(No Model.) 2 Sheets—Sheet 1.

# J. D. REAM & M. LEWIS.

## GRAIN ELEVATOR.

No. 572,448. Patented Dec. 1, 1896.

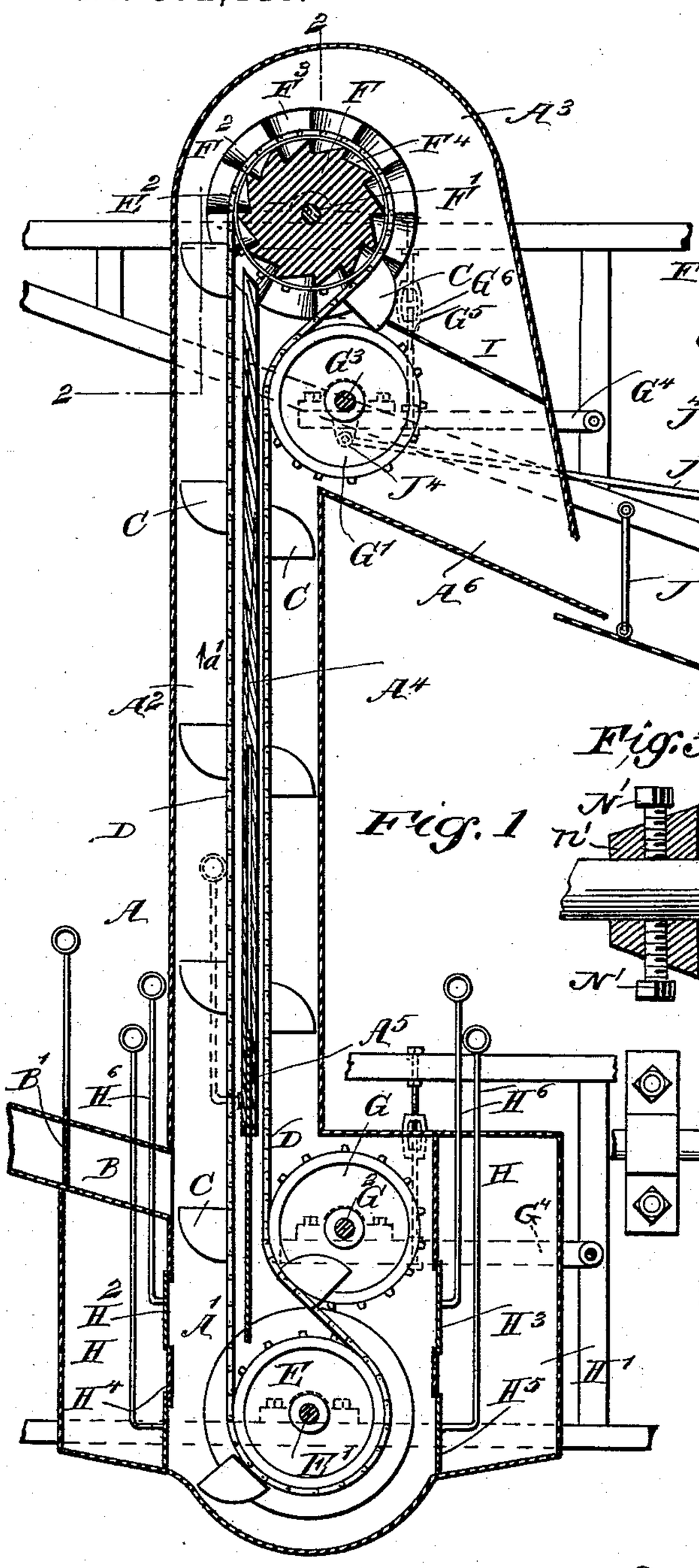

Fig. 1

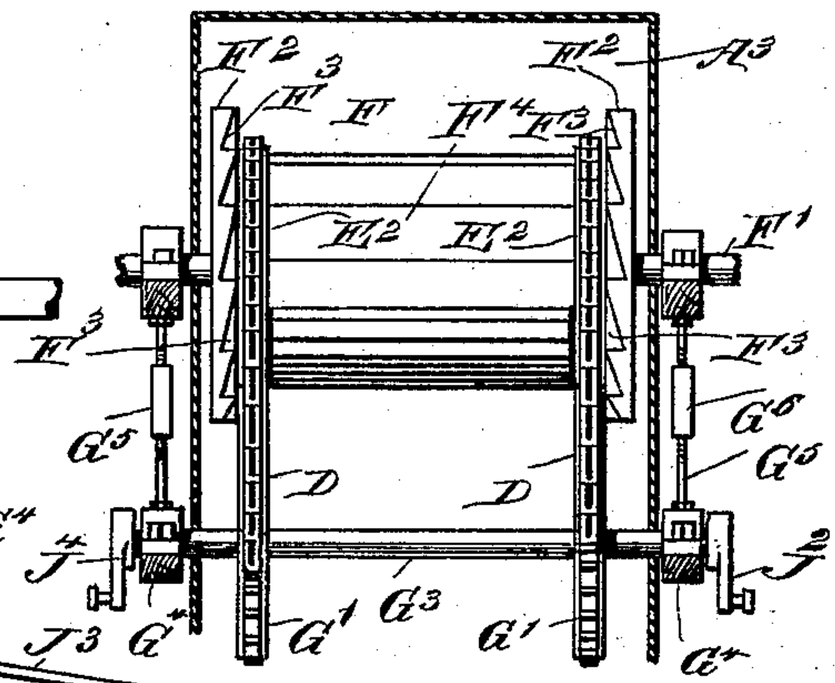

Fig. 2

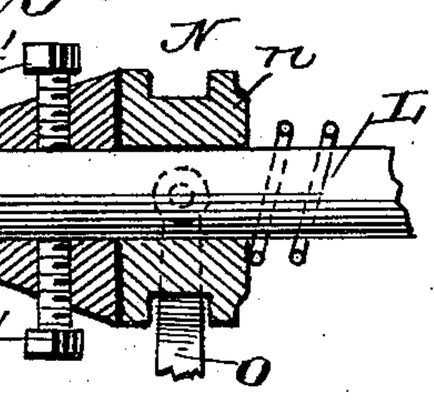

Fig. 3



Fig. 3a.

WITNESSES:

John A. Berglund

Theo. G. Hoster

INVENTORS

J. D. Ream

M. Lewis

BY Munn & Co

ATTORNEYS.

(No Model.) 2 Sheets—Sheet 2.

# J. D. REAM & M. LEWIS.

## GRAIN ELEVATOR.

No. 572,448. Patented Dec. 1, 1896.

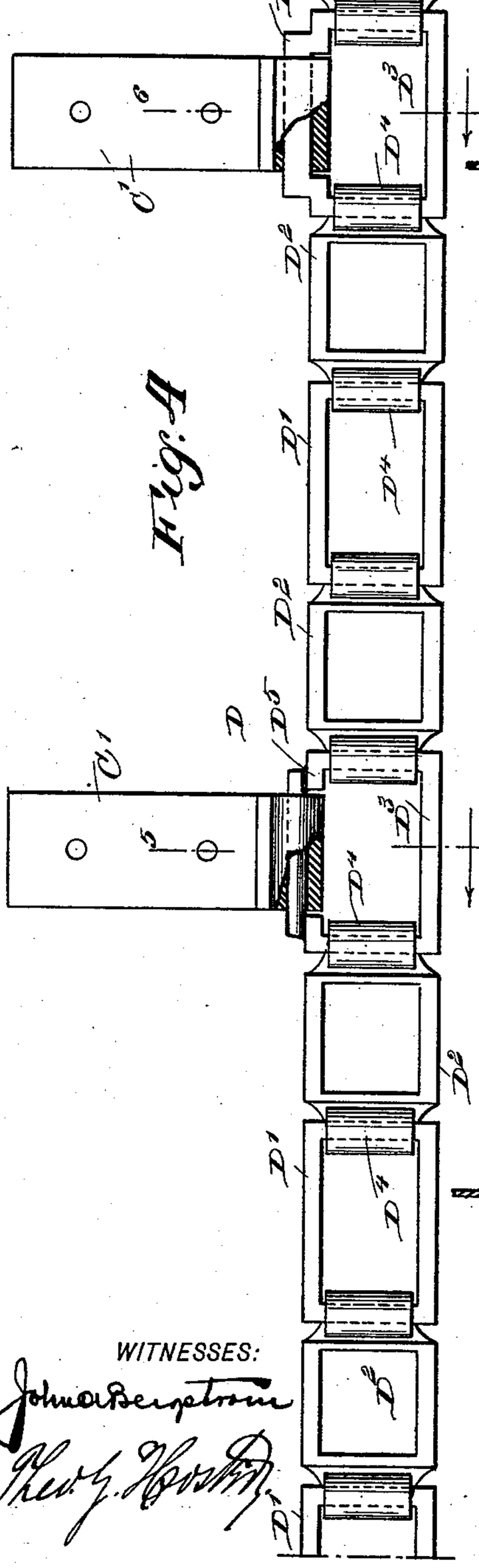

Fig. 4.

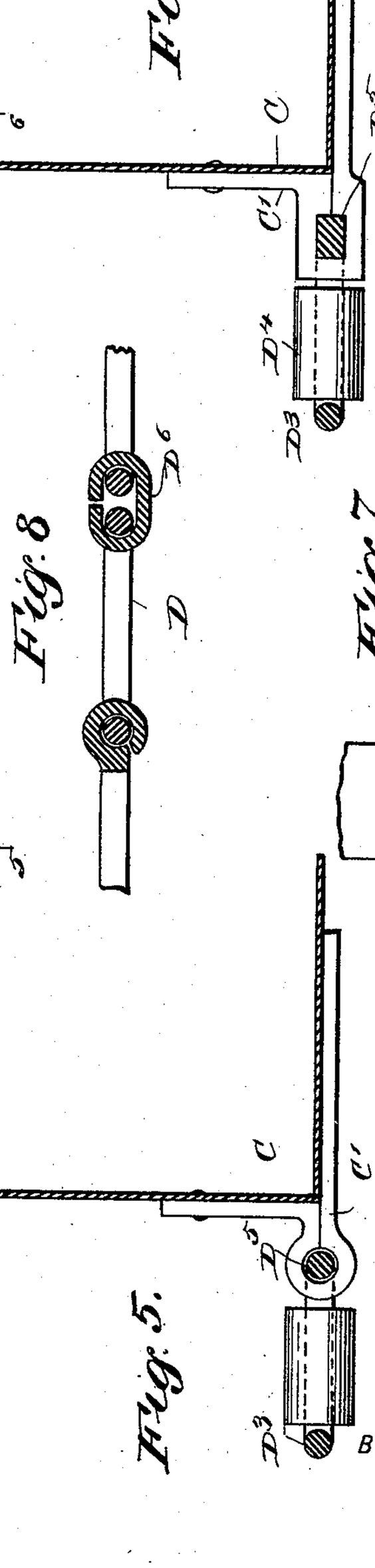

Fig. 6.



Fig. 8.

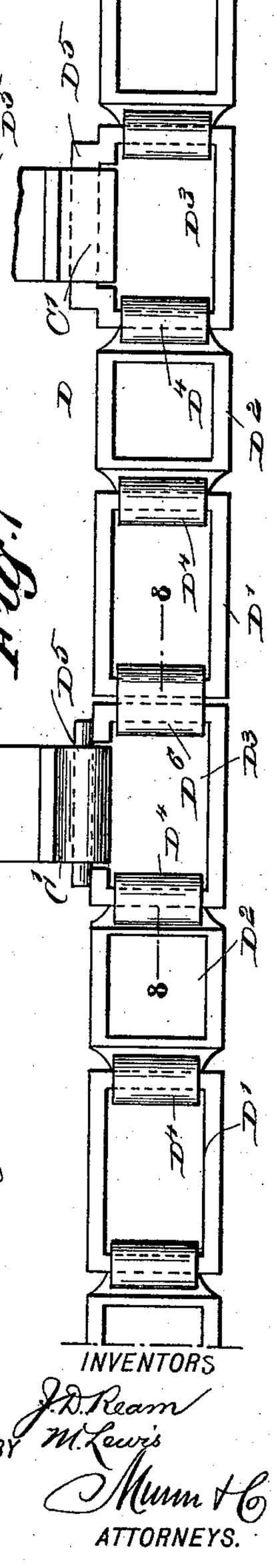

Fig. 7.



Fig. 5.

WITNESSES:

John A. Bergstrom

Henry J. Hoskin

INVENTORS

J. D. Ream

M. Lewis

BY Munn & Co

ATTORNEYS.

# UNITED STATES PATENT OFFICE.

JAMES D. REAM AND MOSES LEWIS, OF BROKEN BOW, NEBRASKA.

## GRAIN-ELEVATOR.

SPECIFICATION forming part of Letters Patent No. 572,448, dated December 1, 1896.

Application filed August 4, 1894. Serial No. 519,469. (No model.)

*To all whom it may concern:*

Be it known that we, JAMES D. REAM and MOSES LEWIS, of Broken Bow, in the county of Custer and State of Nebraska, have invented a new and Improved Grain-Elevator, of which the following is a full, clear, and exact description.

The object of the invention is to provide a new and improved grain-elevator which is comparatively simple and durable in construction and arranged to relieve the buckets of surplus grain and to permit of charging the casing with surplus grain without removing the latter from the casing.

The invention consists principally of a casing provided with an inlet, and relief chambers each having an inlet and an outlet gate to connect the interior of the chambers with the casing.

The invention also consists of certain parts and details and combinations of the same, as will be hereinafter described and then pointed out in the claims.

Reference is to be had to the accompanying drawings, forming a part of this specification, in which similar letters of reference indicate corresponding parts in all the figures.

Figure 1 is a sectional side elevation of the improvement. Fig. 2 is a transverse section of the same on the line 2 2 of Fig. 1. Fig. 3 is a plan view, with parts in section, of the clutch mechanism. Fig. 3ª is a sectional view of a portion of the same. Fig. 4 is an enlarged plan view of part of the elevator sprocket-chain with parts in section. Fig. 5 is a transverse section of the same on the line 5 5 of Fig. 4. Fig. 6 is a like view of the same on the line 6 6 of Fig. 4. Fig. 7 is a plan view of a modified construction of the chain, and Fig. 8 is a sectional side elevation of the same on the line 8 8 of Fig. 7.

The improved grain-elevator is provided with a casing A, formed at its lower end with the receiving-compartment A′, connected by a vertically-disposed leg $A^2$ with the outlet or discharge chamber $A^3$, as plainly illustrated in Fig. 1. Into the receiving-compartment A′ leads the supply-pipe B, through which the grain passes to the elevator, the said supply-pipe being provided with a suitable gate B′ to control the inflow of the grain to the receiving-compartment A′ of the casing.

The supply-pipe B discharges into the buckets C, held on a pair of sprocket-chains D, passing over sprocket-wheels E, secured on a shaft E′ and arranged in the receiving-compartment A′ and over sprocket-wheels $E^2$, held on a drum F, arranged in the outlet compartment or chamber $A^3$ and secured on a shaft F′. The shafts E′ and F′, carrying the said sprocket-wheels E and the drums F, respectively, are adapted to be driven from suitable machinery, so that a traveling motion is given to the chains D and the buckets C in the direction of the arrow *a*′. The two runs of the sprocket-chains D are separated from each other and guided by parting strips or guides $A^4$, arranged in the leg $A^2$ and provided at their lower ends with a slidable partition or extension $A^5$, adapted to pass with its lower end into close proximity to the sprocket-wheels E, as plainly shown in Fig. 1.

The downwardly-moving runs of the sprocket-chains D pass over intermediate sprocket-wheels G and G′, respectively, secured on transversely-extending shafts $G^2$ and $G^3$, respectively, as plainly shown in the drawings. The shafts $G^2$ and $G^3$ are journaled in bearings attached to arms $G^4$, pivoted on the frame of the elevator and supported on adjustable links $G^5$, preferably made in two parts united by a turnbuckle $G^6$, as plainly indicated in Figs. 1 and 2. By this arrangement the arms $G^4$ may be swung up or down, so as to move the sprocket-wheels G and G′ in a like direction to regulate the tension of the sprocket-chains D, as the case may require.

On opposite sides of the receiving-compartment A′ are arranged the grain-relief compartments H and H′, provided with inlet-gates $H^2$ and $H^3$, respectively, and with outlet-gates $H^4$ and $H^5$, respectively, located below the said inlet-gates $H^2$ and $H^3$ and discharging into the bottom curved part of the receiving-compartment A′. Each of the gates $H^2$ $H^3$ $H^4$ $H^5$ is provided with a rod $H^6$, extending to the outside of the elevator-casing and under the control of the operator, so as to permit the latter to open or close either of the said gates, as desired.

Now it will be seen that when the elevator-casing becomes choked with grain, so as to prevent the buckets C and chains D from

properly working, then the operator opens the gates $H^2$ and $H^3$ to permit the surplus grain to pass into the relief-compartments H and H′. When the proper working is restored, then the operator closes the gates $H^2$ and $H^3$ and opens the gates $H^4$ and $H^5$ to permit the surplus grain in the said relief-compartments H and H′ to pass into the lower part of the receiving-compartment A′, whereby the buckets C take up the surplus grain and elevate the same in the usual manner. The buckets C discharge into the compartment $A^3$ onto a fixed sieve I, slightly inclined and extending transversely from side to side of the compartment, as plainly indicated in Fig. 1. The grain after passing through the sieve I passes into the outlet-chute $A^6$, which discharges onto a riddle J, hung on links J′ and pivotally connected with levers $J^2$, fulcrumed on the framework of the elevator. The levers $J^2$ are pivotally connected at their upper ends by links $J^3$ with crank-arms $J^4$ on the shaft $G^3$, carrying the sprocket-wheels G′, as previously described, so that the rotary motion given to the said sprocket-wheel by the moving sprocket-chains D causes a rotating of the shaft $G^3$, so that the crank-arms $J^4$ impart, by the links $J^3$, a swinging motion to the levers $J^2$ and a consequent shaking motion to the riddle J. The drum F, previously mentioned and arranged in the upper compartment $A^3$ of the casing A, is provided with flanges $F^2$, formed on the inner faces with pockets $F^3$, adapted to receive any loose grain falling out of the buckets and to carry this grain to the underflow-space under the pockets $F^3$ into pockets $F^4$, formed transversely in the periphery of the said drum F and connecting at their ends with the said pockets $F^3$. The grain in the said pockets $F^4$ is carried by the revolving drum to be finally discharged onto the sieve or screen I with the other grain discharged onto the said sieve or screen from the buckets.

In order to transmit the necessary motion to either of the shafts E′, F′, $G^2$, or $G^3$, we prefer the device shown in Figs. 3 and $3^a$. On either of the shafts mentioned is secured by a key a clutch K, having a cam-face adapted to be engaged by a correspondingly-shaped cam-face formed on a hub K′, extending from a sprocket-wheel $K^2$, connected by a sprocket-chain or other means with the machinery for imparting motion to the elevator. This sprocket-wheel $K^2$ is mounted to rotate loosely on the shaft and is provided with the reduced hub $K^3$, pressed on by a spring L, coiled on the shaft and pressed on by a sleeve N. By this construction the clutch is rendered automatic and all danger of breakage of the parts of the machinery avoided. The sleeve N is preferably formed of two parts $n$ and $n'$, the part $n$ being free to slide on the shaft and the part $n'$ being secured thereto by set-screws N′. A shifting fork O, pivoted at O′ on an arm $O^3$, engages the part $n$ of the sleeve N, so that by the operator pressing the shifting fork O in the direction to cause the part $n$ of the sleeve N to be moved on the shaft toward the sprocket-wheel the part $n'$ of the sleeve can be adjusted on the shaft to put the spring under the desired tension. In order to hold the part $n$ of the sleeve pressed toward the sprocket-wheel $K^2$ while the part $n'$ is being adjusted on the shaft, we provide a notched segment P, with which the outer end of the shifting fork O is made to engage, so that it will be locked in the position to which it has been moved. The fulcrum O′ of the said shifting fork O can be changed to a point $O^2$ on the bar $O^3$, so that the said shifting fork may be engaged with the reduced hub $K^3$ to move the sprocket-wheel $K^2$ temporarily out of frictional engagement at its hub K′ with the transmitting-clutch K.

In order to insure proper working of the elevator, we provide elevator sprocket-chains D, having undetachable links and shown in Figs. 4 to 8, and arranged to prevent the links from coming apart accidentally and to maintain its strength and durability when run either side up.

As illustrated in Figs. 4, 5, and 6, we form the chain D with plain links D′, loop-links $D^2$, and bracket-links $D^3$, of which the link $D^2$ is formed on both of its ends with the integral loops $D^4$, each engaging the plain end of the next adjacent link D′ or $D^3$. Each of the bracket-links $D^3$ has one side $D^5$ set outward out of alinement with the corresponding side of the other links, and this side $D^5$ is in cross-section either round, as shown in Figs. 4 and 5, or square, as shown in Figs. 4 and 6. The supporting T-bracket C′ for the bucket C is looped onto this side $D^5$ and extends transversely, and is flexible on the round side $D^5$ (see Fig. 5) and rigid on the square side $D^5$, Fig. 6. By setting the sides of the links outward the portions of the brackets secured thereto compensate for the same, that is to say, they fill up the space on the inside of the links formed by the set-out portion so as to have the same room in the link for the teeth of the sprocket-wheels as is in the other links. The bucket C is riveted or otherwise fastened to the brackets.

In case the chain is to be shortened, say, a single link, then a loop-link $D^2$ is removed and the now adjacent plain ends of the disconnected links are united by a loop $D^6$, as plainly shown in Figs. 7 and 8. The chain can be lengthened by adding plain and loop links. The extra loop-links for lengthening are left sufficiently open at the loops so that they can be readily attached.

The integral loops are closed sufficiently over the respective plain ends to prevent the latter from becoming accidentally disengaged, and in case a link should break it can be readily replaced by a new one. Furthermore, a chain of this construction can be run in either direction without danger of disconnecting the links. It is understood that a chain belting, as described and composed of

about one-half plain links made heavy at the ends, will stand considerable wear, especially as the loops and ends are of the same thickness and the chain can be used equally well on either side.

Having thus fully described our invention, we claim as new and desire to secure by Letters Patent—

1. A grain-elevator provided with an elevator-casing containing the usual elevating-buckets, and comprising a grain-receiving compartment, and relief-chambers on opposite sides of the said compartment and each having an inlet and an outlet gate, substantially as shown and described.

2. A grain-elevator comprising sprocket-chains carrying buckets, a casing in which move the said chains and buckets, a grain-receiving compartment formed in the lower part of the said casing, relief-chambers on opposite sides of the said compartment, and inlet and outlet gates for each of the said chambers, to connect the interior of the chambers with the receiving-compartment, substantially as shown and described.

3. A grain-elevator comprising a casing containing elevator-chains carrying buckets passing over sprocket-wheels, and a second set of sprocket-wheels for tightening or loosening the said chains, pivoted arms carrying the shaft of the said second set of sprocket-wheels, and adjustable links connected with the said arms, substantially as shown and described.

4. In a grain-elevator, the combination with a casing having an outlet-chute, of a riddle onto which discharges the said chute, links suspending one end of the riddle, levers suspending the other end of the riddle, and means for oscillating the riddle, substantially as described.

5. A grain-elevator provided with a drum, over which pass the grain-carrying buckets, the said drum being provided with flanges having pockets opening at their inner ends into transverse pockets formed in the periphery of the drum, substantially as shown and described.

6. A grain-elevator provided with a drum formed on its periphery with transverse pockets, sprocket-wheels held on the said drum and forming underflow-spaces with the said pockets, and flanges held on the ends of the drum next to the said sprocket-wheels, the said flanges being formed on their inner faces with pockets opening into the said underflow-spaces, substantially as shown and described.

7. A grain-elevator provided with a clutch mechanism for the driving-shaft, comprising a clutch secured to the shaft and having a cam-face, a driving sprocket-wheel mounted to turn loosely on the said shaft and having a cam-face to engage the cam-face of the said clutch, a spring pressing on the hub of the sprocket-wheel and holding its cam-face in engagement with the cam-face of the clutch, a two-part sleeve, one part of which is movably mounted on the shaft and the other adjustably secured to said shaft, and a shifting fork engaging the movably-mounted part of the sleeve, whereby the clutch is rendered automatic and provision made for adjusting the tension of the spring, substantially as described.

8. A grain-elevator provided with a clutch mechanism for the driving-shaft, comprising a clutch secured to the shaft and having a cam-face, a driving sprocket-wheel mounted to turn loosely on said shaft and having a cam-face engaging the cam-face of the said clutch, a spring pressing on the hub of the said sprocket-wheel, a two-part sleeve, one part of which is movably mounted on the shaft, and the other adjustably secured to said shaft, a shifting fork engaging the movable part of the sleeve, and a notched segment with which the shifting fork is adapted to be engaged, whereby provision is made for temporarily holding the movable part of the sleeve in the position to which it has been moved by the shifting fork while the other part of the sleeve is adjusted on the shaft to regulate the tension of the spring, substantially as described.

9. An elevator sprocket-chain, comprising connecting-links and bracket-links connected with each other, the bracket-links each having one of its sides offset laterally out of alinement with the corresponding sides of the links, the said offset portion of the side of the link serving to receive a bucket-bracket, substantially as described.

10. An elevator sprocket-chain, comprising connecting-links, and bracket-links connected with each other by integral loops engaging plain ends of the adjacent links, each bracket-link having one of its sides projected laterally out of alinement with the corresponding sides of the links, and side connections fitting on the laterally-projecting portions of the sides and adapted to compensate therefor, substantially as described.

11. An elevator sprocket-chain, comprising connecting-links, and bracket-links connected with each other by integral loops engaging plain ends of adjacent loops, each bracket-link having one of its sides projected laterally out of alinement with the corresponding sides of the links, the said set-out sides of some of the bracket-links being round and the remainder square, and bucket-brackets fitting on the laterally-projecting portions of the sides and compensating therefor, substantially as described.

12. In a grain-elevator, the combination with a casing having an outlet-chute, an endless elevator-chain and a tension-wheel engaging said chain, of a riddle suspended at the mouth of the outlet-chute and means for oscillating the riddle from the tension-wheel, substantially as described.

13. In a grain-elevator, the combination with a casing having an outlet-chute, an endless sprocket elevator-chain, and a sprocket-

wheel engaging the chain and serving as a tension-wheel, of a riddle, links suspending one end of the riddle, levers suspending the other end of the riddle, and links connecting the levers with cranks on the said sprocket-wheel shafts, substantially as described.

14. In a grain-elevator, the combination with an endless sprocket-chain provided with buckets, of pivoted arms, sprocket-wheels arranged adjacent to the sprocket-chain and engaging the same, and means for adjustably supporting the free ends of the said arms, substantially as described.

15. A grain-elevator comprising a casing having a receiving-compartment at its lower end, and a discharge-chamber at its upper end, the compartment and chamber being connected by a vertically-disposed leg, an endless chain of buckets mounted in the casing, relief-compartments one on each side of the receiving-compartment and having an inlet and outlet communicating therewith, and an oscillating screen at the outlet of the discharge-chamber, substantially as herein shown and described.

JAMES D. REAM.
MOSES LEWIS.

Witnesses:
E. P. CAMPBELL,
JAMES LEDWICH.