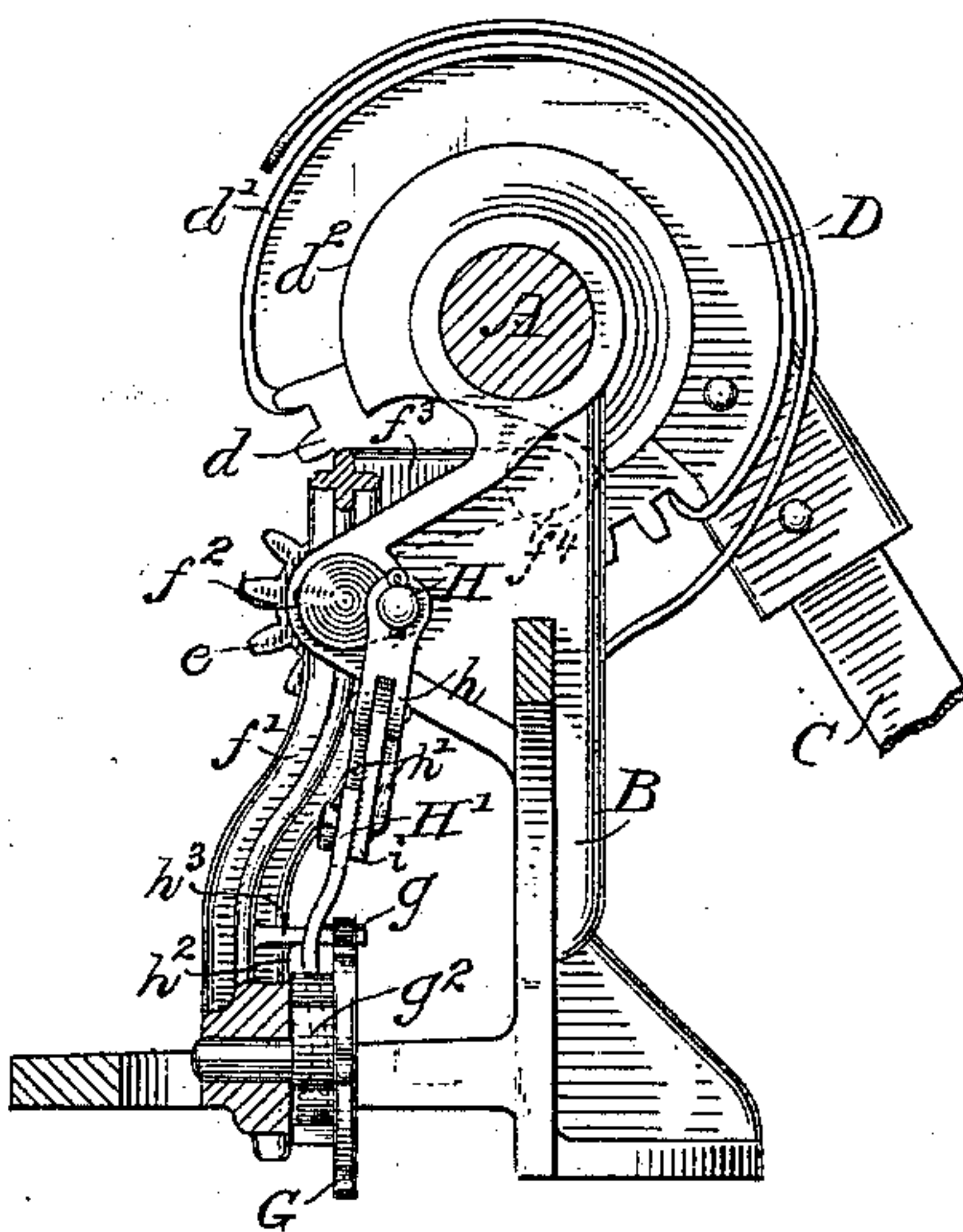


Fig. 4.

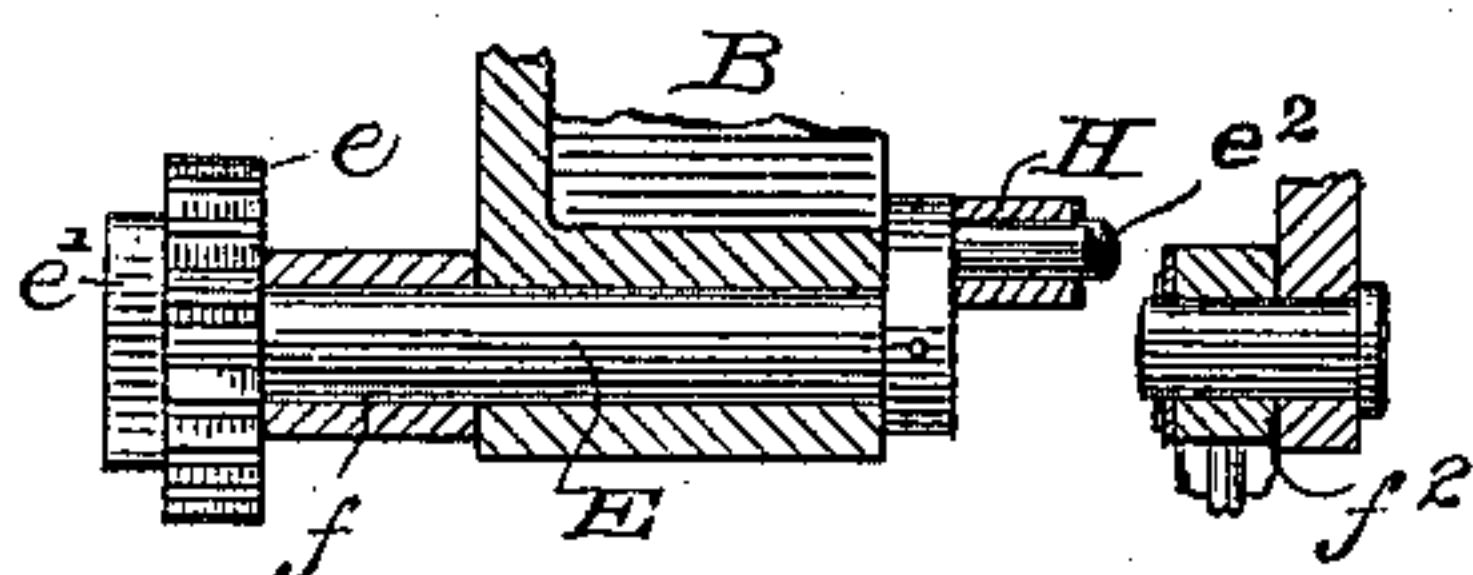


Fig. 3.

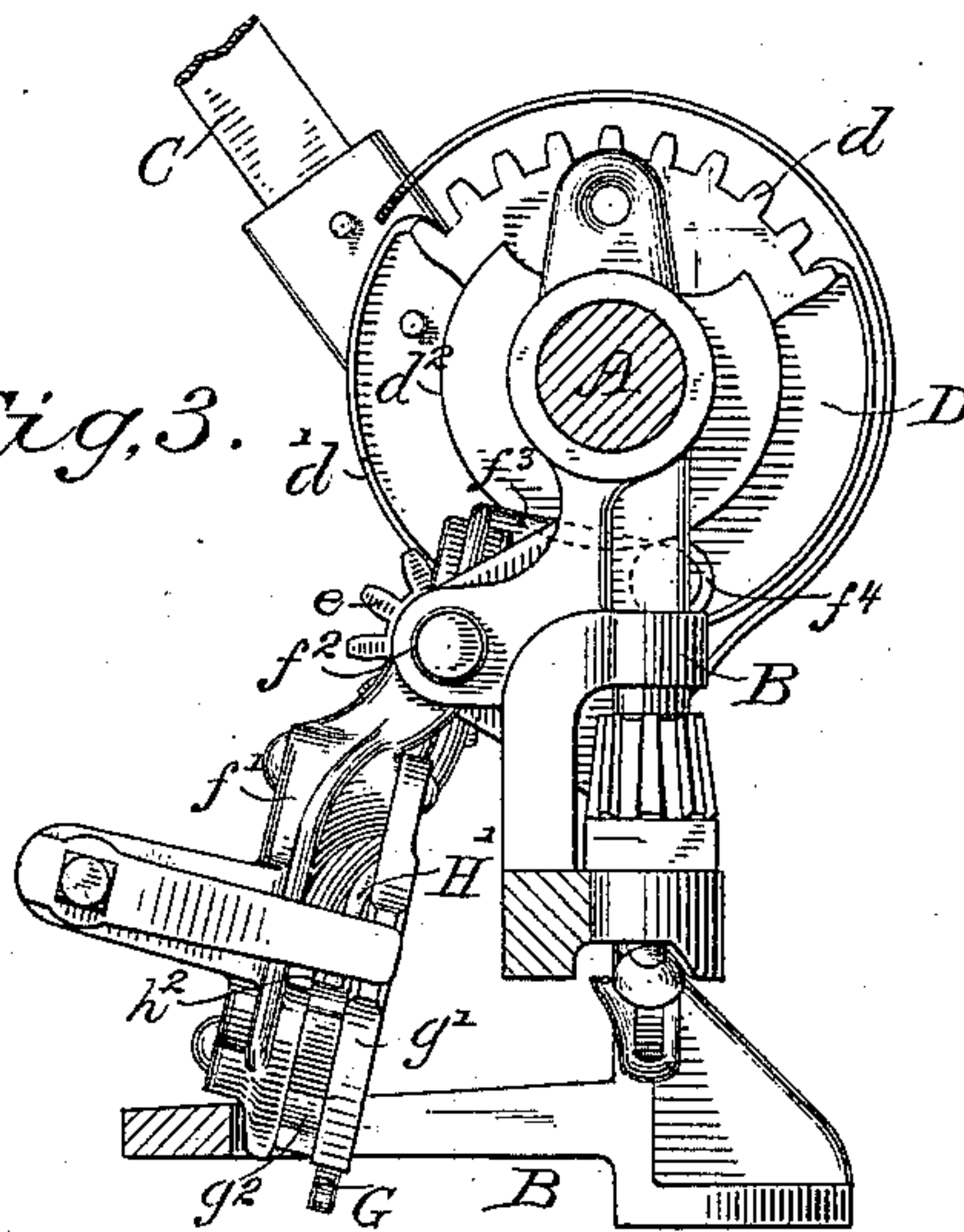


Fig. 5.

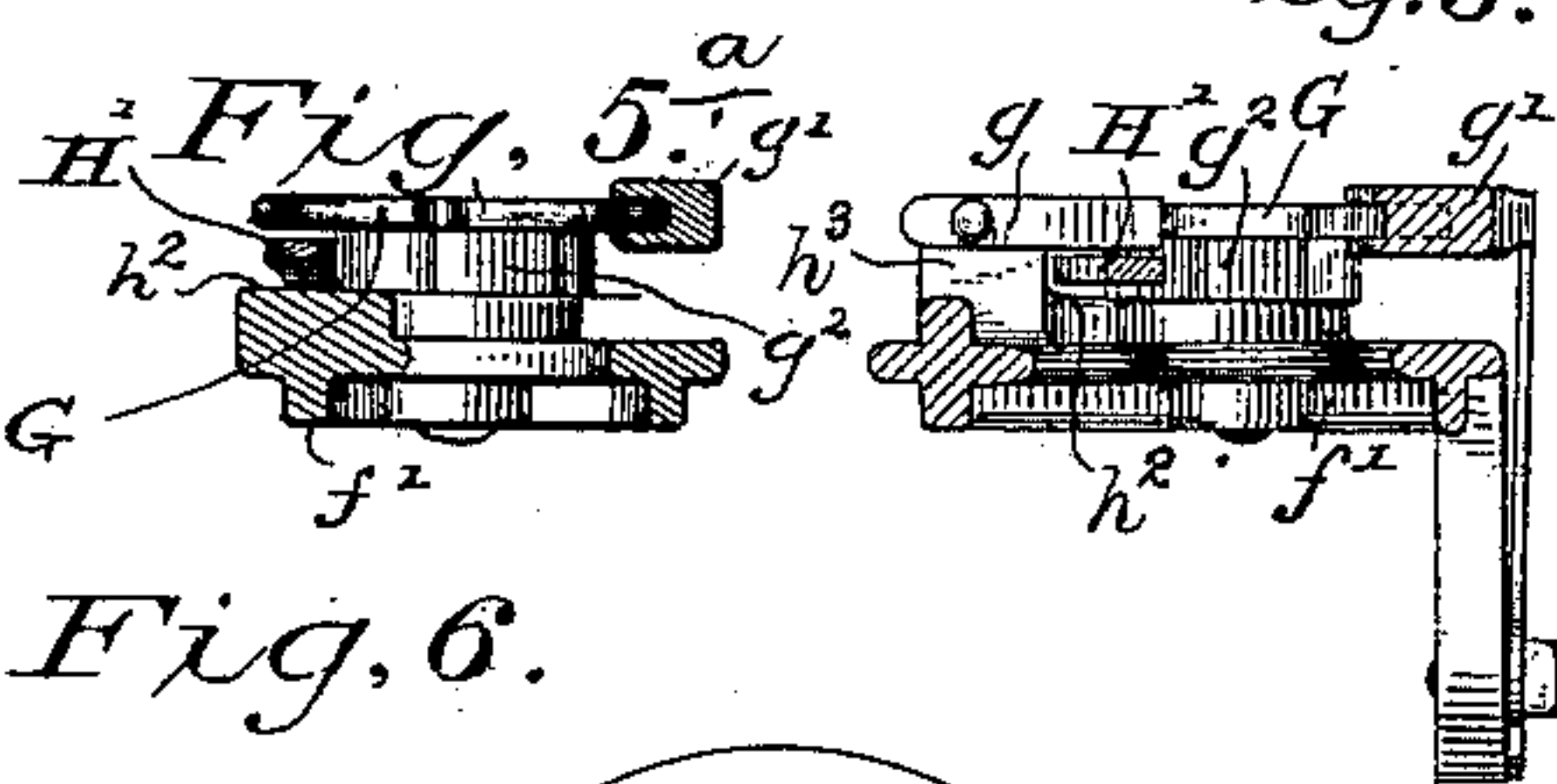


Fig. 6.

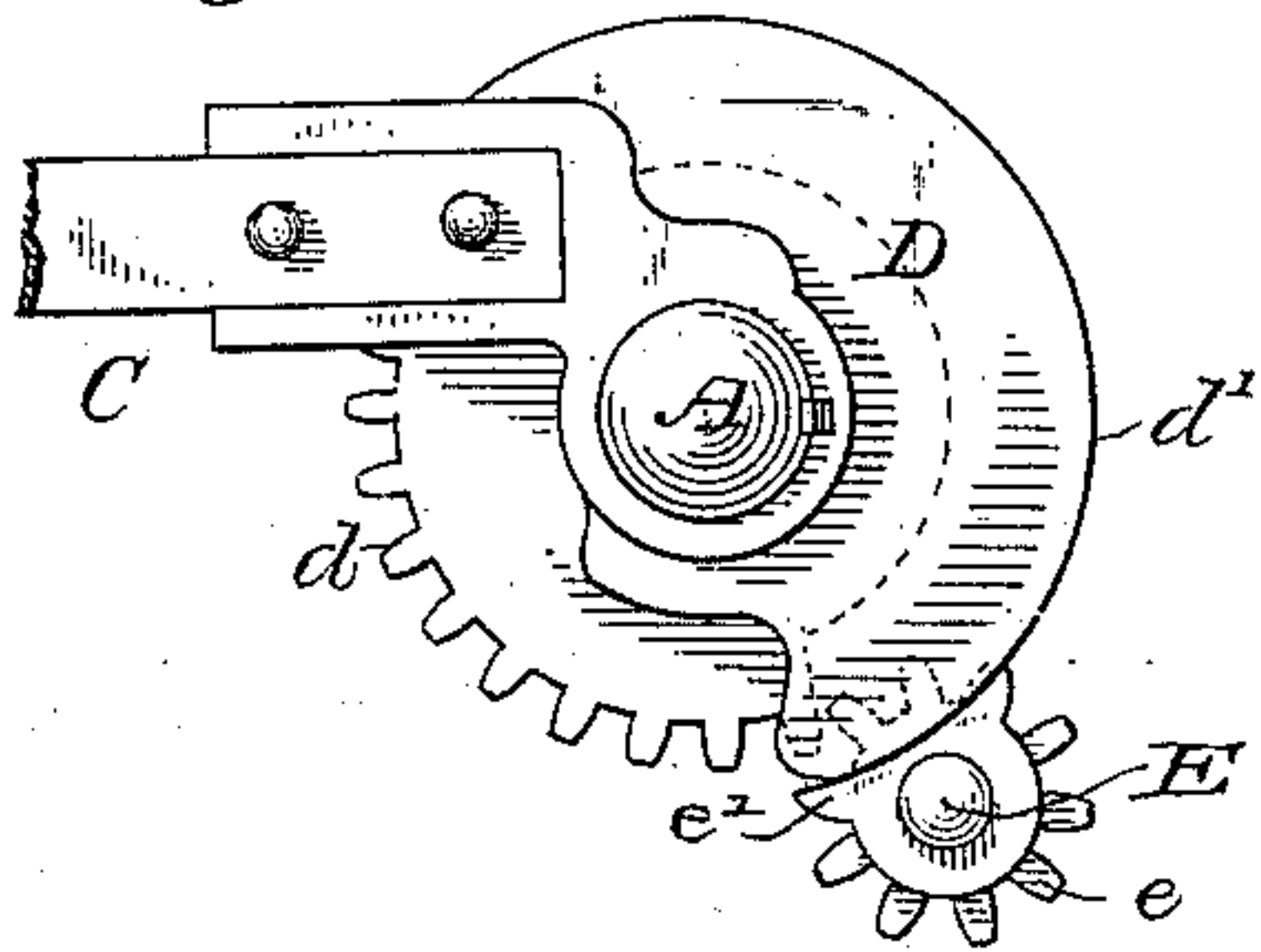
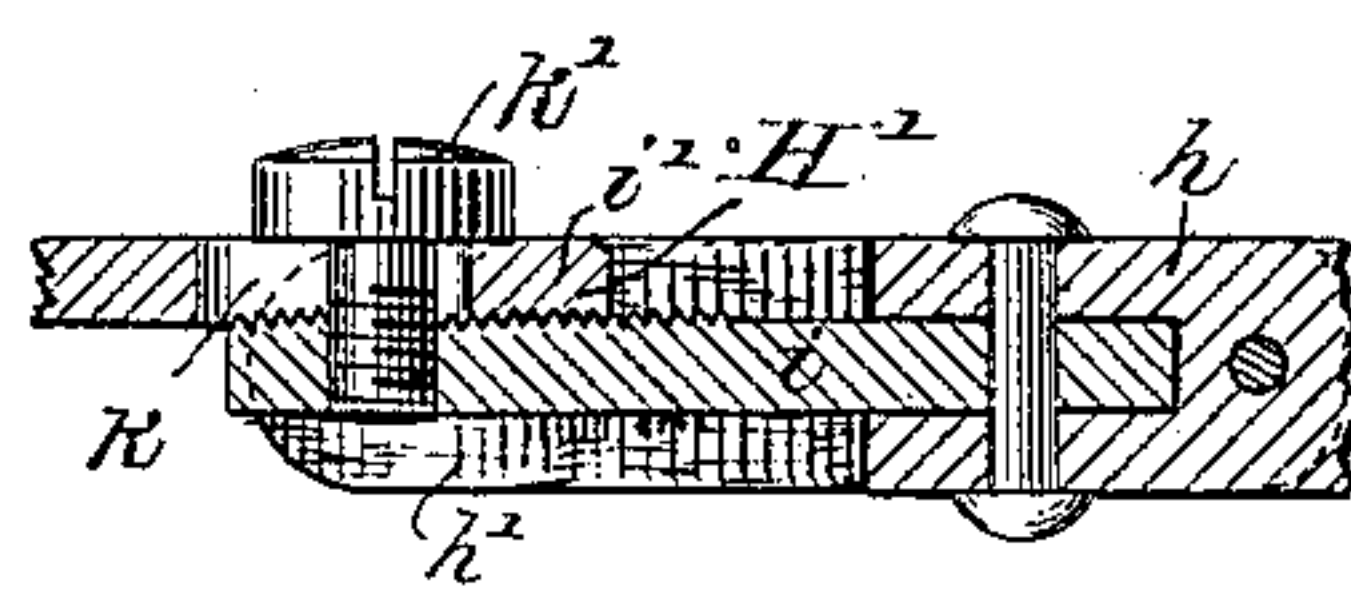


Fig. 7.



WITNESSES

Wm A. Skinkle
Geo. W. Young

INVENTOR

William R. Baker.

By his Attorneys

Panaman Ed Panamen

UNITED STATES PATENT OFFICE.

WILLIAM R. BAKER, OF CHICAGO, ILLINOIS, ASSIGNOR TO THE McCORMICK HARVESTING MACHINE COMPANY, OF SAME PLACE.

GRAIN-BINDER.

SPECIFICATION forming part of Letters Patent No. 357,140, dated February 1, 1887.

Application filed August 7, 1884. Serial No. 139,895. (No model.) Patented in England July 19, 1884, No. 10,330; in Victoria October 2, 1884, No. 3,854; in New Zealand November 20, 1884, No. 1,300; in South Australia February 2, 1885, No. 531, and in New South Wales February 3, 1885, No. 1,008.

To all whom it may concern:

Be it known that I, WILLIAM R. BAKER, of Chicago, in the county of Cook and State of Illinois, have invented certain new and useful
5 Improvements in Grain-Binders, of which the following is a specification.

My invention relates to the mechanism by which the end of the binding-cord is grasped and held when delivered by the binding-arm,
10 and, more particularly, the means for operating the now common rotary-disk holder. This is generally mounted in a swinging frame and so controlled that it is made to yield toward the knotter as slack is demanded in the tying
15 operation, but is forced away therefrom immediately after the knot is finished. This construction I have chosen as the preferable form for the embodiment of my invention, and to that end have introduced into it certain novel
20 features.

In the class of holders referred to the rotary disk by which the cord is grasped and forced against the clamping-shoe is intermittently
25 impelled at suitable intervals by means of a ratchet on said disk and a pawl engaging with said ratchet, which pawl is sometimes mounted on a bell-crank lever and in nearly all modern machines driven by means of a cam-track or
30 ledge in or upon the face of a gear and cam wheel mounted on the binder-shaft. Aside from the objectionably cumbrous nature of such apparatus and the relatively large amount of friction involved, it has been found that the rough usage to which they are subjected
35 in practice, the gritty dust from the field, and other causes, result in a rapid wearing away of the cam-track, the ratchet-teeth, the pawl, and the joints of the intermediate mechanism, so that after a little while the holder
40 fails to work properly, and the parts have to be replaced, or else an adjustable section has to be introduced into the cam-track at the point where the effective stroke of the pawl is to be given, which may be so adjusted as to
45 carry the point of the latter to the extreme limit of the proper stroke. Such a device, however, imparted to the pawl a longer reciprocation, and as the parts became worn or bent this reciprocation might be carried so

far in the reverse stroke as to cause it to pass 50 more than the proper number of ratchet-teeth.

In the present device the point or nose of the pawl itself is made adjustable as to its distance from the immediate actuating mechanism, either by constructing said pawl in sections, one movable longitudinally of the other,
55 or by suitably connecting it with its carrying arm or block, so that while the stroke remains always the same said point may be set nearer to or farther from the ratchet-tooth with which
60 it is to engage, as demanded by circumstances; and for the purpose of adapting such adjustable pawl to the above-mentioned swinging holder-frame, said frame is pivoted upon a revolving shaft intermittently turned by a gear
65 section on a wheel on the binder-shaft and held at rest in the intervals between its movements by a delay-surface on said wheel matching with a shoe upon the pivot-shaft pinion; and upon a wrist-pin from a short crank at
70 the outer end of this shaft is arranged a sleeve having a lateral arm or lug, to which arm the pawl is hinged with its free end properly guided near to the ratchet beneath the holder-disk, whereby the revolution of the wrist-pin
75 as the pivot-shaft turns reciprocates the pawl back and forth and brings it into engagement with the ratchet-teeth of the holder-disk, or causes it to ride over their backs to take a fresh grasp. The cam which controls the times of
80 rise and fall of the holder-frame is also, for convenience and compactness, placed or formed upon the side of the delay-wheel which drives the pinion of the pivot-shaft. Such features, combinations, and details of construction in
85 the foregoing structure as appertain to my invention will appear from the ensuing description and claims.

In the drawings, Figure 1 is a bottom plan view of a cord-holder and accessory mechanism 90 embodying my improvements. Fig. 2 is a side elevation thereof with the bracket-support and holder-frame partly in section and the knotter removed to more clearly expose the mechanism; Fig. 3, a like side elevation, with the
95 knotter in position and the holder-frame intact in a different position; Fig. 4, a transverse section through the holder-frame and support-

ing-bracket on the line indicated in Fig. 1 by like numerals; Fig. 5, a transverse section through the holder-frame on the correspondingly-numbered line in Fig. 1. Fig. 5^a is a similar section on a lower plane, as shown by line 5^a in Fig. 1; Fig. 6, a detail of the delay-gearing for imparting motion to the holder-shaft and ultimately to the holder-disk; Fig. 7, a sectional detail of the pawl-pitman employed to move said holder-disk.

A is the binder-shaft which, in the modern McCormick cord-binder, overhangs the grain-receptacle and is driven by a gear and cam wheel at the front thereof. B is a portion of the supporting-bracket or bracket-casting and rear bearing of this shaft, and C is one of the ejector or discharge fingers commonly mounted upon and turned by said shaft. These parts will not necessarily differ from those now in use; neither is it essential to my invention that they should identically correspond therewith.

At the rear end of the binder-shaft, inside of the ejector-finger, is a wheel, D, having a peripheral section of gear-teeth, d , and a delay-track, d' , and also upon its face a cam-ledge, d'' , of practically the outline and relative position shown, for the purpose hereinafter stated. Supported in a bearing or bearings in the bracket-casting opposite the lower inner quadrant of the wheel is a short shaft, E, provided with a pinion, e , and a delay-shoe, e' , which pinion meshes with and is of such size as to be given one revolution by the gear-section, while its delay-shoe locks with the delay-track on said wheel in the intervals between the revolutions and prevents motion. The end of the shaft away from the pinion, and about the center of the holder-frame, is cranked and has a wrist-pin, e'' , whereby motion is to be immediately communicated to the holder-disk. This short shaft, which I will hereinafter call the "holder-shaft," in distinction to the binder-shaft, affords one of the journals, f , for the holder-frame f' , the other journal, f'' , being located upon the bracket-casting in axial alignment with the axis of the shaft.

A heel projection, f''' , rises from the holder-frame alongside of the wheel on the binder-shaft, and a roller, f''' , from this projection bears against the above-mentioned cam track or ledge d'' on the face of said wheel, whereby the frame will be pressed down and held down for the proper interval, and then allowed to rise to yield slack in the binding operation, pivoting in this movement upon the axis of the holder-shaft, which can therefore actuate its mechanism irrespective of the displacement.

In the usual position on the holder-frame is journaled the notched holder-disk G, held against retrogression by the click g , and saddled at one side by the spring-pressed clamping-shoe g' , such as has heretofore been known. A ratchet-wheel, g'' , is secured beneath the holder-disk, as usual, whereby it is to be driven.

Upon the wrist-pin is loosely mounted a block or sleeve, H, having a lateral arm or lug, h , to the end of which the heel of the pawl or dog H' is pivoted. A spring, h' , is riveted or otherwise secured to the lateral arm or to the sleeve in position to press at its free end against the back of the dog and force it toward the ratchet beneath the holder-disk, and said dog is guided and prevented from circling about the wrist-pin on one side by means of a smooth or planed way, h'' , upon the frame-arm, which extends beneath and supports the disk and ratchet, and on the other either by the overcrowning disk or by the click, which is so arranged as to bridge or saddle it. Undue pivotal delay is also guarded against in one direction by the lug h''' rising from the frame-arm behind the dog, and in the other, of course, by the ratchet. The point of the dog is preferably hooked, so as to catch into and pull upon the ratchet as it is drawn back by the revolution of the wrist-pin; but the ordinary push-dog may be employed, provided it is arranged to act upon the reverse side of the ratchet-disk and a corresponding change of time made in the movement of the crank.

In order to take up or compensate for wear, either the arm to which the dog is pivoted will be made in two sections, one adjustable lengthwise of the other, or else the dog itself will be bimembral and extensible. The latter is the most convenient resort, and accordingly is chosen for illustration, i being the heel-section, pivoted to the arm, and at its other end ribbed or serrated on one face, and i' the nose-section, correspondingly ribbed or serrated on the surface intended to come in contact with the roughened end of the heel-section, the connection between the two being made by a slot, k , and clamping bolt or screw k' , the former of which is shown as formed through the heel-section, but may be in either section. This construction is sufficient to permit any reasonable range of adjustment. Other adjusting devices may be employed; but for the present construction the one described is the simplest and most durable.

For practical use the gear-section and delay-surface on the periphery of the wheel upon the binder-shaft and the cam upon its face will be relatively so arranged and timed with reference to each other, and to the parts which they immediately actuate, that in the operation of the device the holder-disk will move to clamp or grasp the second end of the band, having previously grasped the first before the knoter commences its revolution, and consequently before any slack is demanded and while the holder-frame is stationary; but this clamping of the second end, or, in other words, the stopping of the disk, may not be entirely complete until the knoter has nearly or quite finished its movement. The holder-frame, which until the proper moment is held down by the circular or concentric peripheral reach of the cam acting upon its heel-exten-

sion, will be released by the attaining of the cut-away portion at the time the knotter begins its revolution, and allowed to rise either by the stress of the cord in opposition to its own gravity as slack is required, or else at a rate determined by the outline of the cam at this point; but in the instances shown its gravity alone will, within suitable limits, be opposed to the cord.

10 I claim as my invention—

1. The combination, substantially as here-
inbefore set forth, of a swinging holder-frame,
a revolving shaft with the axis of which its
pivot coincides, a pinion and delay-shoe upon
15 said shaft, an arm carried back and forth by a
crank on the shaft as it revolves, a holder-disk
having ratchet-teeth, a dog pivoted upon the
arm and taking into the ratchet to move the
disk as the bar reciprocates, a wheel having a
20 gear-section engaging with the pinion on the
holder-shaft, and a delay track or surface to
engage with its delay-shoe, so proportioned as
to give the shaft a single revolution and lock
it at rest, and means whereby the holder-frame
25 is controlled in position and permitted to yield
toward the knotter as slack is demanded.

2. The combination, substantially as here-
inbefore set forth, of the swinging holder-frame,
the revolving holder-shaft upon which it is
30 pivoted, a pinion, delay-shoe, and wrist-pin
upon said shaft, the binder-shaft and wheel
thereupon having a gear-section to turn the
pinion upon the holder-shaft, a delay-track to
lock with its delay-shoe, and a cam engaging

with a roller upon the rear end of the holder- 35
frame to control the movements of the latter
toward and from the knotter, the reciprocating
arm or pitman connected with the wrist-
pin to be moved by the revolution of the holder-
shaft, an adjustable dog carried by said arm, 40
guides on the holder-frame whereby said arm
and dog are directed, a holder-disk, and a
ratchet thereon with which the dog engages.

3. The combination, substantially as here-
inbefore set forth, of the holder-frame, the in- 45
termittently-revolving holder-shaft having
crank and wrist-pin, the sleeve and arm borne
and actuated by said wrist-pin, the pawl made
in two sections, one of which is adjustable
lengthwise of the other, the holder-disk and 50
its shoe, and the ratchet attached to said disk.

4. The combination, substantially as here-
inbefore set forth, of the holder-frame, the in-
termittently-revolving holder-shaft having
crank and wrist-pin, the sleeve and arm borne 55
and actuated by said wrist-pin, the pawl made
in two sections, one of which is adjustable
lengthwise of the other, the holder-disk over-
crowning the nose of said pawl, the ratchet
attached to said disk, the rest or guide for the 60
pawl formed upon the holder-frame, the stop
which checks its movement away from the
pawl, and the click attached to said stop and
confining the pawl.

WILLIAM R. BAKER.

Witnesses:

JOHN V. A. HASBROOK,
PAUL ARNOLD.