

(No Model.)

3 Sheets—Sheet 1.

G. SCHUBERT.  
GRAIN BINDER.

No. 472,143.

Patented Apr. 5, 1892.

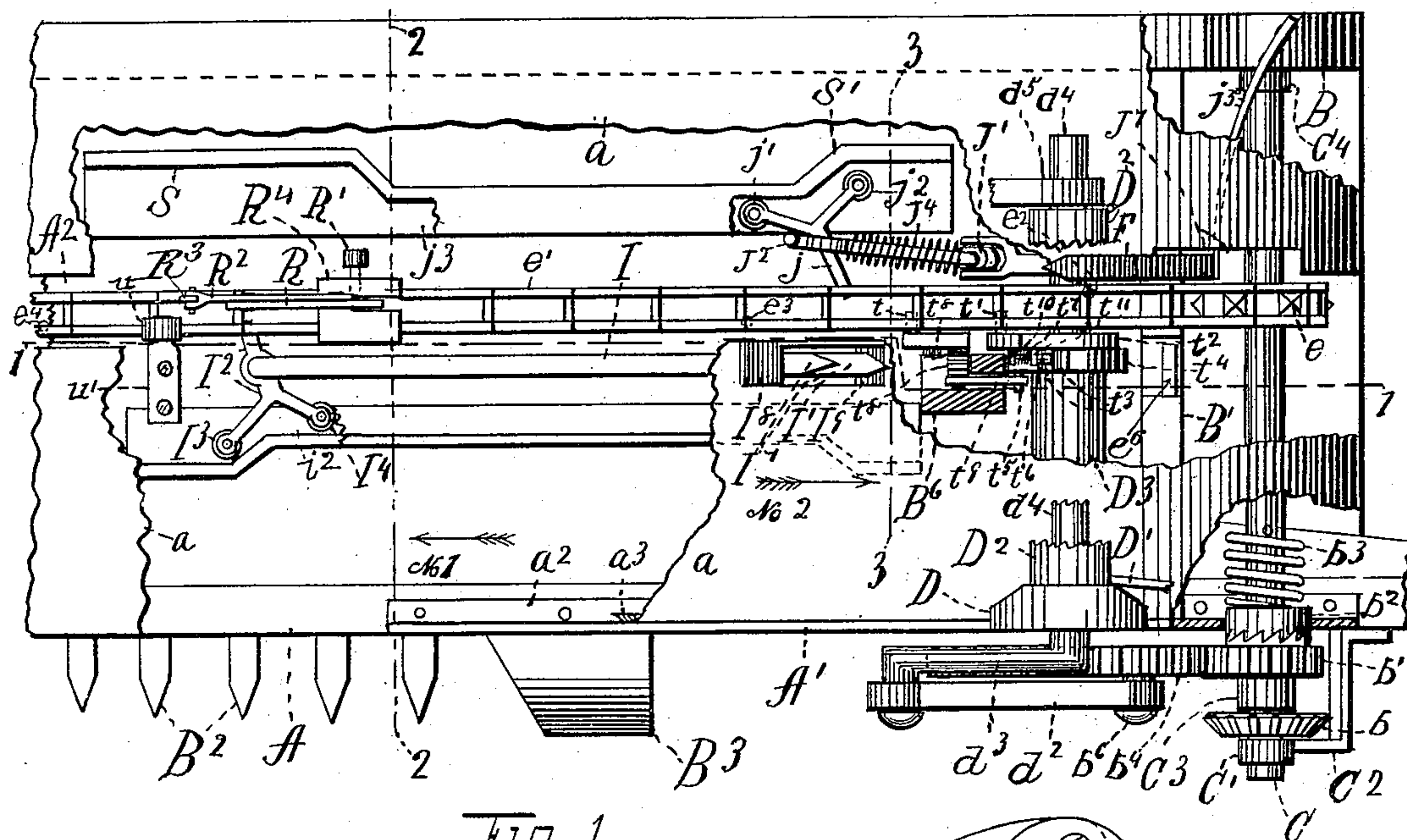


Fig. 1.

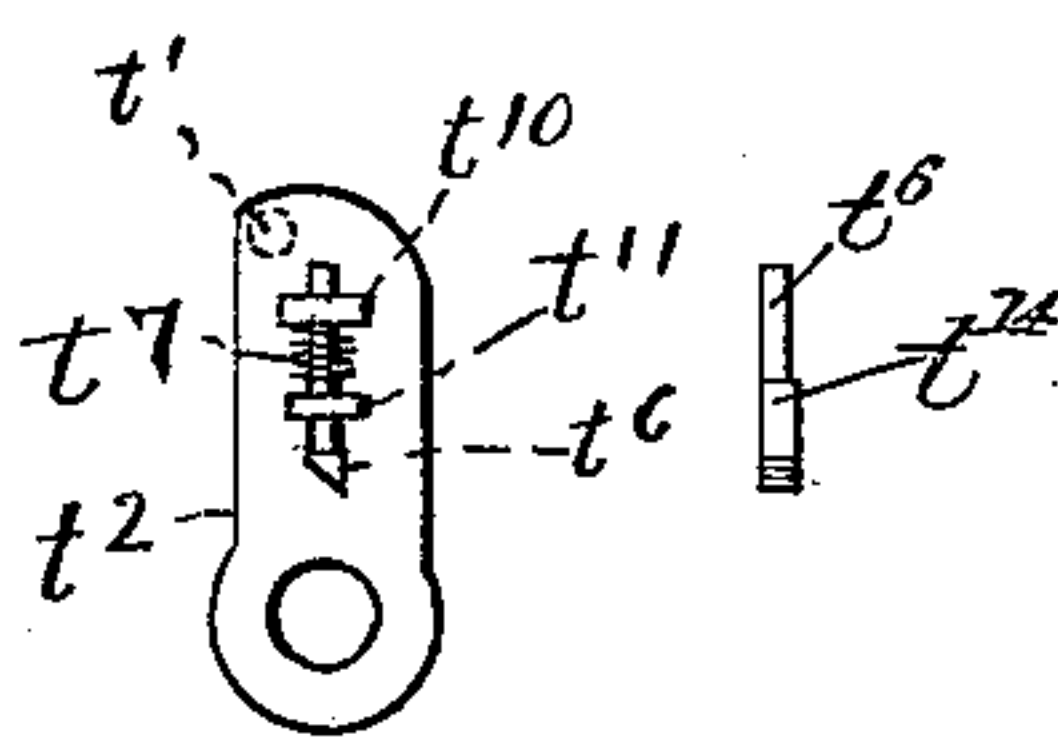


Fig. 2.

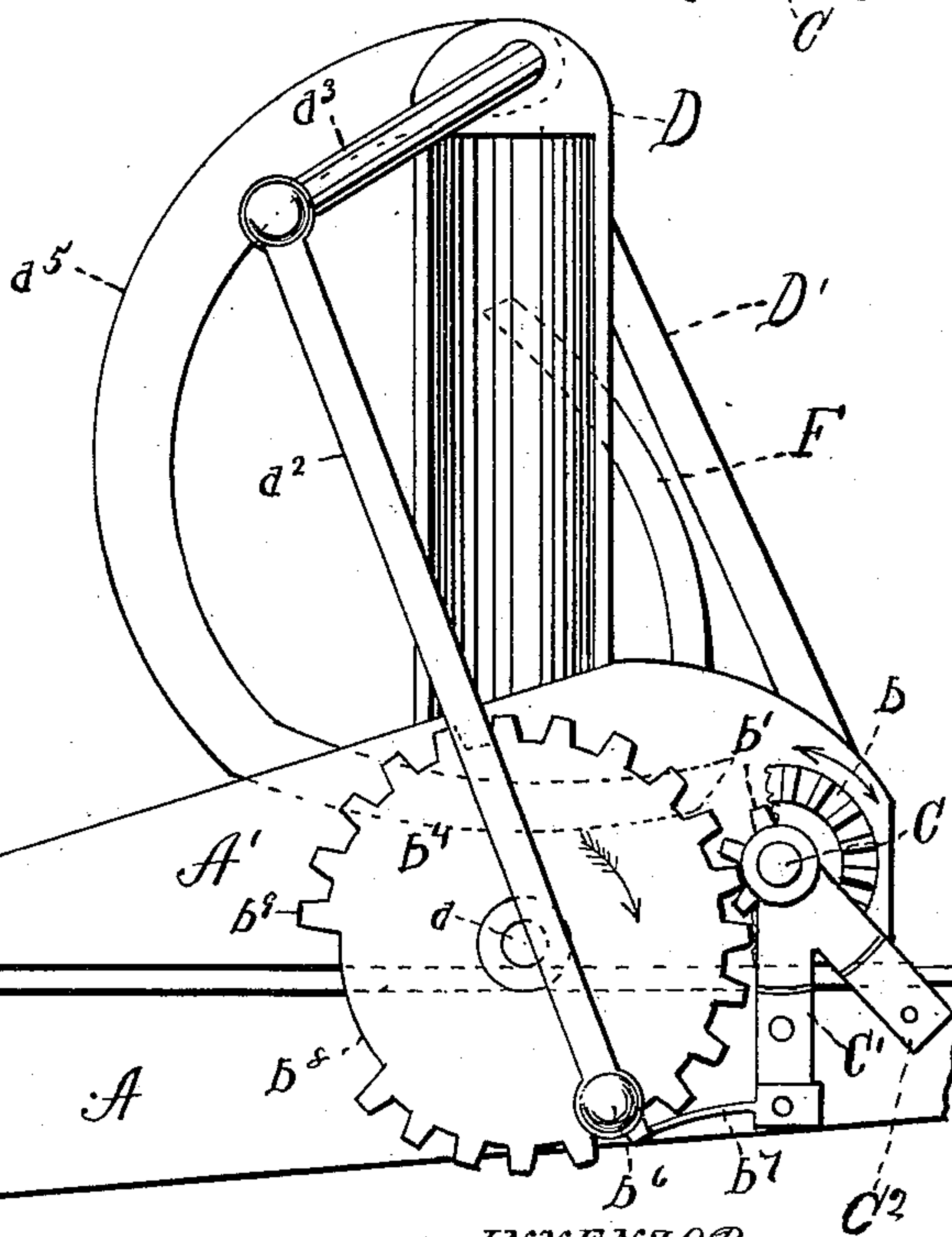
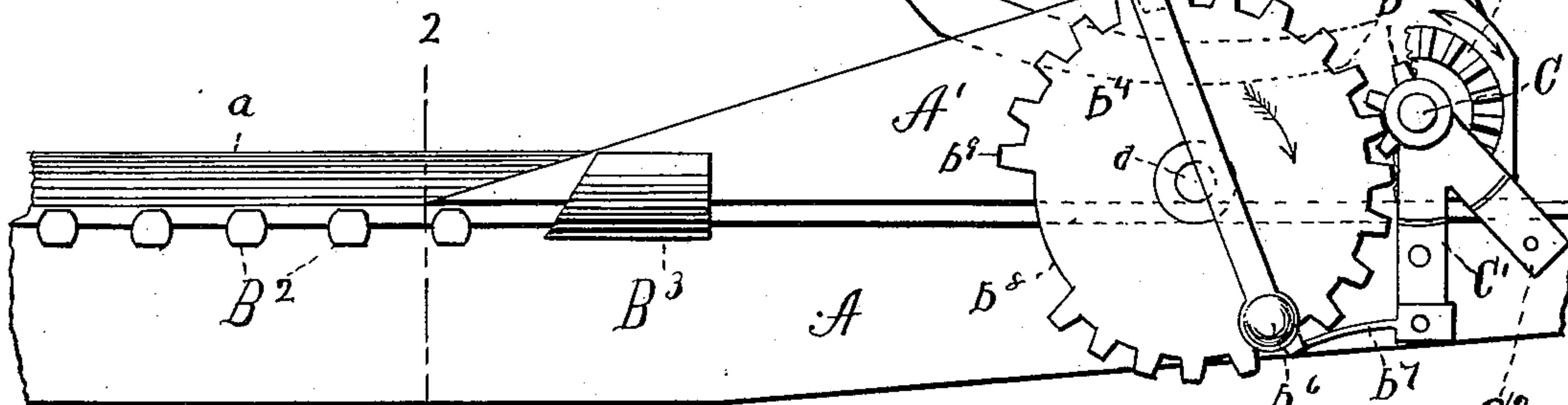


Fig. 3.



WITNESSES

INVENTOR

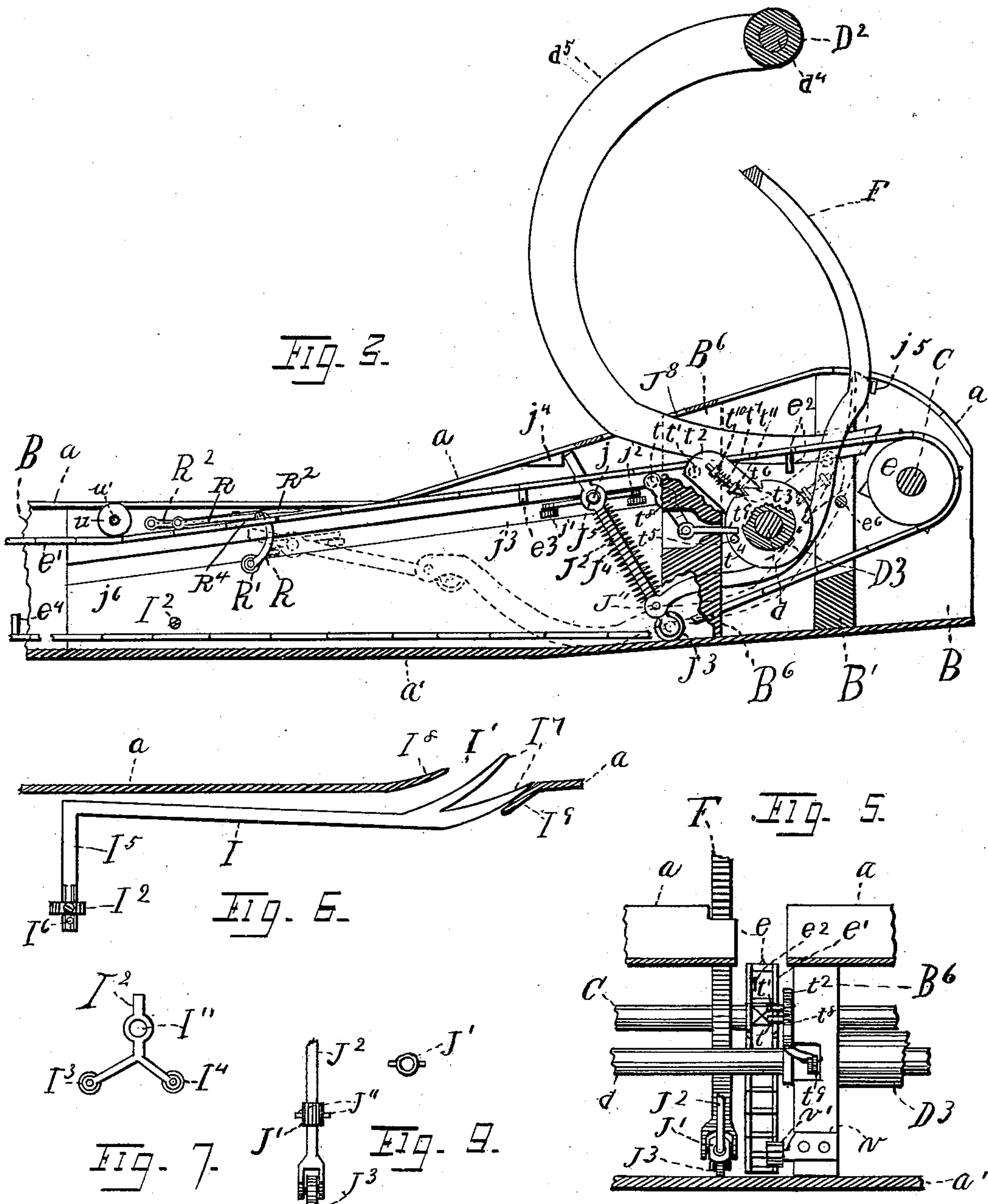
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J. A. McCallum

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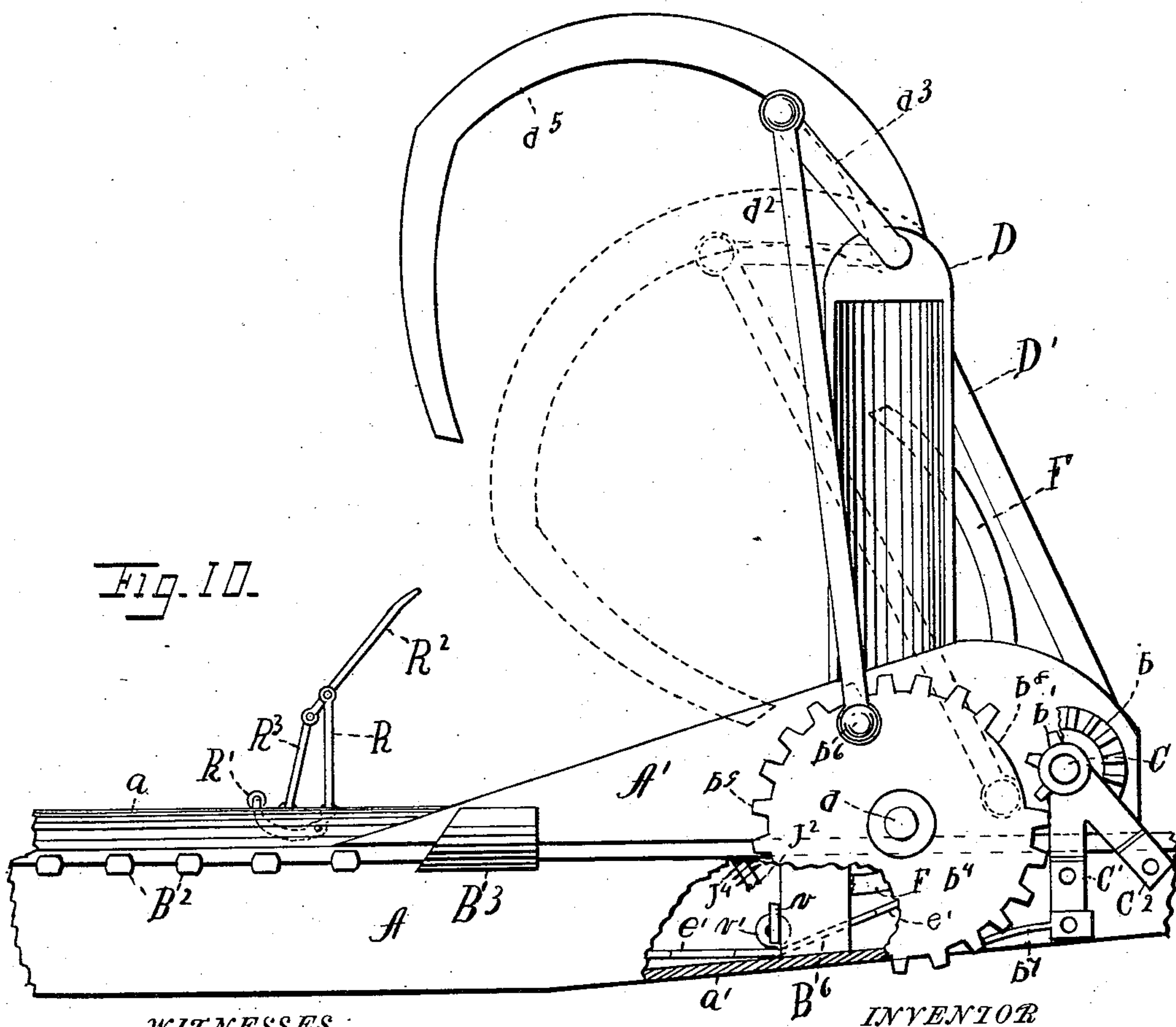
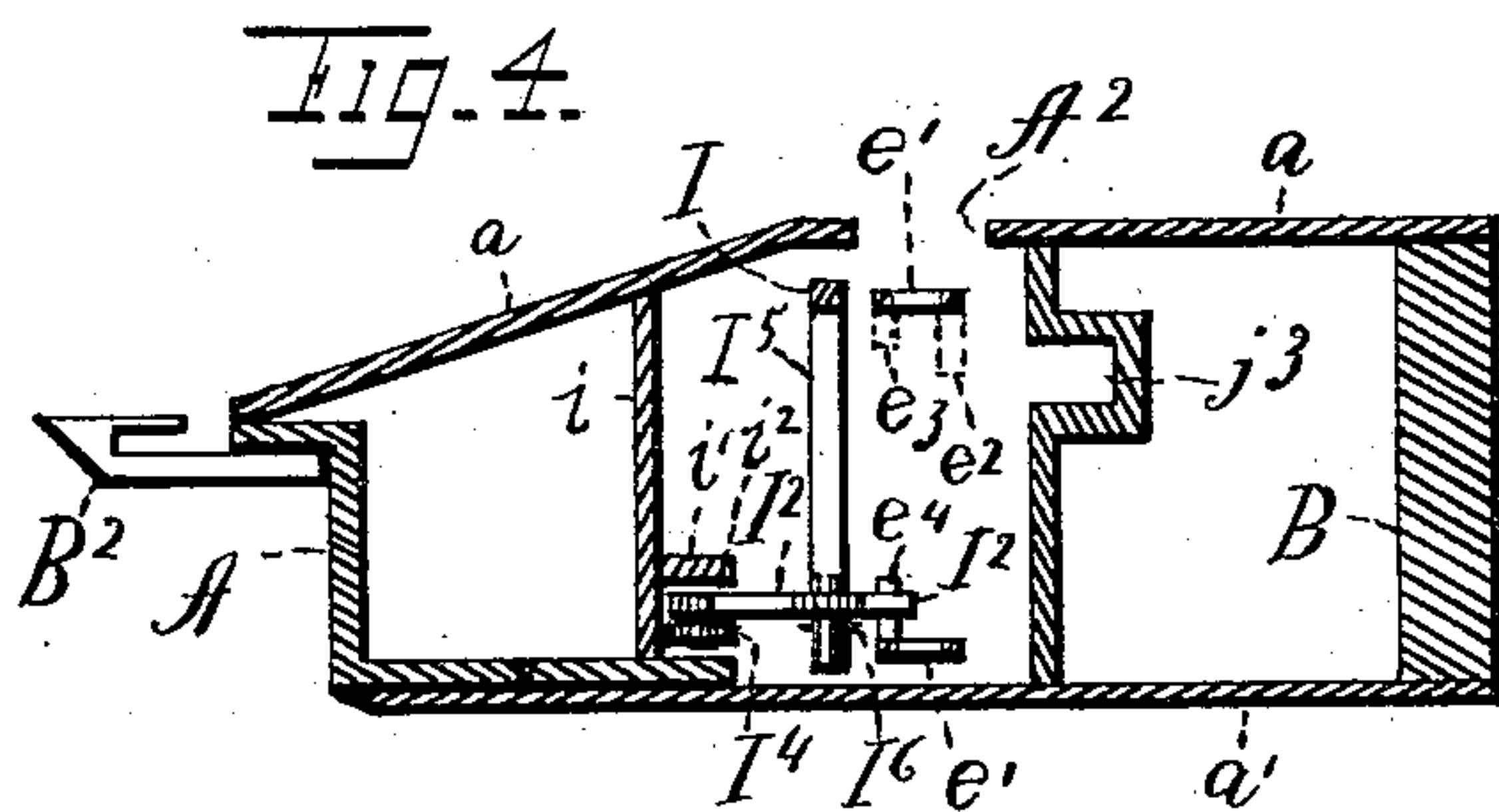
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*WITNESSES*

William Foster  
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George Schubert.



# UNITED STATES PATENT OFFICE.

GEORGE SCHUBERT, OF WALNUT, TEXAS.

## GRAIN-BINDER.

SPECIFICATION forming part of Letters Patent No. 472,143, dated April 5, 1892.

Application filed January 30, 1891. Serial No. 379,744. (No model.)

*To all whom it may concern:*

Be it known that I, GEORGE SCHUBERT, a citizen of the United States, residing at Walnut, in the county of Bosque and State of Texas, have invented certain new and useful Improvements in Grain-Binders; and I do hereby declare the following to be a full, clear, and exact description of the invention, such as will enable others skilled in the art to which it appertains to make and use the same.

This invention relates to an improvement in down-binders or platform-binders, and is especially adapted for the conveyer patented February 17, 1891, No. 446,473, invented by me.

This invention has reference more especially to the compressing, discharging, and starting mechanism for grain-binders.

This improvement relates to the construction and operation of the compressor, the discharging-bar, and a starting mechanism for the binder-gearing, together with other features specified in the claims, so as to adapt to the above-mentioned conveyer the well-known Appleby type of machines—such as is represented, for example, in Letters Patent of the United States granted to George Esterly, No. 262,026, dated August 1, 1882, and No. 266,254, dated October 17, 1882.

By the above-mentioned improvements the needle can be placed above and the tying mechanism below in a narrow space in the platform, so that the grain can be carried by the conveyer direct to and within reach of the binder arm or needle, thus dispensing with the elevating mechanism and packing mechanism, as is shown in the drawings, in which—

Figure 1 is a plan view of a harvester-platform provided with my improvements, the upper plate of the platform being broken away in various parts to show parts below in full lines. Fig. 2 is a front view of the platform and mechanism. Fig. 3 is a longitudinal sectional view on line 1 1, Fig. 1, the post being partly broken away. Parts beyond the section-line are shown in full lines. Fig. 4 is a cross-section on line 2 2, Figs. 1 and 2, looking as indicated by arrow No. 1 in Fig. 1. Fig. 5 is a cross-section on line 3 3 of Fig. 1 with the cross-sill omitted, looking as indicated by arrow No. 2 in Fig. 1, showing parts beyond the section-line in full lines. Fig. 6 is a side

view of the discharger-bar shown in position with parts of the upper plate of the platform shown in section. Fig. 7 is a detail view of the lever on the discharger provided with its anti-friction rollers. Fig. 8 is a detail view of the starting-lever on the shaft *d* and an enlarged plan view of the dog carried by said lever. Fig. 9 is a plan view of the rod provided with the block or ferrule carried by the compressor and a plan view of the ferrule, and Fig. 10 is a front view of the mechanism with the needle elevated.

A designates the finger-bar of the ordinary Z form. Said finger-bar can be extended with its stubbleward end to the harvester-frame. (Not shown in the drawings.)

A' designates an inclined flange extending from near the inner shoe B<sup>3</sup> stubbleward a proper distance, for the purpose hereinafter stated. Said flange A' can be constructed as a part of the finger-bar A, or constructed in a separate piece provided with a right-angled flange *a*<sup>2</sup>, by which it can be secured to the finger-bar A, as shown in Fig. 1.

*a*' designates the lower plate of the platform, secured with its front edge to the lower flange of the finger-bar and with its rear edge to the sill B.

*a* is the upper plate of the platform, secured with its front edge to the upper flange of the finger-bar A and with its rear edge to the sill B. Said sill B forms the rear sill of the platform, and is provided with an inclined extension at its stubble end to correspond with the inclined extension A'.

The plates *a* and *a*' extend stubbleward to the ends of the sill B and the flange A', with the plate *a* curved down at its stubbleward end to partly close the stubble end of the platform, as shown. The front edge of the plate *a* is turned down to a right angle, (indicated at *a*<sup>3</sup> in Fig. 1,) by which it can be secured to the inclined flange A'. On said stubbleward extension of the platform is placed in an upright position the binder-frame D a proper distance stubbleward from the shoe B<sup>3</sup>, as shown, and secured in any suitable manner to the finger-bar and the inclined flange A'.

B' is a cross-sill extending from the finger-bar A and inclined flange A' to the sill B.



Said cross-sill B' is of suitable width to extend from the plate *a'* to the plate *a*, and is placed between the shafts C and *d* and cut out near the center of its length to provide room for the mechanism hereinafter described.

A<sup>2</sup> is a slot left in the upper plate *a* for the operation of the conveyer.

The finger-bar A is provided on its front edge with the usual guards B<sup>2</sup> and a shoe B<sup>3</sup>.

The binder-frame D is of ordinary construction and is in general use. D' is a brace extending from the stubble end of the flange A' to the upper end of the binder-frame D.

C designates a shaft journaled with its rear end in the sill B and with its forward end in the bracket C'. Said bracket C' is provided with an arm C<sup>2</sup> and is secured to the finger-bar A in any suitable manner. Said shaft C is provided with a bevel-pinion *b* adjacent to the rear side of the bracket C' and a pinion *b'* loose on shaft C and located in front of the inclined flange A' and held in position by the ferrule C<sup>3</sup> and clutch *b*<sup>2</sup>. Said clutch *b*<sup>2</sup> is operated by the shaft C and held in position by the spring *b*<sup>3</sup>, which is coiled on the shaft C and presses with one end against the clutch *b*<sup>2</sup> and extends with its other or rear end in a perforation in the shaft C, as shown. C<sup>4</sup> is a collar secured on said shaft C adjacent to the front side of the sill B.

*e* designates a sprocket-wheel secured on the shaft C near the center of the slot A<sup>2</sup> and provided with a chain *e'* to operate the conveyer.

*d* designates a shaft journaled in the lower arm D<sup>3</sup> of the binder-frame D and provided on its forward-projecting end with a cog-wheel *b*<sup>4</sup> in position to be engaged by the pinion *b'*. Said cog-wheel *b*<sup>4</sup> is provided with a blank *b*<sup>8</sup> and a wrist *b*<sup>6</sup>.

*d*<sup>4</sup> designates a shaft journaled in the upper arm D<sup>2</sup> of the binder-frame D and having a crank *d*<sup>3</sup> formed on its forward-projecting end connected to the wrist or stud *b*<sup>6</sup> by the connecting-rod *d*<sup>2</sup>.

*d*<sup>5</sup> is the binder arm or needle secured on the shaft *d*<sup>4</sup> adjacent to the rear end of the arm D<sup>2</sup> and is of ordinary construction. Said needle, the shaft *d*<sup>4</sup>, and arm D<sup>2</sup> are partly broken away in Fig. 1 to show parts below in full lines.

*t*<sup>4</sup> designates a disk secured on the rearward-projecting end of the shaft *d* adjacent to the rear end of the arm D<sup>3</sup>. *t*<sup>3</sup> are two notches formed in the periphery of said disk *t*<sup>4</sup>. One or more such notches may be formed in said disk. (Two are shown in the present instance.) *t*<sup>5</sup> is a stud on its front side and near its periphery, as seen in Fig. 3.

*t*<sup>2</sup> is a lever pivotally secured on the shaft *d* adjacent to the rear side of the disk *t*<sup>4</sup>. Said lever *t*<sup>2</sup> is provided with two lugs *t*<sup>10</sup> and *t*<sup>11</sup> to receive the pawl *t*<sup>6</sup>.

*t*<sup>7</sup> is a spring coiled on the pawl and pressing with its upper end against the lug *t*<sup>10</sup> and

with its lower end on a shoulder *t*<sup>14</sup> of the pawl *t*<sup>6</sup>, pressing the said pawl *t*<sup>6</sup> downward, causing it to engage with the notches *t*<sup>3</sup> of the disk *t*<sup>4</sup>.

*t*<sup>7</sup> is a stud secured in the upper and free end of the lever *t*<sup>2</sup>, projecting rearward and beneath the upper strand of the chain *e'*.

B<sup>6</sup> designates a post extending from the plate *a'* to the plate *a* and placed on the grain side of the arm D<sup>3</sup> with its rear side flush with disk *t*<sup>4</sup>.

*t*<sup>8</sup> is a lever pivoted to the post B<sup>6</sup> a proper distance from its lower end, said lever having its lower end curved forward and a dog or rod *t*<sup>9</sup> pivoted thereto. Said rod *t*<sup>9</sup> projects stubbleward through a perforation in the post B<sup>6</sup> to engage with the stud *t*<sup>5</sup>.

*t* is a stud secured in the upper end of the lever *t*<sup>8</sup>, projecting rearward beneath the upper strand of the chain *e'*.

The perforation in the post B<sup>6</sup> for the rod *t*<sup>9</sup> forms a guide for the stubbleward end of the rod *t*<sup>9</sup>.

I' is an opening made in the plate *a* a short distance grainward from the post B<sup>6</sup> and on the front side of the slot A<sup>2</sup>. A part of the metal is cut loose at both ends. Part I<sup>8</sup> is curved upward and a part I<sup>9</sup> is turned down, as shown in Fig. 6.

I is the discharger-bar provided with two prongs I<sup>7</sup> on its free or stubbleward end to more readily engage the bound sheaf and with its other end extending grainward and bent near to a right angle to near a vertical position, forming the part I<sup>5</sup>, with its lower end rounded to receive the lever I<sup>2</sup>, secured by a key I<sup>6</sup>.

I'' is an eye in the lever I<sup>2</sup> to receive the discharger-bar, as described. Said lever I<sup>2</sup> is bifurcated at one end and provided with anti-friction rollers I<sup>3</sup> and I<sup>4</sup> to operate in the track *i*<sup>2</sup> and projecting with its other end rearward above the lower strand of the chain *e'*. The discharger rests with its rear or grain end on the plate *a'* and with its free or stubbleward end on the downward-projecting portion I<sup>9</sup> on the plate *a* when not in use. The lower flange of the finger-bar can be extended toward the rear, as shown in Fig. 4, to form a projection for the track *i*<sup>2</sup>.

*i* is a strip extending from the lower flange of the finger-bar to the plate *a*. Said strip is provided with a strip *i'* on its rear side, forming the track *i*<sup>2</sup>, in which the anti-friction rollers I<sup>3</sup> and I<sup>4</sup> operate.

F designates the compressor. One or more of such compressors may be employed. (One is shown in the present instance.) Said compressor F is curved about as shown in Fig. 3 with its lower end bifurcated.

J' is a perforated block or ferrule provided with studs J'', by which it is pivoted in the bifurcation of the compressor F.

J<sup>2</sup> is a rod provided with an anti-friction roller J<sup>3</sup> on its lower end to operate on the plate *a'*. Said rod extends through the fer-



rule  $J'$  and is provided with an eye  $J^5$  near its upper end to receive the forward-projecting end of lever  $j$ .

$J^4$  is a spring coiled on the rod  $J^2$ , bearing with its lower end against the ferrule  $J'$  and with its upper end against the shoulder formed by the eye  $J^5$ .

$j^4$  is a block secured on the lower side of the plate  $\alpha$  on the rear side of the slot  $A^2$  and near the stubble end of the track  $j^3$ , as shown in Fig. 3. Said track  $j^3$  is formed as shown in Fig. 4, having its ends  $S$  and  $S'$  turned back or rearward, as shown in Fig. 1, and inclined, as shown in Fig. 3, to correspond to the inclined portion of the chain  $e'$ .

$j$  is a two-armed lever having anti-friction rollers  $j'$  and  $j^2$  on the free ends of its rearward-projecting arms to operate in the track  $j^3$ . Said lever  $j$  projects forward through the eye  $J^5$  of the rod  $J^2$  with its end extending to and beneath the upper strand of the chain  $e'$ .

$j^5$  is a spring secured with one end to the sill  $B$  (near the stubble end of the sill) and with its other and free end pressing against the rear of the compressor, as shown in Fig. 1.

The chain  $e'$  is provided with inwardly-projecting lugs  $e^2$ ,  $e^3$ , and  $e^4$ . The lug  $e^3$  operates on the studs  $t$  and  $t'$  to operate the starting mechanism and is located on the front edge of the chain  $e'$  about two feet in front of or stubbleward from the conveyer. The lug  $e^2$  is located on the rear edge of the chain  $e'$  and is to operate on the lever  $j$  to operate the compressor  $F$  and is placed about two feet stubbleward from the lug  $e^3$ . The lug  $e^4$  is also located on the front side of the chain  $e'$  and about six or eight feet stubbleward from the lug  $e^2$  (said distance depends somewhat on the size of the machine and length of the platform) and is to operate on the lever  $I^2$  to operate the discharger-bar  $I$ . Said lug  $e^4$  is placed on the lower strand of the chain  $e'$  far enough from the conveyer or lug  $e^2$ , so that the grainward movement of the conveyer and upper strand of the chain  $e'$  ceases as the lug  $e^4$  nears the roller  $v'$ . The studs  $t$  and  $t'$  project only to the center of the width of the chain  $e'$ , and thus are not operated by the lug  $e^2$ , and the lever  $j$  also only projects to near the center of the width of the chain, and thus is not operated by the lug  $e^3$ .

The ends of the track  $j^2$  are turned back the same as the track  $j^3$ , as indicated in Fig. 1.

The plate  $\alpha$  is cut out at  $J'$  for the operation of the compressor  $F$  shown in Fig. 1, and  $J^8$  is an opening made in the plate  $\alpha$  for the reception of the needle shown in Fig. 3.

$u'$  is a bracket secured to the under side of the plate  $\alpha$  and on the front side of the slot  $A^2$  and near the grain end of the track  $j^2$ , projecting with its free end rearward over the chain  $e'$  and provided with an anti-friction roller  $u$  in position to operate on the chain  $e'$  to guide said chain.  $v$  is a similar bracket secured to the post  $B^6$  with its anti-friction roller  $v'$  in position to operate on the lower

strand of the chain  $e'$ . Said bracket  $v$  and roller  $v'$  and a part of the post  $B^6$  are omitted from Fig. 3 to show the construction of the compressor and are shown in Fig. 10.

$R$  is the main operating-arm of the conveyer, pivoted near its center to the conveyer-block  $R^4$  and provided on its lower end with an anti-friction roller  $R'$  to operate on the plate  $\alpha$  and having pivoted to its upper end an extension  $R^2$ .

$R^3$  is a rod pivoted with its lower end to the conveyer-block and with its upper end to the grainward end of the extension  $R^2$ , as more fully described in the patent issued to me, No. 446,473, dated February 17, 1891. The conveyer-block  $R^4$  is made about the same thickness as the chain  $e'$ . Said chain  $e'$  is secured to each end of the conveyer-block  $R^4$  with its upper side flush with the upper side of the conveyer-block  $R^4$ , as shown, to operate under the guide-roller  $u$ , as shown.

$b^7$  is a spring secured to the bracket  $C'$ , projecting with its free end grainward in position to engage with the cogs  $b^9$ , as shown.

The bevel-pinion  $b$  is partly broken away in Figs. 2 and 10 to show parts beyond in full lines.

The parts are constructed and arranged to operate as follows, viz: The bevel-pinion  $b$  receives its movement from mechanism (not shown in the drawings) and operates the shaft  $C$ , which in turn operates the pinion  $b'$  by means of the clutch  $b^2$ . Said shaft  $C$  also operates the conveyer by means of the sprocket-wheel  $e$  and chain  $e'$ . As the conveyer moves stubbleward with the gavel of grain the lug  $e^2$  comes in contact with the forward-projecting end of lever  $j$ , moving it stubbleward, thereby shifting the compressor in position, as seen in Fig. 3. As the compressor receives its proper position the roller  $j^2$  will reach the portion  $S'$  of the track  $j^3$ , thereby moving the lever  $j$  to an angle to the chain  $e$  and back to some extent, allowing the lug  $e^2$  to spring the chain  $e'$  and pass the lever  $j$ . As the lever  $j$  is moved rearward it also moves the upper end of the rod  $J^2$  rearward and behind the block  $j^4$ , (see Fig. 3,) thus preventing the rod  $J^2$  from moving grainward when not so desired. The compressor receives its elasticity of compression from the springs  $J^4$  and  $j^5$  and is preferably made of spring-steel of proper thickness, so that it can yield to some extent after the capacity of the springs  $J^4$  and  $j^5$  have been absorbed. After the lever  $j$  is moved to the position as seen in Fig. 1 it is moved far enough rearward, so that the lug  $e^2$  can spring the chain and pass the end of said lever and again engage with it as the lug  $e^2$  is moved grainward. Next the lug  $e^3$  comes in contact with the stud  $t$  on lever  $t^8$ , moving it along, moving the lower end of said lever  $t^8$  grainward, drawing the rod  $t^9$  in the same direction, and thus unlocking the shaft  $d$ . At this time the lug  $e^3$  moves against the stud  $t'$  on lever  $t^2$ , moving it along, (stubbleward,) as



seen in dotted lines in Fig. 3, when it will spring the chain upward and pass the stud  $t'$ . Said movement of lever  $t^2$  causes the shaft  $d$  to make about one-fourth revolution, which brings the needle or binder arm  $b^5$  far enough down to grasp the grain brought in by the conveyer, as shown in dotted lines in Fig. 10. At this time the movement of the conveyer is reversed, and the pinion  $b'$ , being now operated by the clutch  $b^2$  and in engagement with the cog-wheel  $b^4$ , will rotate the latter until the blank  $b^8$  is again opposite the pinion  $b'$ , as seen in Fig. 10. The momentum of the cog-wheel  $b^4$  causes it to move far enough to allow the pinion  $b'$  to rotate in the blank  $b^8$  clear of any friction until the shaft  $d$  is again started, as described. As the conveyer moves grainward, the lug  $e^3$  moves against the stud  $t'$ , moving the lever  $t^2$  back again, as seen in full lines in Fig. 3. Next it moves the lever  $t^8$  back again, as seen in Fig. 3. Next the lug  $e^2$  moves against the lever  $j$ , moving it along, thereby drawing in the compressor in position, as seen in dotted lines in Fig. 3. At this time the lug  $e^4$  comes in contact with the lever  $I^2$ , moving it stubbleward, thus operating the discharger-bar and discharging the bound sheaf. As the roller  $I^4$  reaches the ends of the track  $j^2$ , bent forward, the lever  $I^2$  will move forward and to an angle to the chain  $e'$ , allowing the lug  $e^4$  to spring the chain and pass the lever. At this time the grainward movement of the conveyer ceases. As the conveyer is again started on its stubbleward movement, the lug  $e^4$  comes again in contact with the lever  $I^2$ , moving it grainward, thus drawing in the discharger-bar in position, as indicated in Fig. 6.

When the shaft  $d$  is started, as heretofore described, the cogs  $b^9$  will engage with the pinion  $b'$ , the spring  $b^7$  preventing any rearward movement of the shaft  $d$ , and when the movement of the conveyer is reversed the pinion  $b'$  operates the cog-wheel  $b^4$ , as described. The studs  $t$  and  $t'$  are only indicated in Fig. 3, as they are on the rear side of the levers  $t^8$  and  $t^2$ .

The lever  $t^2$  when in position, as seen in full lines in Fig. 3, rests with the lug  $t^{10}$  against the post  $B^6$ , and when moved, as seen in dotted sides in Fig. 3, it rests on a stud  $e^6$ , secured in a suitable position in the sill  $B'$ , as shown in Figs. 1 and 3.

Having thus described my invention, what I claim, and desire to secure by Letters Patent of the United States, is—

1. In a grain-binder, the combination, with the compressor  $F$ , constructed and arranged about as shown and described, of the rod  $J^2$ , the lever  $j$ , the track  $j^3$ , the block  $j^4$ , and the lug  $e^2$  on a chain  $e'$ , all arranged as shown, and for the purpose described.

2. In a grain-binder, the combination, with the compressor constructed and arranged about as shown and described, of the rod  $J^2$ , the lever  $j$ , provided with anti-friction rollers  $j'$  and  $j^2$ , the track  $j^3$ , as described, the block  $j^4$ ,

and the lug  $e^2$  on chain  $e'$ , all as shown, and for the purpose described.

3. In a grain-binder, the combination, with a compressor constructed about as shown and provided with a block  $J'$ , of a rod  $J^2$ , extending therethrough, and a spring  $J^4$ , a block  $j^4$ , and a spring  $j^5$ , secured to the frame of the machine, with its free end extending to and pressing against the rear of the compressor, as shown, and for the purpose described.

4. In a grain-binder, the combination, with a compressor arranged and constructed about as shown, carrying a block  $J'$ , of the rod  $J^2$ , extending therethrough and provided with an anti-friction roller  $J^3$  in connection with lever  $j$ , the track  $j^3$ , and the lug  $e^2$  on chain  $e'$ , all as and for the purpose described.

5. In a grain-binder, the combination of the discharging-bar  $I$ , provided with one or more prongs at its free end and provided with a lever  $I^2$  in connection with a track  $j^2$ , and a lug  $e^4$  on the chain  $e'$ , all as shown, and for the purpose described.

6. In a grain-binder, the combination of the discharging-bar  $I$ , constructed as shown, provided with one or more prongs on its free end and provided with a lever  $I^2$ , provided with anti-friction rollers in connection with a track  $j^2$ , and a lug  $e^4$  on the chain  $e'$ , all as shown, and for the purpose described.

7. In a grain-binder, the combination, with the platform provided with an upper and a lower floor, of the tracks  $j^3$  and  $j^2$ , arranged therein between the two floors, the levers  $j$  and  $I^2$ , provided with anti-friction rollers to operate in said tracks, a chain  $e'$ , provided with lugs  $e^2$  and  $e^4$  in connection with a compressor, and a discharging-rod  $I$ , constructed about as shown, and for the purpose described.

8. In a grain-binder, the combination, with a platform provided with an upper and a lower floor, of the track  $j^3$ , located therein between the two floors, a compressor provided with a rod  $J^2$  in connection with the lever  $j$ , a chain  $e'$ , and lug  $e^2$ , all operated in between the two floors, as shown, and for the purpose described.

9. In a grain-binder, the combination, with a platform provided with an upper and a lower floor, of the track  $j^2$ , located therein between the two floors, a discharging-bar  $I$ , the lever  $I^2$ , the chain  $e'$ , and the lug  $e^4$ , all as shown, and for the purpose described.

10. In a grain-binder, the combination, with a lever  $t^8$ , provided with a rod  $t^9$ , of a disk  $t^4$ , provided with a pin  $t^5$  and notches  $t^3$ , a lever  $t^2$ , provided with a spring-pawl  $t^6$ , a chain  $e'$ , operated in the platform and provided with a lug  $e^3$ , a cog-wheel  $b^4$ , having a blank  $b^8$ , and a pinion  $b'$  on shaft  $C$ , operated by a clutch  $b^2$ , as and for the purpose described.

11. In a grain-binder, the combination, with a pinion  $b'$ , loose on shaft  $C$  and operated by a clutch  $b^2$ , of a cog-wheel  $b^4$  on shaft  $d$ , provided with cogs  $b^9$  and a blank  $b^8$ , a spring  $b^7$  to engage with the cogs  $b^9$  in connection with a shaft  $C$ , operated alternately in opposite di-



rections, a lug  $e^3$  on the chain  $e'$ , a lever  $t^2$ ,  
pivoted on the shaft  $d$  and provided with a  
spring-pawl  $t^6$ , a notched disk  $t^4$ , secured on  
the shaft  $d$ , provided with a stud  $t^5$ , and a le-  
5 ver  $t^3$ , pivoted in the platform and provided  
with a rod  $t^9$ , substantially as shown and de-  
scribed.

In testimony whereof I have affixed my sig-  
nature in presence of two witnesses.

GEORGE SCHUBERT.

Witnesses:

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