

No. 735,847.

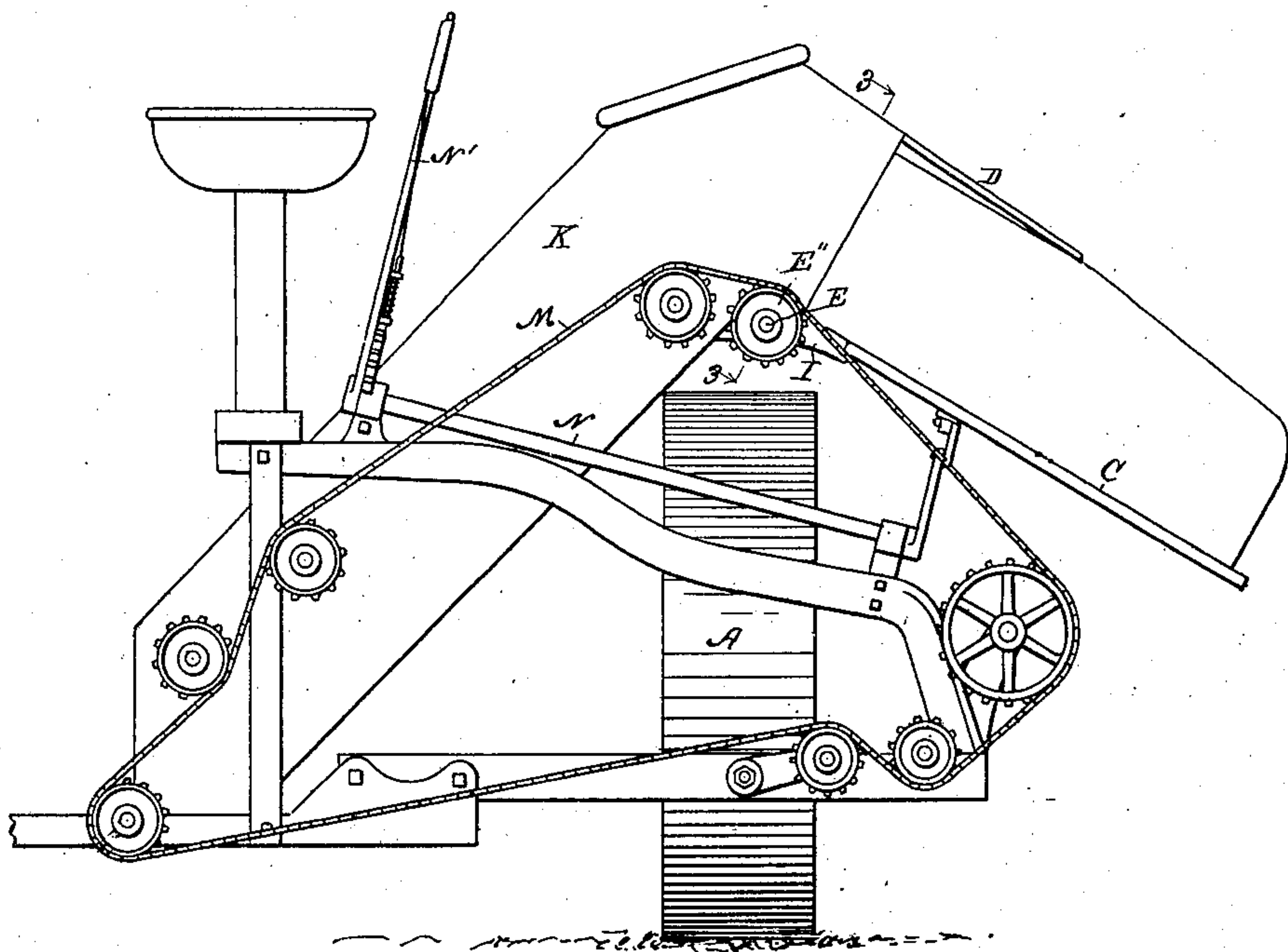
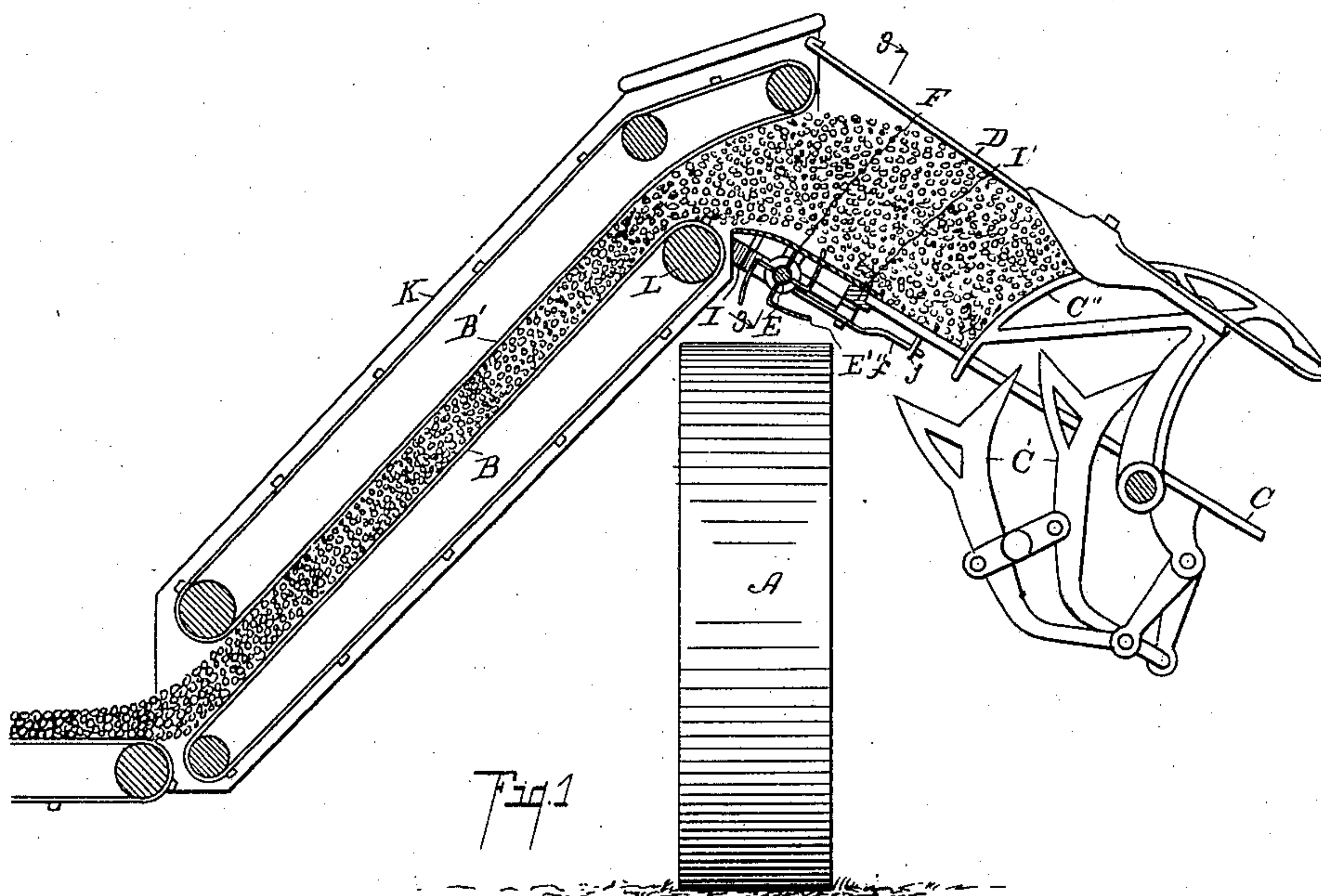
PATENTED AUG. 11, 1903.

W. C. WALKER.  
BINDER.

APPLICATION FILED FEB. 15, 1902.

NO MODEL.

3 SHEETS—SHEET 1.



Witnesses:

*D. E. Wood.*

*Otis W. Earl*

Inventor,

*Ward C. Walker*

By *Fred L. Chappell*

Att'y.

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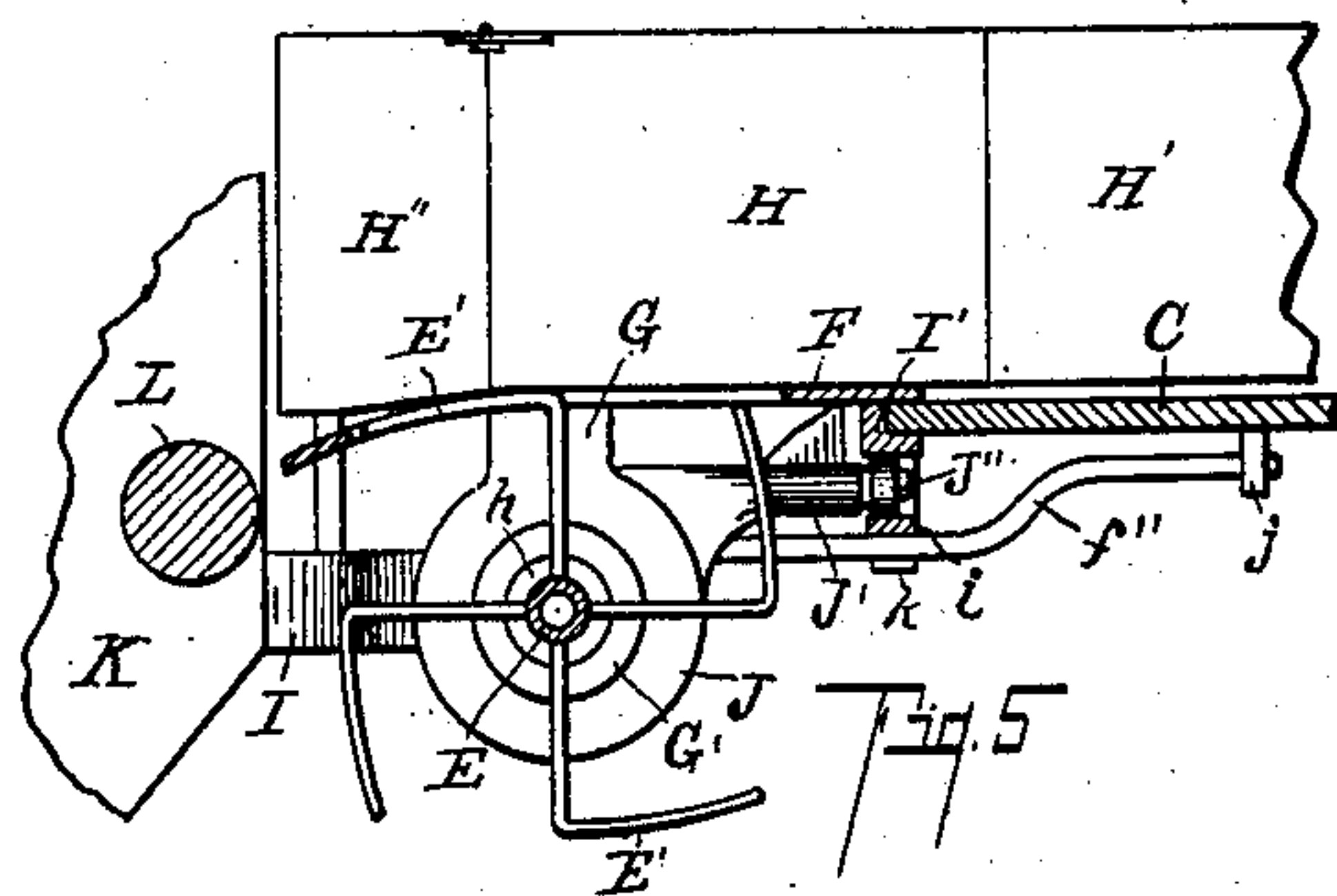
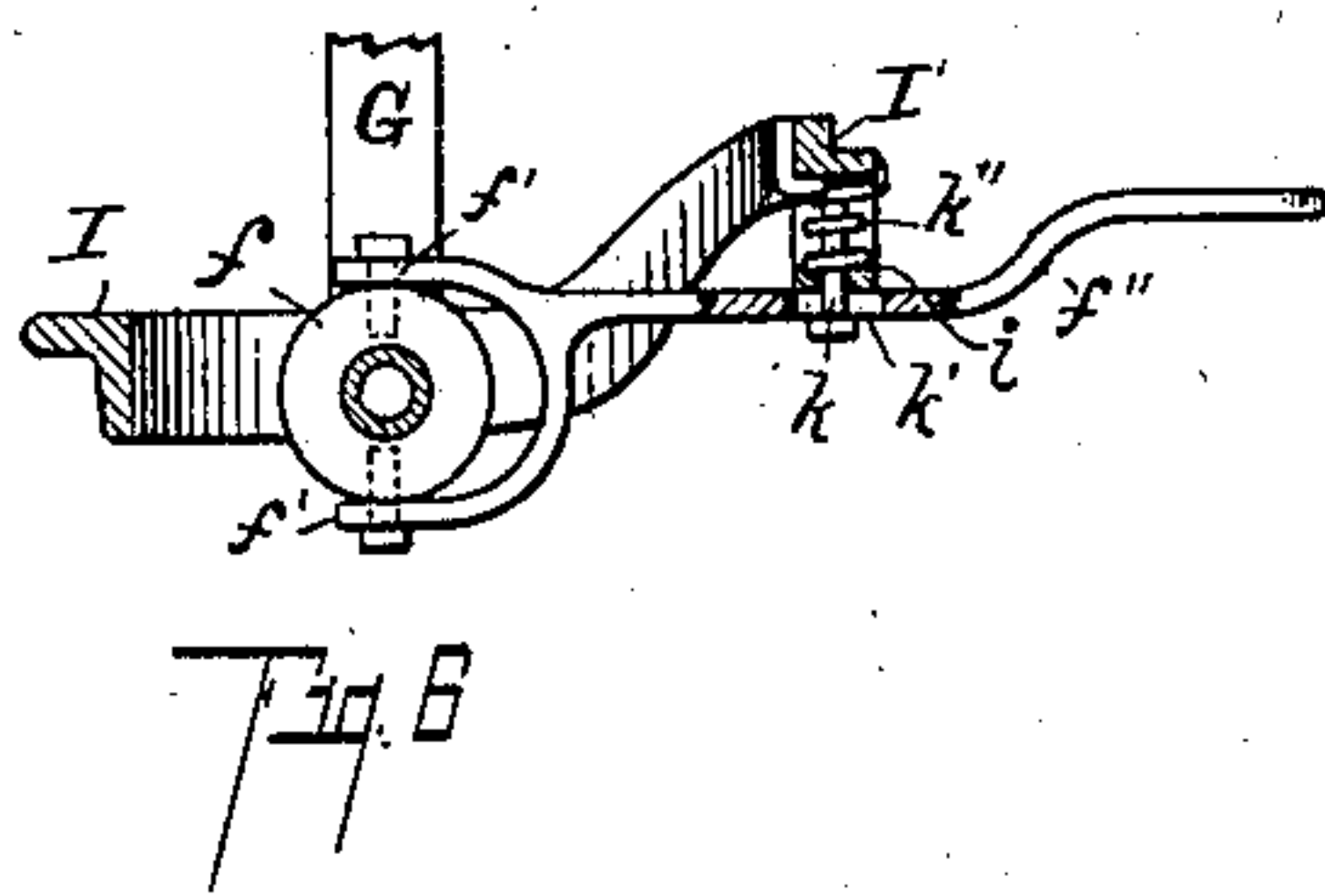
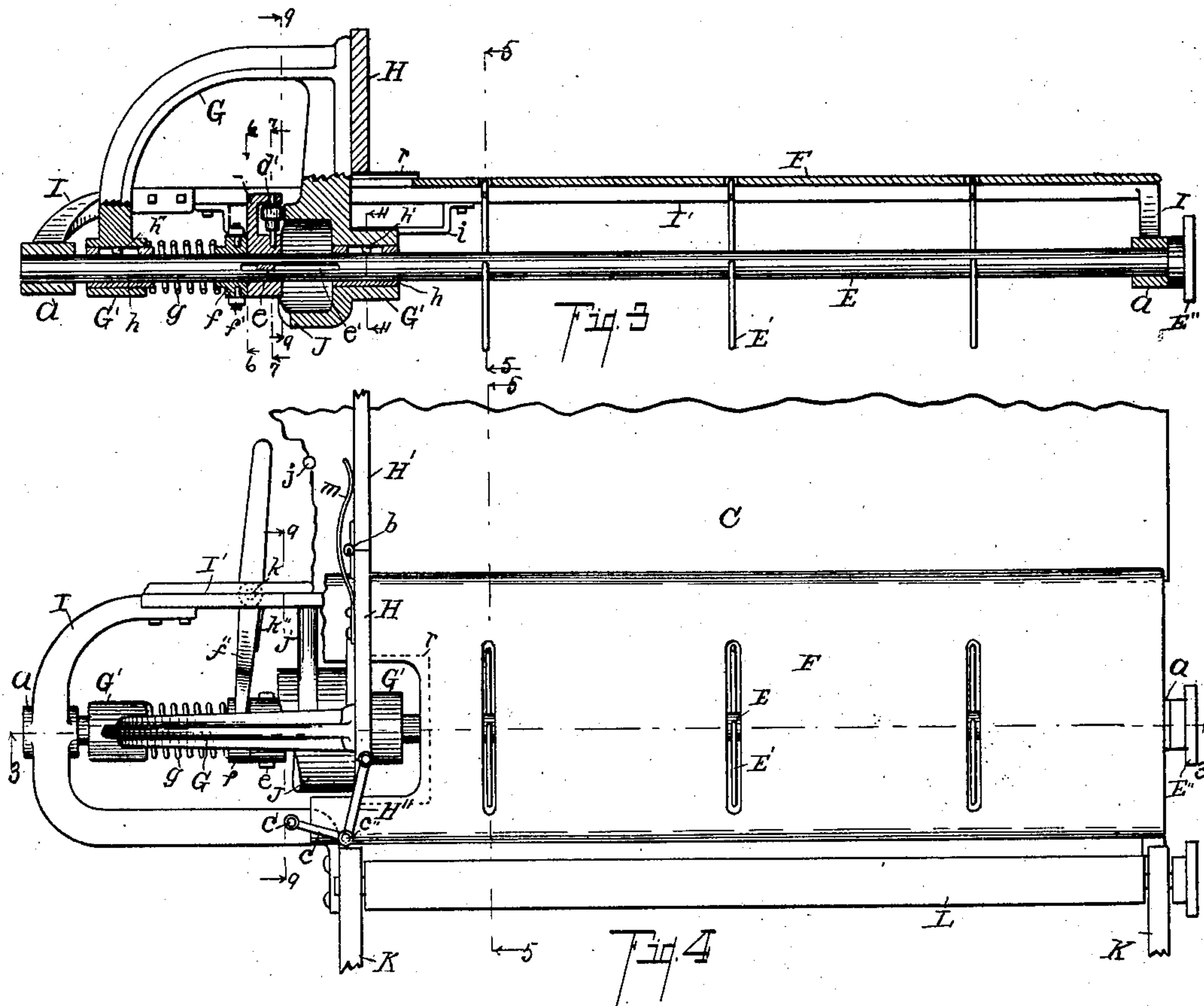
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3 SHEETS—SHEET 2.



Witnesses:

*DeWard*  
*Otto W. Earl*

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*Ward C. Walker*  
By *Fred L. Chappell*  
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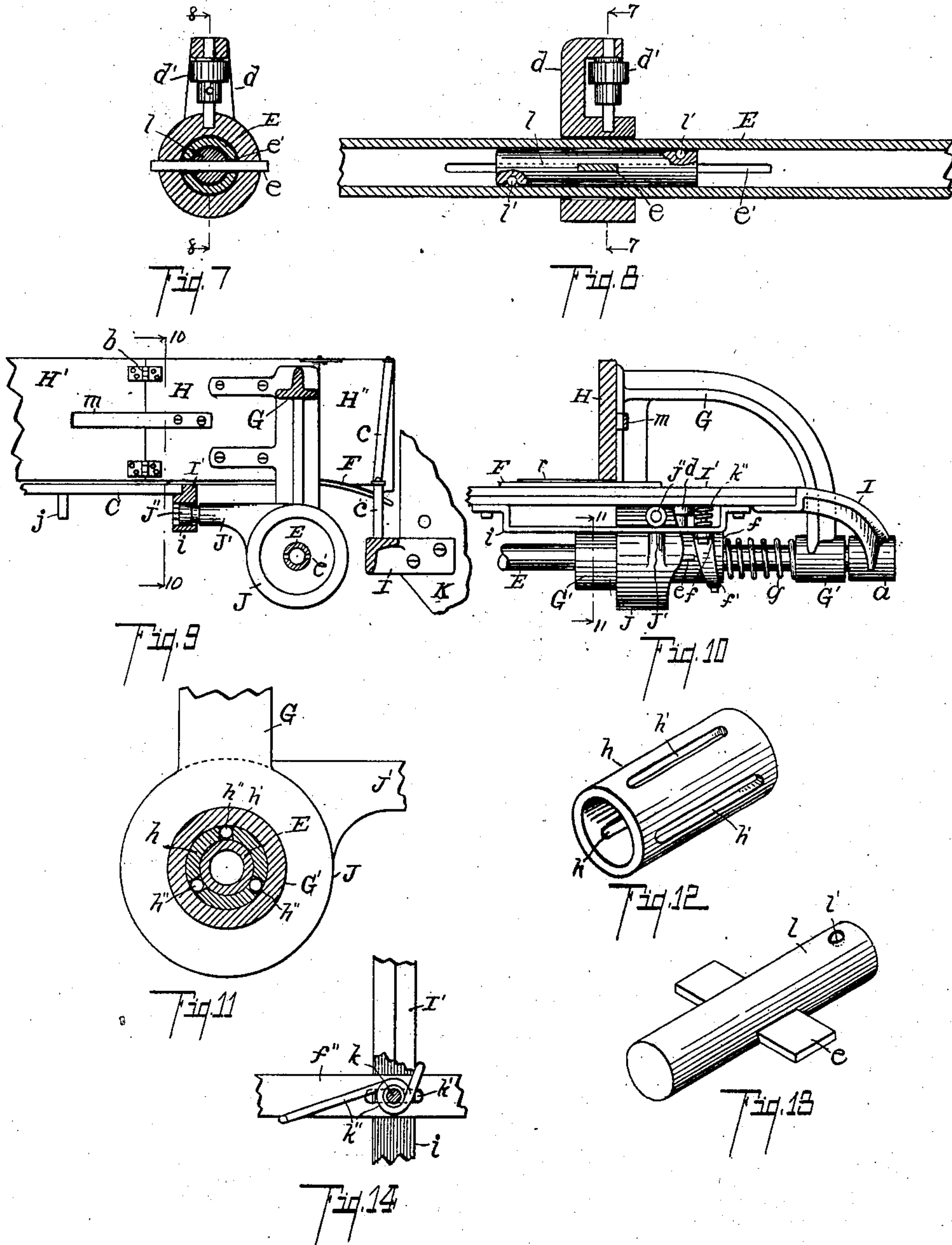
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NO MODEL.

3 SHEETS—SHEET 3.



Witnesses:

*D. E. Wood,*  
*Otis A. East*

Inventor,

*W. C. Walker*  
By *Frederick L. Chappell*  
Att. v.



# UNITED STATES PATENT OFFICE.

WARD C. WALKER, OF BATTLECREEK, MICHIGAN.

## BINDER.

SPECIFICATION forming part of Letters Patent No. 735,847, dated August 11, 1903.

Application filed February 15, 1902. Serial No. 94,295. (No model.)

*To all whom it may concern:*

Be it known that I, WARD C. WALKER, a citizen of the United States, residing at the city of Battlecreek, in the county of Calhoun and State of Michigan, have invented certain new and useful Improvements in Binders, of which the following is a specification.

This invention relates to improvements in self-binders.

The invention relates particularly to the grain adjusting and carrying means.

As heretofore constructed a serious defect in self-binding harvesters has been the clogging of the grain or the leakage of the grain at the upper ends of the elevating aprons or canvases which carry the grain from the lower platform to the binding-deck above. The space between the aprons and deck is the point of deficiency. Another serious matter in this connection has been that there was no efficient adjusting means and no efficient butter-board to keep the grain perfectly straight and true to deliver it properly to the binding mechanism. Heretofore adjustment of butter-boards and of the decking generally has been accomplished by the manipulation of two or more levers, and when adjusted the different parts are thrown out of true and there is practically but one position in which such old devices will be successfully operative. That the butter-board may operate effectively the grain must be advanced evenly, and the butter-board should be adjusted without losing its proper angle to the decking over which the grain passes.

It is the object of my invention, therefore, to provide an efficient means of carrying the grain forward from the elevating aprons or canvases and delivering it properly to the binding mechanism in a perfectly true form for the bundle.

A further object is to provide a butter-board mechanism which is easily adjustable in connection with the decking without losing its proper angle with relation to the grain.

A further object is to provide, in connection with such a butter-board, a means for advancing the grain properly on the binding-deck, so that it will be kept even at the base and the straw parallel.

Further objects relate to the details of construction whereby the operation and the manipulation of the parts are facilitated.

I accomplish the objects of my invention by the devices and means described in this specification.

The invention is clearly defined, and pointed out in the claims.

A structure embodying the features of my invention is fully illustrated in the accompanying drawings, forming a part of this specification, in which—

Figure 1 is a detail end sectional elevation of parts of a harvesting-machine looking forward, indicating the relative position and location of the various parts of my improved device in the harvester. Fig. 2 is a similar rear elevation view with the general casings added, indicating the relation of the operating-lever, seat, and driving means. Fig. 3 is an enlarged detail sectional view taken on a line corresponding to lines 3 3 of Figs. 1, 2, and 4. Fig. 4 is an enlarged detail plan view of the butter and the carrying means for the grain illustrated in Fig. 3. Fig. 5 is a detail transverse sectional view through the same, taken on a line corresponding to lines 5 5 of Figs. 3 and 4. Fig. 6 is a detail sectional view taken on a line corresponding to line 6 6 of Fig. 3. Fig. 7 is an enlarged detail transverse sectional view taken on a line corresponding to lines 7 7 of Figs. 3 and 8. Fig. 8 is an enlarged detail sectional view taken on a line corresponding to line 8 8 of Fig. 7. Fig. 9 is an enlarged detail sectional view taken on lines 9 9 of Figs. 3 and 4. Fig. 10 is an enlarged detail sectional view taken on line 10 10 of Fig. 9. Fig. 11 is an enlarged detail sectional view on line 11 11 of Fig. 10. Fig. 12 is a detail perspective view of the bushing for the bearings of the butter-board mechanism. Fig. 13 is a detail perspective view of the part 1, through which the collar-like cam acts in operating the butter-board. Fig. 14 is an enlarged detail view of the lever with its spring connections for automatically returning the butter-board to the normal position when the binder-decking is shifted toward the rear of the machine.

In the drawings all of the sectional views are taken looking in the direction of the little arrows at the ends of the section-lines,



and similar letters of reference refer to similar parts throughout the several views.

Referring to the lettered parts of the drawings, A is a driving-wheel, represented in conventional form.

B B' are elevating aprons or canvases carried on suitable rollers in a casing K for the elevation of the grain to the binding-deck.

L is the upper roller of the under apron.

10 A strip of stationary decking F, having transverse slots through the same, is placed quite close to the roller L. This strip of decking F overlaps the movable binder-decking C, so that the grain passing over the decking F is  
15 delivered upon the same to the packer-fingers C'.

C' is the needle of the binding mechanism, shown in conventional form, and D is a cover or shield above the binder-deck.

20 Beneath the decking F is a shaft E, carried in suitable boxes *a a* at each end, and on the rear of the same is a sprocket-wheel E'' or other suitable driving means connected with the other moving parts of the machine. The sprocket-wheel E'' is preferred,  
25 because it will then be only necessary to extend the sprocket-chain, as M, over the sprocket-wheel to properly drive it, as appears in Fig. 2. Transverse fingers E' are  
30 provided on the shaft E, which extend outwardly and are then bent off at an angle and slightly curved, so that in operation the outer portions of the arms will strike up through transverse slots in stationary decking F and carry the grain forward and will  
35 then be withdrawn from contact with the grain substantially at right angles. This particular form of fingers is adapted to prevent any clogging of the grain at this point  
40 by drawing the same through the slots in the decking.

The decking C, along with the packing and knoter mechanism, is made adjustable back and forth in any of the well-known ways  
45 now made use of in binders of this class for the purpose of shifting the knoter mechanism along the bundle as may be desirable for the varying lengths of grain.

The butter-board mechanism is operated  
50 and adjusted as will be hereinafter described. It is adjustable back and forth by means of a lever *f''*, which is acted upon by a pin *j* on the under side of the adjustable deck C, which is made to strike this lever *f''*  
55 and carry the butter-board toward the rear when the knoter mechanism is carried toward the front. This distinctly appears in Figs. 1 and 5. The lever and its connections to adjust the butter-board mechanism  
60 will be hereinafter completely described.

On the shaft E, which is fixed from longitudinal movement, is the butter-board mechanism, the same being adapted to reciprocate longitudinally on the shaft. This longitudinal movement is accomplished by boxes  
65 or bearings G' G' on the bracket G, which carries the butter-board H. These brackets

contain bushings, (illustrated at *k*.) A loose collar *f* embraces the shaft E just back of the bracket *d* and is controlled by the forked lever *f''*, which is pivoted at *k* and is acted upon  
70 by the pin *j*, heretofore referred to, when the binder mechanism and butter-board are shifted for the proper adjustment for short grain. A spring *g* holds this collar against  
75 the bracket *d* and also holds the bracket G under tension, and by this means when the shaft E is rotated the butter-board H will be reciprocated back and forth, striking against the butt-ends of the grain to even up the same  
80 as it is delivered to the packers C' by the carrying-fingers E', as will clearly appear from the detailed description of parts to follow. The lever *f''* is supported by a pin *k* on the beam I'. The lever is slotted at *k* to permit  
85 the required movement as the butter-board is shifted and is acted upon by the spring *k''*, which surrounds the pivot *k* and is connected to the lever *f''* and to the beam I', which throws the free end of the lever normally toward the rear of the machine and holds the  
90 butter-board normally toward the front of the machine. When the lever *f''* is moved by the pin *j* contacting therewith, it will carry and hold the butter-board normally toward  
95 the rear of the machine without in any way varying its reciprocatory motion. It will be seen from this that when the binder is adjusted back and forth by means of the lever  
100 N' with rock-shaft connection N the butter-board is automatically adjusted in relation thereto to secure the best results. The pin *j* is so located on the deck C that it may be moved forward a short distance before engaging the lever *f''* to shift the butter-board,  
105 so that the butter-board is shifted for very short grain only.

The butter-board is made up of a central part rigidly connected to the bracket G. To the edge of this I hang a guide or wing H'',  
110 the free end of which is supported by a link *c*, which is pivotally connected to the guide at *c''* and to the bracket or frame I at *c'*, so that the grain will be forced down the decking and guided into position to be acted upon by  
115 the butter-board. A section H' is hinged at *b* and is held normally in line with the central part by means of the spring *m*. This hinged portion is provided as a guide for the grain as it is carried forward after being  
120 properly adjusted and is made yielding, so that it will not prevent the adjustment of the decking C while there is a bundle on the same.

The boxes G' are provided with bushings  
125 (illustrated at Fig. 12) containing longitudinal slots *h'* at intervals around the same in which are placed bearing-balls *h''*, which enable the structure to reciprocate readily back and forth on the shaft E, upon which it is supported.  
130

Supported upon an arm J', projecting from the casting J, is a guide-roller J'', adapted to reciprocate in suitable guides *i* on the under



side of the stationary decking F and keep the butter-board in proper relation to the decking. The casting J embraces the shaft E like a collar and has a cam on the side toward the front of the machine, as clearly appears in Figs. 3, 4, and 10. This casting J is secured to or is a part of the bracket G, which carries the butter-board. A shield *r* projects from the bottom of the butter-board over the stationary decking F, which is cut away at this point to permit the reciprocation of the butter-board mechanism.

The front end of the shaft E is hollow and contains a longitudinal slot *e'*. (See Figs. 3 and 8.) Within this hollow shaft is a plug or plunger *l*, having bearing-balls *l'* toward each end, as clearly appears in Fig. 8, the same being positioned to counteract the strain and permit the plunger *l* to reciprocate freely. Through the plunger *l* is a key *e*, which engages the bracket *d*; which has a collar embracing the shaft E, so that the bracket will be rotated with the shaft. This bracket carries an antifriction-roller *d'*, which is adapted to engage the cam-face on the bracket G, and the bracket is held to the same by the spring *g*, so that the bracket G, which carries the butter-board, will reciprocate back and forth by the rotation of the shaft E.

In operating my improved binder the grain is carried up the elevator-canvases in the usual way, when it is engaged by the fingers E' on the shaft E and carried forward across the stationary decking F, where it is engaged by the packers C'. As these fingers E' are shaped to withdraw at right angles through the decking F, there is no possibility of their entangling straw and clogging at this point. The fingers E' engage the straw practically as soon as it leaves the apron, so that it cannot be drawn down by the apron. The butter-board is on this same shaft and evens the butts as they are carried along in this way and forced down to the packers of the binder mechanism. In an ordinary length of grain no adjustment is necessary. When the grain is very short, by operating the lever N' the binder mechanism is carried toward the butts—that is, toward the butts of the bundle—and the butter-board is carried in the opposite direction and delivers the grain properly to the binder even though it is extremely short.

I have shown the details of my device fully because I consider that they are in the form best adapted to the purpose intended; but I am aware that many of the devices I have in lessening friction and securing superior operation might be dispensed with and still have the device fairly successful in operation.

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

1. In a binder, the combination of the elevating aprons or canvases; a stationary decking F having transverse slots therein arranged

adjacent to the top roller of the lower elevating-canvas; a shaft E beneath said decking, with connections for revolving the same; fingers on said shaft; a bracket G with a suitable bearing on said shaft toward the forward end of the machine; a collar-like cam carried by said bracket; a butter-board consisting of a central section rigidly secured to said bracket; a section H' hinged to the lower part thereof and held yieldingly in position by a spring *m*, and a guide-section H'' pivotally secured to the upper part of the section H; a bracket-like collar *d* carried by said shaft and having a roller to act upon the face of said cam; a spring for holding the cam normally against the same; a collar on said shaft to contact with said bracket *d*; an adjusting-lever *f''* for adjusting said collar; a spring to return said lever to its initial position; a movable decking C carrying the knotter mechanism adapted to engage and operate said lever *f''* toward the end of its forward movement; and means for controlling said last-named decking, all coacting for the purpose specified.

2. In a binder, the combination of the elevating aprons or canvases; a stationary decking F having transverse slots therein, arranged adjacent to the top roller of the lower elevating-canvas; a shaft E beneath said decking with connections for revolving the same; fingers on said shaft; a bracket G with a suitable bearing on said shaft, toward the forward end of the machine; a collar-like cam carried by said bracket; a butter-board on said bracket; a bracket-like collar *d* carried by said shaft and having a roller to act upon the face of said cam; a spring for holding the cam against the same; a collar on said shaft to contact with said bracket *d*; an adjusting-lever *f''* for adjusting said collar; a spring to return said lever to its initial position; a movable decking C carrying the knotter mechanism adapted to engage and operate said lever *f''* toward the end of its forward movement; and means for controlling said last-named decking, all coacting for the purpose specified.

3. In a binder, the combination of the elevating aprons or canvases; a stationary decking F having transverse slots therein, arranged adjacent to the top roller of the lower elevating-canvas; a shaft E beneath said decking with connections for revolving the same; fingers on said shaft; a bracket G with a suitable bearing on said shaft toward the forward end of the machine; a collar-like cam carried by said bracket; a butter-board consisting of a central section rigidly secured to said bracket; a section H' hinged to the lower part thereof and held yieldingly in position by a spring *m*, and a guide-section H'' pivotally secured to the upper part of the section H; a bracket-like collar *d* carried by said shaft having a roller to act upon the face of said cam; a spring for holding the cam against the same; a collar on said shaft to contact



with said bracket *d*; and an adjusting-lever *f''* for adjusting said collar, all coacting for the purpose specified.

4. In a binder, the combination of the elevating aprons or canvases; a stationary decking *F* having transverse slots therein, arranged adjacent to the top roller of the lower elevating-canvas; a shaft *E* beneath said decking with connections for revolving the same; fingers on said shaft; a bracket *G* with suitable bearings on said shaft toward the forward end of the machine; a collar-like cam carried by said bracket; a butter-board carried by said bracket; a bracket-like collar *d* carried by said shaft having a roller to act upon the face of said cam; a spring for holding the cam normally against the same; a collar on said shaft to contact with said bracket *d*; and an adjusting-lever *f''* for adjusting said collar, all coacting for the purpose specified.

5. In a binder, the combination of suitable elevating-canvases; a stationary decking *F* having slots therein arranged adjacent to the top roller of the lower elevating-canvas; a shaft arranged beneath said decking having suitable operating connections, and having fingers adapted to pass through said slots as the shaft revolves, and engage the grain as it is delivered by said elevating-canvases and carry it forward; a butter-board arranged toward the front of said machine; means carried by said shaft for imparting a reciprocatory motion to said butter-board; an adjustable decking carrying the knotter mechanism; connections for adjusting the adjustable decking; connections between said adjustable decking and said butter-board mechanism, whereby, when said decking is adjusted, the butter-board mechanism will be carried in an opposite direction, for the purpose specified.

6. In a binder, the combination of suitable elevating-canvases; a stationary decking having slots therein, arranged adjacent to the top roller of the lower elevating-canvas; a shaft arranged beneath said decking having suitable operating connections and having fingers adapted to pass through said slots as the shaft revolves and engage the grain as it is delivered by said elevating-canvases and carry it forward to the packing-fingers of the binder mechanism; a butter-board arranged toward the front of said machine; an adjustable decking carrying the binding mechanism; connections for adjusting said adjustable decking; connections between said adjustable decking and said butter-board mechanism, whereby, when said decking is adjusted, the butter-board mechanism will be carried in an opposite direction, for the purpose specified.

7. In a binder, the combination of a suitable binding mechanism having suitable packing-fingers; elevating-canvases; a stationary decking having slots therein arranged

above said binding mechanism and adjacent to the top roller of the lower elevating-canvas; a shaft arranged beneath said decking having fingers thereon, said fingers extending radially outward and then tangentially rearward, whereby the last-named portions of said fingers are adapted to pass through said slots as the shaft is revolved, to engage the grain as it is delivered by said elevating-canvases and carry it forward to the packing-fingers; and a suitable butter-board arranged to act on the grain as it is carried forward by the fingers on said shaft, substantially as described.

8. In a binder, the combination of a suitable binding mechanism having suitable packing-fingers; elevating-canvases; a stationary decking having slots therein arranged above said binding mechanism and adjacent to the top roller of the lower elevating-canvas; a shaft arranged beneath said decking having fingers thereon, said fingers extending radially outward and then tangentially rearward, whereby the last-named portions of said fingers are adapted to pass through said slots as the shaft is revolved, to engage the grain as it is delivered by said elevating-canvases and carry it forward to the packing-fingers, substantially as described.

9. In a binder, the combination of suitable elevating-canvases; a shaft; means on said shaft for engaging the grain and carrying it forward as it is delivered from said canvases; a bracket *G* with suitable bearings on said shaft toward the forward end of the machine; a butter-board consisting of a central section rigidly secured to said bracket; a section *H'* hinged to the said central section and held yieldingly in position by a suitable spring, and a guiding-section pivotally secured to the said central section; a collar-like cam carried by said bracket; a bracket-like collar *d* on said shaft having a roller to act on the face of the said cam; a spring for holding the cam normally against said roller; a collar on said shaft to contact with said bracket *d*; an adjusting-lever *f''* for adjusting said collar; a spring to return said lever to its initial position; a movable decking carrying the knotter mechanism, adapted to engage and operate said lever *f''*; means for controlling said decking; all coacting for the purpose specified.

10. In a binder, the combination of suitable elevating-canvases; a shaft having means thereon for engaging the grain and carrying it forward as it is delivered from said canvases; a bracket *G* with suitable bearings on said shaft toward the forward end of the machine; a butter-board on said bracket; a collar-like cam carried by said bracket; a bracket-like collar *d* on said shaft having a roller to act on the face of said cam; a spring for holding the cam normally against said roller; a collar on said shaft to contact with said bracket *d*; an adjusting-lever *f''* for adjusting said collar; a movable decking carrying the knotter



mechanism adapted to engage and operate said lever *f''*; means for controlling said deck-  
ing, all coacting for the purpose specified.

11. In a binder, the combination of suitable  
5 elevating - canvases; a shaft having means  
thereon for engaging the grain and carrying  
it forward as it is delivered from said can-  
vases; a bracket G with suitable bearings on  
said shaft toward the forward end of the ma-  
10 chine; a butter-board consisting of a central  
section rigidly secured to said bracket; a sec-  
tion H' hinged to the said central section and  
held yieldingly in position by a suitable  
spring; and a guiding-section pivotally se-  
15 cured to the said central section; a collar-like  
cam carried by said bracket; a bracket-like  
collar *d* on said shaft adapted to act on the  
face of said cam; an adjustable collar on said  
shaft to contact with said bracket *d*; and  
20 means for adjusting said collar; all coacting  
for the purpose specified.

12. In a binder, the combination of suitable  
elevating - canvases; a shaft having means  
thereon for engaging the grain and carrying  
25 it forward as it is delivered from said can-  
vases; a bracket G with suitable bearings on  
said shaft toward the forward end of the ma-

chine; a butter-board on said bracket; a col-  
lar-like cam carried by said bracket; a bracket-  
like collar *d* on said shaft adapted to act on 30  
the face of said cam; a spring for holding the  
cam normally against said bracket; an ad-  
justable collar on said shaft to contact with  
said bracket *d*; and means for adjusting said  
collar, all coacting for the purpose specified. 35

13. In a binder, the combination of a shaft;  
a bracket G with suitable bearings on said  
shaft toward the forward end of the machine;  
a butter-board on said bracket; a collar-like  
cam carried by said bracket; a bracket-like 40  
collar *d* adjustably secured to said shaft  
adapted to act on the face of said cam; a spring  
for holding the cam normally against said  
bracket; an adjustable collar on said shaft to  
contact with said bracket *d*; and means for 45  
adjusting said collar, all coacting for the pur-  
pose specified.

In witness whereof I have hereunto set my  
hand and seal in the presence of two wit-  
nesses.

WARD C. WALKER. [L. S.]

Witnesses:

W. T. REMINGTON,  
FRED THOMAS.