

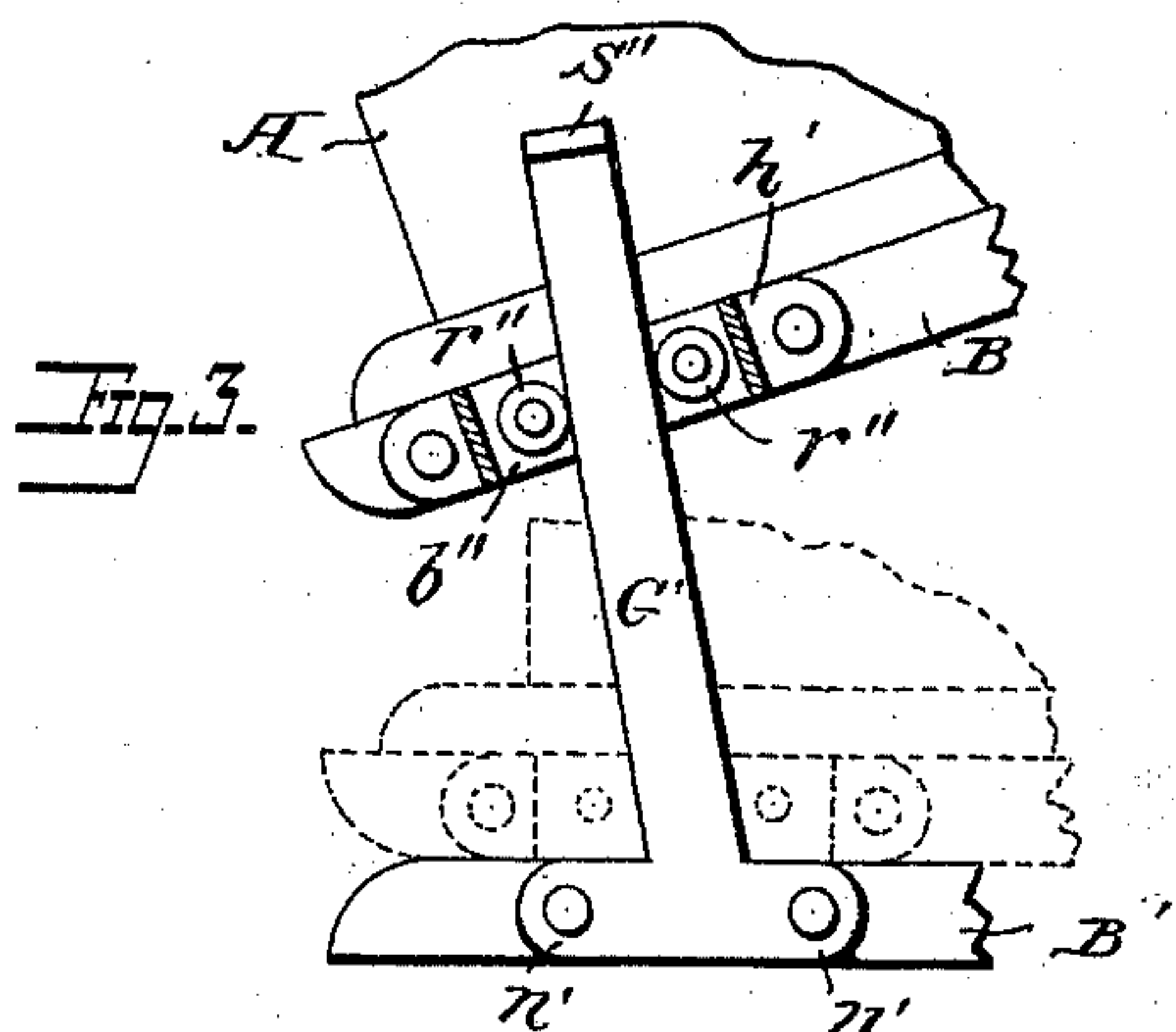
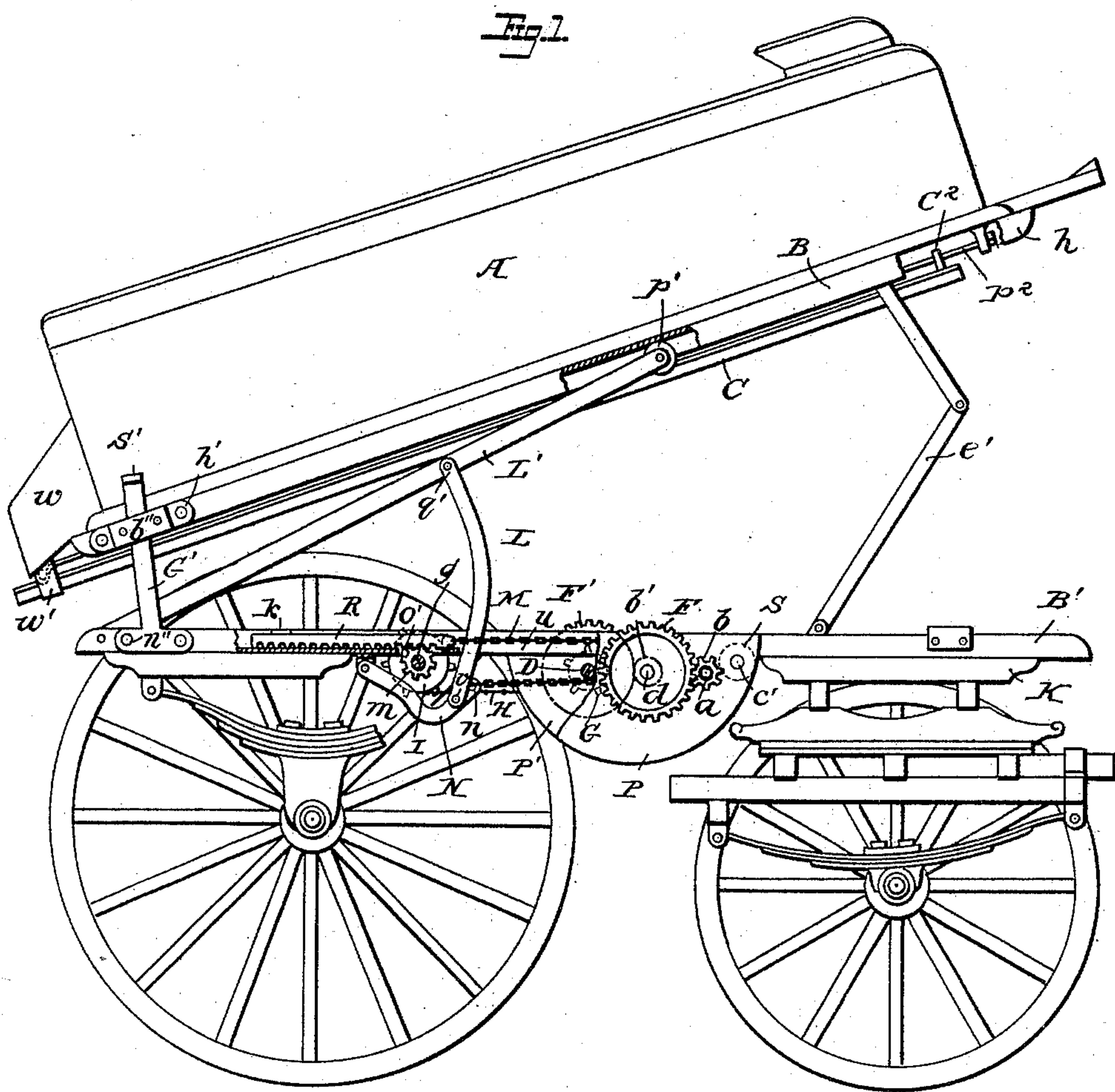
(No Model.)

3 Sheets—Sheet 1.

J. T. RICHARDSON.  
DUMPING WAGON.

No. 495,708.

Patented Apr. 18, 1893.



## Witnesses

Arnoldson

Robert M. P. Milans.

Inventor

Inventor  
J. P. Richardson  
By *John Freeman*

Attorneys

(No Model.)

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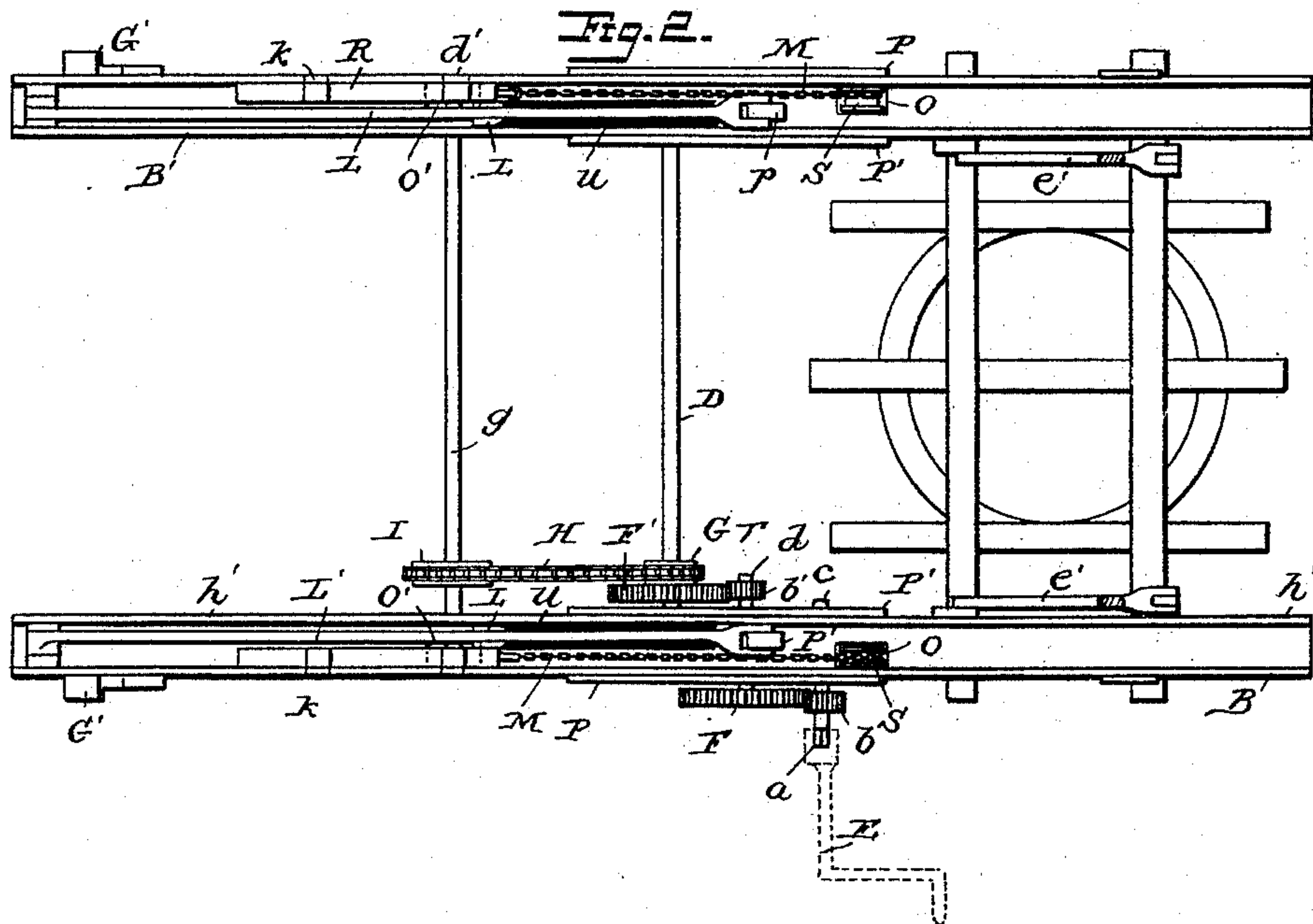


Fig. 4.

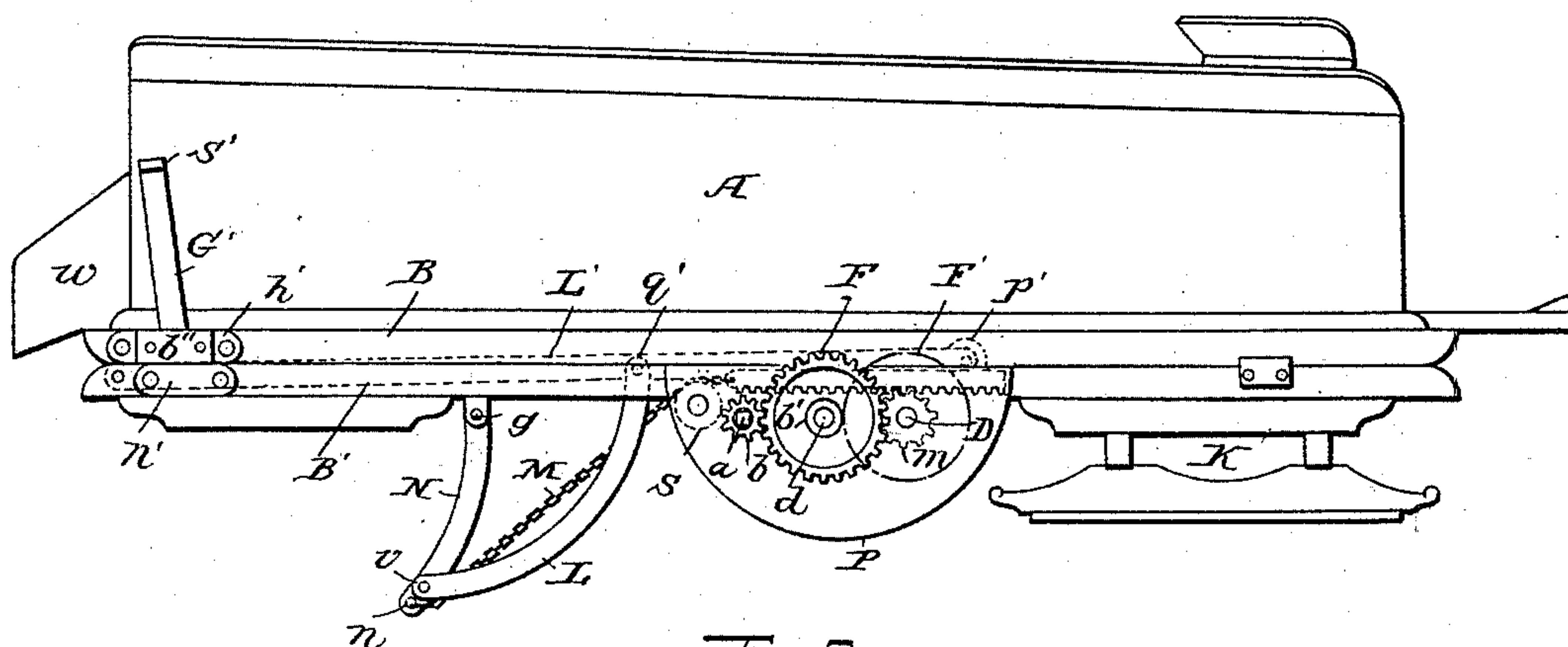
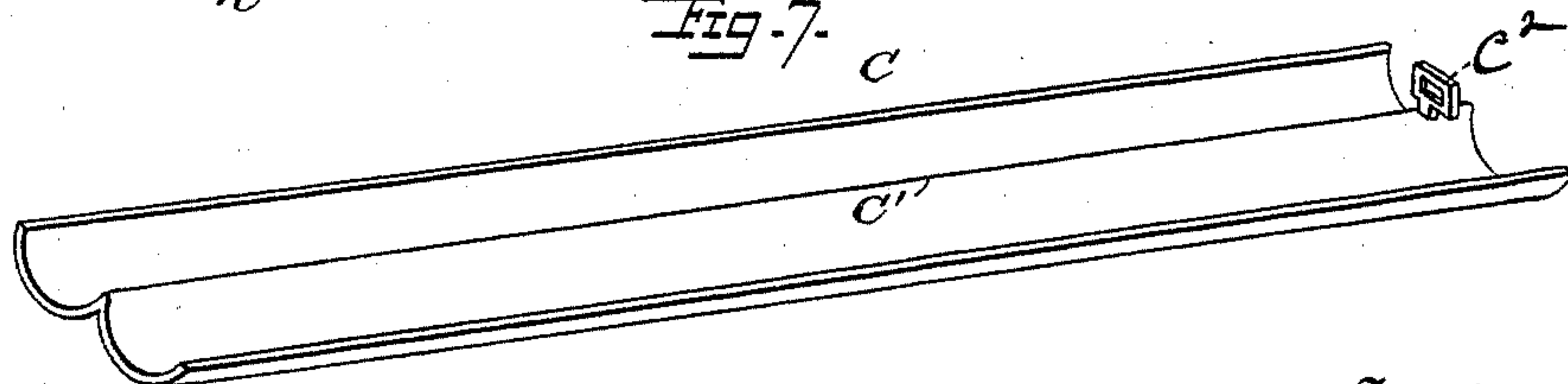


Fig. 7.



Witnesses

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(No Model.)

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Fig. 5.

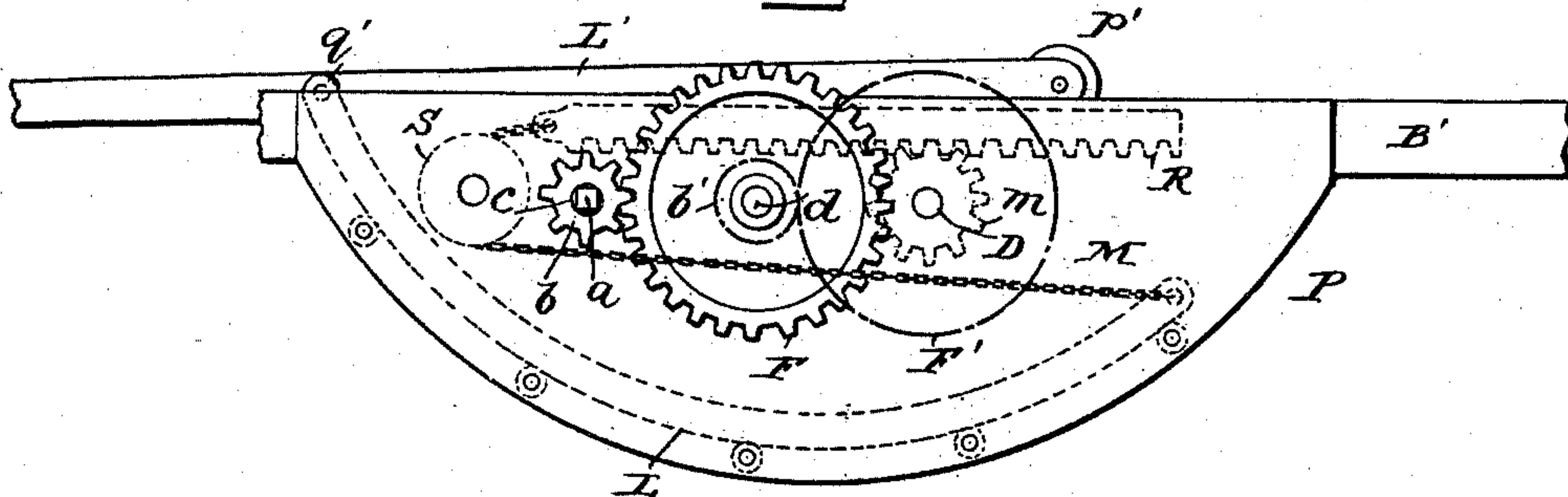


Fig. 6.

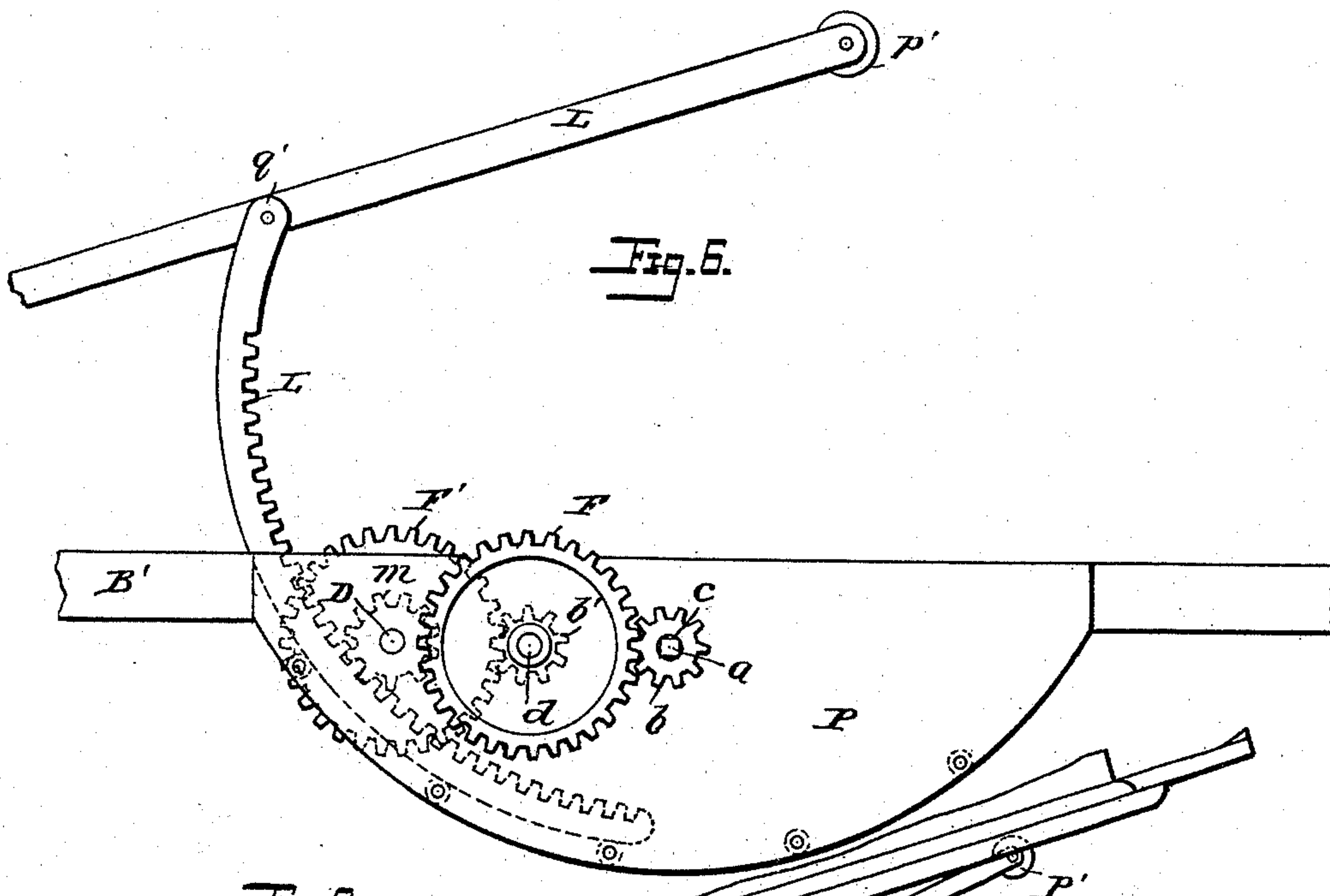
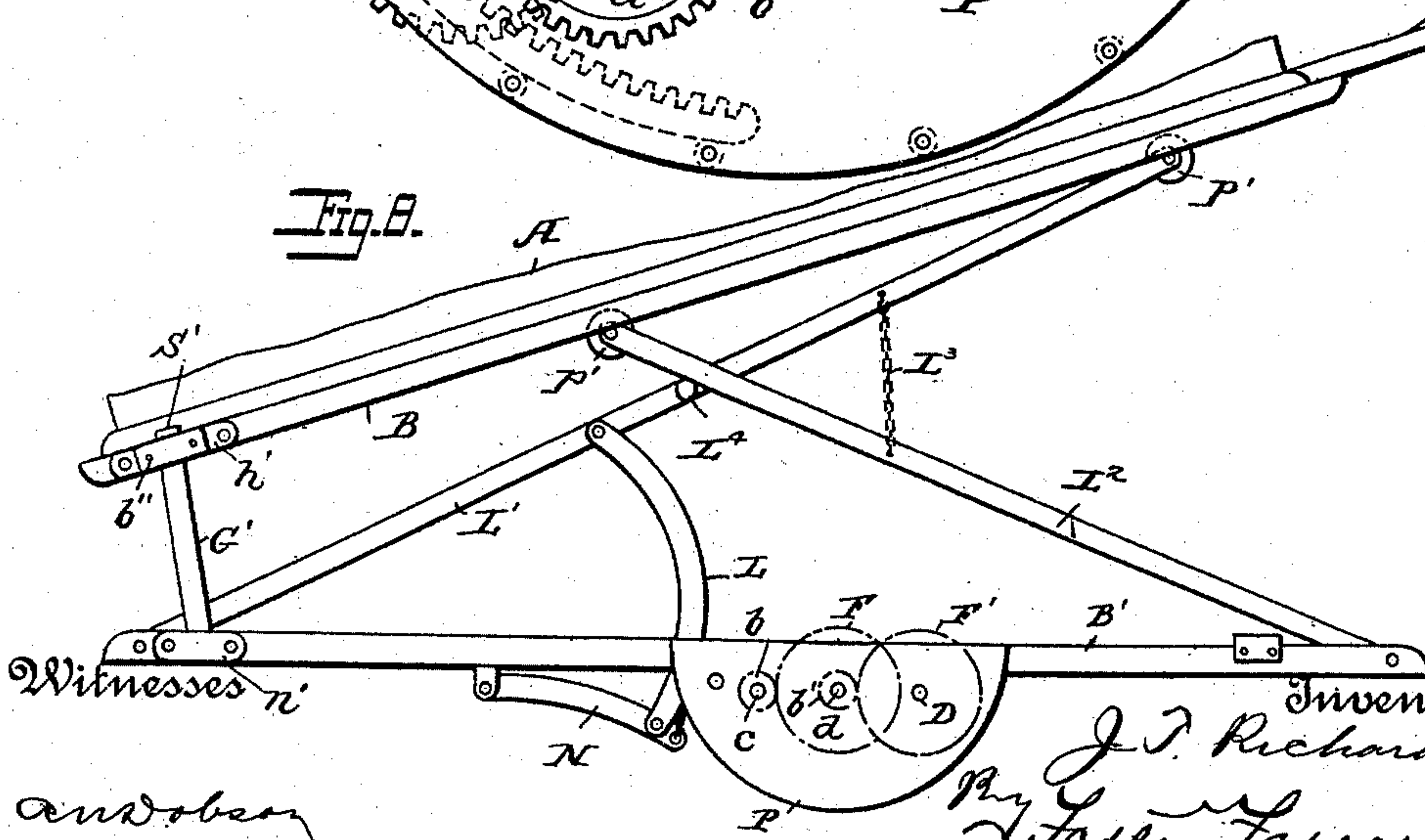


Fig. 7.



Witnesses  
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# UNITED STATES PATENT OFFICE.

JOHN T. RICHARDSON, OF HARRISBURG, ASSIGNOR OF ONE-HALF TO ALEXANDER H. EGE, OF MECHANICSBURG, PENNSYLVANIA.

## DUMPING-WAGON.

SPECIFICATION forming part of Letters Patent No. 495,708, dated April 18, 1893.

Application filed January 26, 1893. Serial No. 459,867. (No model.)

*To all whom it may concern:*

Be it known that I, JOHN T. RICHARDSON, residing at Harrisburg, Dauphin county, Pennsylvania, have invented certain new and useful Improvements in Dumping-Wagons, of which the following is a specification.

The object of my invention is to secure an improved and expeditious means for the ready transportation and unloading of coal, sand, crushed stone, or other loose material, and the deposit of the same at the desired place of unloading to the saving of time and expenditure of labor.

My invention consists of an improved mechanism for elevating both the front end and rear end of my wagon body, or of the front end only, if desirable; said mechanism being utilized by means of a crank and a system of gearing from a common point of initial movement, and by a continuous motion at will.

Figure 1 is a side elevation of my improved dumping wagon, the wheels having been removed on the side next the observer. Fig. 2 is a top plan view of the wagon frame or truck having the body removed. Fig. 3 is a side view of the rear guides or standards between which the rear end of my wagon body is raised and maintained with the inclosing friction box attached showing the friction pulleys in place and the heads of the bolts or rivets by which said box is fastened to the downward projecting flanges of the channels. Fig. 4 is a modification in which the lifting arcs and stirrups of my wagon are brought farther forward toward the center of the wagon body, and the chain connected with the end of the rack so that the latter may travel toward the front part of the wagon and upon the opposite side of the grooved wheel, the reverse of the movement shown in Figs. 1 and 2. Fig. 5 is a modification in which I dispense with the use of the stirrups and reverse the direction of the curves of my arc lifters so that the said lifters are made to travel behind an apron or housing toward the front of the wagon when the body is being lowered for the seclusion and protection of the same when not in use. Fig. 6 is a modification of Fig. 5 in which my arc lifters are made to perform the additional function of a rack, while at the same time securing the protection of my apron

housing as shown in Fig. 5. Fig. 7 is a view showing the delivery chute detached; and Fig. 8, is a skeleton view showing the lifting arcs used in connection with two lifting levers on each side.

To describe my invention in detail, I will designate the wagon box or body in each of the figures thereof by the letter A. I prefer to make said body somewhat deeper in its rear end than front for obvious reasons.

The frame work upon which the wagon body A rests consists, primarily, of four channel plates B B B' B' made preferably of steel, two channel plates B B' being on each side of the wagon, and so situated as to engage each other face to face, flange engaging flange, and thus constituting when in longitudinal contact an open chamber, the use of which is hereinafter described. The upper channel plates B B are fastened securely and rigidly to the bottom face of the sills of the body A by rivets or other efficient means, the flat bottoms of the channels B B, being placed upward, and the flanges *h h'* downward as before mentioned. The lower channels B' B' are placed in a reverse position to those of their oppositely engaging plates or channels B B, and securely fastened to the short rails or sills K K of the supporting truck of the wagon.

In Figs. 1, 4, 5, 6, it is seen that the power used to elevate the body A to the desired position in dumping is applied to the crank E attached to the hub *a* of the pinion *b*, which is securely fastened to the short shaft *c* attached to the channel B', and the downwardly projecting plates P, P', (which are securely fastened to the outer and inner flanges of said channel B') and keyed or otherwise secured in place that the pinion *b* may perform in turn its required function. By further reference to said figures, it is seen that the pinion *b* meshes into the cogged periphery of the wheel F fitted upon the short shaft *d* also attached to the said channel and the said plates P P', and terminating in the pinion *b'* in close proximity to the said inner plate P'. The said wheel F by its revolution transmits its motion to the said pinion *b'* which in turn meshes into the cogged periphery of the wheel F', and thence by the revolution of its shaft D, is secured



the revolution of the small sprocket wheel G located and fixed also upon the same shaft D. Again said wheel meshes the spines embossed upon its periphery into the links of the endless sprocket chain H, which also encircles the second sprocket wheel I, similarly embossed. The said wheel I being fitted fast to the shaft *g* journaled through the bearing plates P P' and its co-ordinate box bearing *d'* attached to the opposite channel B', transmits its motion to the pinions *m, m* attached to the same. Said pinions *m, m* mesh through the orifices *o' o'*, piercing the bottoms of the channels B' B' into the cogs of the racks R R traveling upon the horizontal upper inner surfaces of the channels B' B' and held in close contact with said pinions *m m* by keepers *k k* bolted fast and overlapping to the upturned outer flanges of the said lower channels B' B'.

The said racks R R, having received a longitudinal motion from the pinions *m, m* toward the rear ends of the channels B' B' draw in the same direction the chains M M whose ends are fastened or swiveled to one of the ends of the rack plates R, R. The said chains M M maintain substantially horizontal positions with the depression of the channels B' B' until they reach the sprocket or grooved pulleys S S (revolving upon the short shaft *c'* lying to the front of the shaft *c* and similarly journaled) around which pulleys they are extended downward through the underlying orifices O, O and continued at an incline toward the rear end of the wagon and fastened by the terminal links to the lower extremities *n, n*, of the swinging stirrups, N N. Said stirrups N, N are swiveled at their upper ends by means of bolts or similar devices, to the box or plate bearings of the shaft *g*. At a distance of two or three inches more or less from said lower ends *n, n* of the said stirrups N, N, I swivel the lower extremity, *v, v* of my arc lifters L, L in order that they may be capable of being moved upward in vertical planes through orifices *u, u* piercing the bottoms of the channels B' B' under the tension of the chains M, M when they are drawn over the pulleys S, S, by the application of the power aforesaid. The upper extremities *q', q'* of the arc lifters L L are furnished with jaws, or similar bearings for the reception therein or attachment thereto of the lifting levers L' L' lying loosely therein or swiveled fast thereto, said levers L' L' being swiveled at their rear termini to the channels B' B' at or near the rear ends of the latter, the forward termini of said levers L' L' being made to impinge freely by friction pulleys *p', p'* or directly against the inner flat bottoms of the upper channels B B for the purpose of elevating the body A under the upward vertical motion of the arc lifters L, L, ensuing upon the operation of the mechanism above described.

In cases in which the weights to be lifted are not in excess of two thousand pounds, for instance, I prefer to dispense in practice with the sprocket wheels G, I, and chain H entirely

since the power generated by the remaining gearing will be sufficient to elevate the average weight communicated directly by the racks R, R through the medium of the grooved pulleys S, S, to the chains M, M, and connected mechanism as hereinbefore described. In this case, however, the shaft *g* may be omitted and the cogged wheel F' instead of being between the wheel F and the rear end of the wagon body A, is placed between said wheel F and the front end of the body, as shown in Figs. 4, and 5. By reference thereto it is seen that the action of the engaging mechanism is the same as hereinbefore described, though the direction of revolutions and movement of the racks are in opposite directions to those hereinbefore described. The grooved pulley wheels S S are also to the rear of the other wheels instead of in front thereof.

In practice I prefer to make the stirrups N N to swing from their upward terminal swivels when I wish to limit the length of the arc lifters L, L, as shown in the different figures. In some cases, however, it may be desirable to increase the length of the arc lifters; and hence to allow the lower ends thereof to travel within suitable bearings attached to the lower ends *n n* of the stirrups N, N, in which case I prefer to make the said stirrups rigid, and hence attach their upper ends fixedly to suitable bearings fastened to the rear wheel axle of the wagon, or at some most eligible point at or near the rear ends of the channels B', B'.

In Fig. 1 the bridle bars *e', e'* are shown as consisting each of two unequal arms or parts that are each swiveled terminally together; and at their opposite ends swiveled to the upper and lower inner flanges respectively of the upper and lower channels B B' B'. The function of said bridle bars *e', e'* is that of limiting at its front end the upward motion of the body A upon the elevation of the same in use, and retaining it stationary at said limit while the continuous power is being applied to the raising of the rear end of the said body A.

For convenience in depositing the contents of my wagon I locate an opening more or less centrally in the tail board of my wagon body A, and from thence extend to the rearward thereof, a spout *w* of suitable length, and somewhat narrower at its point of delivery in order to facilitate the flow of said contents into my chute C. At the free end of said spout *w* I attach a stirrup *w'* for the rear support of my chute rod *p<sup>2</sup>* as hereinafter more fully described.

In such cases as it is not desirable to dump the contents of my wagon body A directly from the spout *w* at a near point of delivery, but to deposit the same at a greater or less distance inaccessible by the wagon, I propose to use a chute C, consisting of one or more longitudinal sections telescoping together, and hence capable of being elongated at will to the desired length for convenient deposit. As the distance from the rear end of the



wagon to which the contents thereof is to be delivered may be considerable, and hence the weight to be sustained by the chute C is also proportionately increased I propose to make my chute to consist of two or more longitudinal channels, the seam of division between the said channels being so strengthened by one or more longitudinal bars C' in addition to the sheeting (or by the use of some other equivalent strengthening device) in order to attain with a minimum weight of chute, a maximum strength thereof against or in support of the superimposed weight that cannot be efficiently delivered by the ordinary single channel chute. Also in such cases as I cannot deliver the contents of my wagon to a point inaccessible to the rear of my wagon directly, owing to the fact that said point is only approachable at some angle other than a right angle, I have so attached my chute C terminally to the said spout *w* of my body A as to admit of the chute being swung to one side at the desired angle for said delivery. For this purpose I swivel a bar or similar appliance to a convenient point on the under side of the bottom of the wagon body A, at the front end thereof and of such a length that it will project in the rear to a short distance beyond the spout end *w*, the said projection resting in a stirrup *w'* or similar device attached to the end of said spout, as and for the purpose hereinbefore described.

To the front end of my chute, I attach an eye bolt C<sup>2</sup> of sufficient opening as to admit of its sliding freely thereupon to the extent of the length of the rod which terminates at its free end in a hook to which the eye of the bolt is suspended when the chute is drawn out to its limit, and thus admits of the lateral movement of the free end of the chute to any point desired at angular intersection with the line of the wagon bed as hereinbefore mentioned.

The rear gate of my wagon body A is the ordinary lifting door swiveled more or less centrally to a laterally vibrating bar, which in turn, is swiveled to the lifting lever which has also an upward and downward motion in the vertical plane of the body end at a greater or less amplitude.

The advantages that I claim in the attachment of my channel plates B B B' B' to the body and truck rails of my wagon are greatly increased strength of body and truck frame, ease of adjustment of the same in place, and the attainment of a housing of protection by the longitudinal contact of the oppositely engaging flanges of the said channels, said housing being utilized for the reception of the horizontal mechanism when the wagon is in transit, or not being used in process of elevation for dumping.

As it may also be desirable under some circumstances to equally protect the lifting arcs L, L, I do so by reversing the direction of the curves of said arcs, and draw them, when not in use, in the direction of the front end of the

wagon body (instead of in the reversed direction toward and below the axle of the hind wheels as hereinbefore described) as shown in Fig. 1. In this case, I extend the plate P of Fig. 5 vertically downward to such an extent as to constitute the same upon the outer sides, as aprons; while upon the inner faces thereof and at a sufficient distance below the under faces of the channels B' B' for my purpose, I securely fasten friction bearings *x* in such continuity of curvature as will coincide with the curvatures of the arc lifters L, L, and of about the same length as the curved portion of said arc lifters. By this arrangement as shown in Fig. 5, I dispense with the use of the stirrups N, N, and connect the chains M M by their end links directly with the ends *v*, *v*, of the arc lifters L, L, and the ends of the racks R R hereinbefore mentioned.

In case I wish to combine the function of my racks R R shown in Figs. 4, 5, as traveling within the depression of the channels B' B' with that of my arc lifters L, L, in one appliance, I indent the inner curved surfaces or edges of my said arc lifters with cogs; and by locating them within the apron housings P P as described and shown in Fig. 5, I secure the additional modification as shown in Fig. 6.

By reference to Fig. 3, I show my guides G' G' or backwardly inclined standards (about thirty degrees from vertical) wrought in the form of an inverted and inclined T, the transverse arms of which *n' n'* being bolted or otherwise securely fastened to the outer flanges of the lower channels B' B' for the purpose of maintaining the upwardly inclined guide bearings G' G' in a fixed position. In connection with said guides and inclosing the same upon the outer sides, I use brackets or holders *h' h'* containing one or more friction pulleys *r'' r''* so placed and retained as to admit of their rolling upon the upwardly inclined edges of the guides G' G', said pulleys *r'' r''* revolving upon axles journaled or fastened into drillings piercing the covering portions of the boxes *b'' b''* as shown in Fig. 3. The guides G' G' terminate upwardly in a stop S'' whose function is to limit the elevation of the rear end of the wagon.

In Fig. 8 I have shown the lifting arcs in substantially the form shown in Fig. 1, connected to the lifting lever L', pivoted at one end of the channel, while at the other end of the channels is pivoted another bar L<sup>2</sup>, also having a roller *p'* at its end bearing on the under side of the upper channels B, and two lifting levers are connected so as to operate together. These lifting levers may be connected in any way as by a chain L<sup>3</sup>, or a stud L<sup>4</sup>, projecting from the side of one of the levers, and on which the other lever rests. The operation of these levers will be readily understood, and is substantially similar to that of the single pivoted lever. The arc levers act directly on the levers L', and these levers operate levers L<sup>2</sup>, by means of the studs or other connecting devices, so that the fore end



of the wagon body is raised first and as it is raised, the levers  $L^2$ , act upon the rear portion, and cause that to rise also. It will be seen that both sets of levers  $L'$  and  $L^2$ , are  
 5 pivotally connected in the channels, but to opposite ends of the truck frame.

The chute as before intimated is preferably made so as to practically form two channels; thus in Fig. 7, the chute C is provided with a  
 10 central rib  $C'$ , the bottoms of the channels being curved as shown. This not only gives a broader channel but adds strength thereto, and serves as a substantial place for the attachment of the eye-bolt  $C^2$ .

15 While I have shown the chute with two channels, of course there may be more.

I claim—

1. In a dumping wagon, the combination of the body, the truck or supporting frame, the  
 20 oppositely engaging channels  $B B B' B'$  securely fastened, the two  $B B$  to the lower side sills of the wagon body, and the two  $B' B'$  to the upper side rails of the truck, so that the flanges of the upper channels may engage with  
 25 the flanges of the lower channels, each to each, for the attainment of an inclosed chamber or housing, and gear wheels or equivalent operating mechanism, for the elevation and lowering of the dumping wagon, substantially as  
 30 hereinbefore described.

2. In a dumping wagon, the combination of the body A, the truck or supporting frame D, the oppositely engaging channels  $B B B' B'$  securely fastened, the two  $B B$  to the lower  
 35 side sills of the wagon body, and the two  $B' B'$  to the upper side rails of the truck, so that the flanges of the upper channels may engage with the flanges of the lower channels, each to each, for the attainment of an inclosed  
 40 chamber or housing, racks traveling in said channels and gear wheels or equivalent operating mechanism, for the elevation and lowering of the dumping wagon, substantially as hereinbefore described.

3. In a dumping wagon, the combination of the body A, the truck or supporting frame, D, the oppositely engaging channels  $B B B' B'$  securely fastened, the two  $B B$  to the lower  
 45 side sills of the wagon body, and the two  $B' B'$  to the upper side rails of the truck, so that the flanges of the upper channels may engage with the flanges of the lower channels, each to each, for the attainment of an inclosed  
 50 chamber or housing, racks traveling in said channels, chains attached to the racks for the transmission of the power generated by the gear wheels or equivalent operating mechanism for the elevation and lowering of the  
 55 dumping wagon, substantially as hereinbefore described.

4. In a dumping wagon, the combination of the body A, the truck or supporting frame, D, the oppositely engaging channels  $B B B' B'$ , securely fastened, the two  $B B$  to the lower  
 60 side sills of the wagon body, and the two  $B' B'$  to the upper side rails of the truck, so that the flanges of the upper channels may engage

with the flanges of the lower channels, each to each, for the attainment of an inclosed chamber or housing, racks traveling in said  
 70 channels, chains attached to the racks for the transmission of the power generated by the gear wheels, lifting arcs  $L L$  attached to the rack chains, and gear wheels or equivalent operating mechanism for the elevation and  
 75 lowering of the dumping wagon, substantially as described.

5. In a dumping wagon, the combination of the body A, the truck or supporting frame, D, the oppositely engaging channels  $B B B' B'$  securely fastened, the two  $B B$  to the lower  
 80 side sills of the wagon body, and the two  $B' B'$  to the upper side rails of the truck, so that the flanges of the upper channels may engage with the flanges of the lower channels, each to each, for the attainment of an inclosed chamber or housing, racks traveling in  
 85 said channels, chains attached to the racks for the transmission of the power generated by the gear wheels, lifting arcs  $L L$ , attached to the rack chains, lever lifters  $L' L'$  attached to the arc lifters  $L L$ , and gear wheels or equivalent operating mechanism for the elevation and lowering of the dumping wagon,  
 90 substantially as described.

6. In a dumping wagon, the combination of the body A, the truck or supporting frame, D, the oppositely engaging channels,  $B B B' B'$ , securely fastened, the two  $B B$  to the lower  
 95 side sills of the wagon body, and the two  $B' B'$  to the upper side rails of the truck, so that the flanges of the upper channels may engage with the flanges of the lower channels, each to each, for the attainment of an inclosed chamber or housing, racks traveling in  
 100 said channels, chains attached to the racks for the transmission of the power generated by the gear wheels, lifting arcs  $L L$  attached to the rack chains, lever lifters  $L' L'$  attached to the arc lifters  $L L$ , bridle bars  $e' e'$ , and gear wheels, or equivalent operating mechanism, for the elevation and lowering of the  
 105 dumping wagon, substantially as described.

7. In a dumping wagon, the combination of the body A, the truck or supporting frame, D, the oppositely engaging channels,  $B B B' B'$  securely fastened, the two  $B B$  to the lower  
 110 side sills of the wagon body, and the two  $B' B'$  to the upper side rails of the truck, so that the flanges of the upper channels may engage with the flanges of the lower channels, each to each, for the attainment of an inclosed chamber or housing, racks traveling in  
 115 said channels, chains attached to the racks for the transmission of the power generated by the gear wheels, lifting arcs  $L L$  attached to the rack chains, lever lifters  $L' L'$  attached to the arc lifters  $L L$ , bridle bars  $e' e'$ , chute C, and gear wheels or equivalent operating mechanism for the elevation and lowering  
 120 of the dumping wagon, substantially as described.

8. In a dumping wagon, the combination of the body A, the truck or supporting frame, D,



the oppositely engaging channels B B B' B' securely fastened, the two B B to the lower side sills of the wagon body, and the two B' B' to the upper side rails of the truck, so that the flanges of the upper channels may engage with the flanges of the lower channels, each to each for the attainment of an inclosed chamber or housing, racks traveling in said channels, chains attached to the racks for the transmission of the power generated by the gear wheels, lifting arcs L L attached to the rack chains, an apron housing P for the reception of the arc lifters L L, and chains M M, and gear wheels, or equivalent operating mechanism, for the elevation and lowering of the dumping wagon, substantially as described.

9. In a dumping wagon, the combination of the body A, the truck or supporting frame D, the oppositely engaging channels B B B' B', securely fastened, the two B B to the lower side sills of the wagon body, and the two B' B' to the upper side rails of the truck, so that the flanges of the upper channels may engage with the flanges of the lower channels, each to each, for the attainment of an inclosed chamber or housing, racks traveling in said channels, cogged lifting arcs, and gear wheels or equivalent operating mechanism for the elevation and lowering of the dumping wagon, substantially as described.

10. The combination with a wagon bed provided with mechanism for elevating both ends of the wagon body, the inclined guides G' G'

and the friction pulleys  $r' r'$ , or either of them, so held in boxes  $b'' b''$  or other equivalent appliances as to retain the pulleys  $r' r'$  in contact with the guides G' G', substantially as described.

11. In a dumping wagon the combination with the body and the truck frame, of lifting levers pivotally mounted at opposite ends of the frame with their free ends bearing on the under portion of the wagon body, and means for raising the levers, substantially as described.

12. In a dumping wagon the combination with the wagon body and the truck frame, of two sets of lifting levers pivotally mounted at opposite ends of the frame with their free ends bearing against the under side of the wagon body, lifting mechanism connected to one set of levers, and connections between the two sets so that they will both be lifted to completely raise the wagon body, substantially as described.

13. In a dumping wagon the combination with the wagon body, of a chute formed of two channels having a central rib between them, substantially as described.

In testimony whereof I have signed my name to this specification in the presence of two subscribing witnesses.

JOHN T. RICHARDSON.

Witnesses:

WM. H. MIDDLETON,  
WM. B. KLINE.