(No Model.) 3 Sheets—Sheet 1.

A. MacD. LOCKHART.

THRASHING MACHINE.

No. 519,609. Patented May 8, 1894.

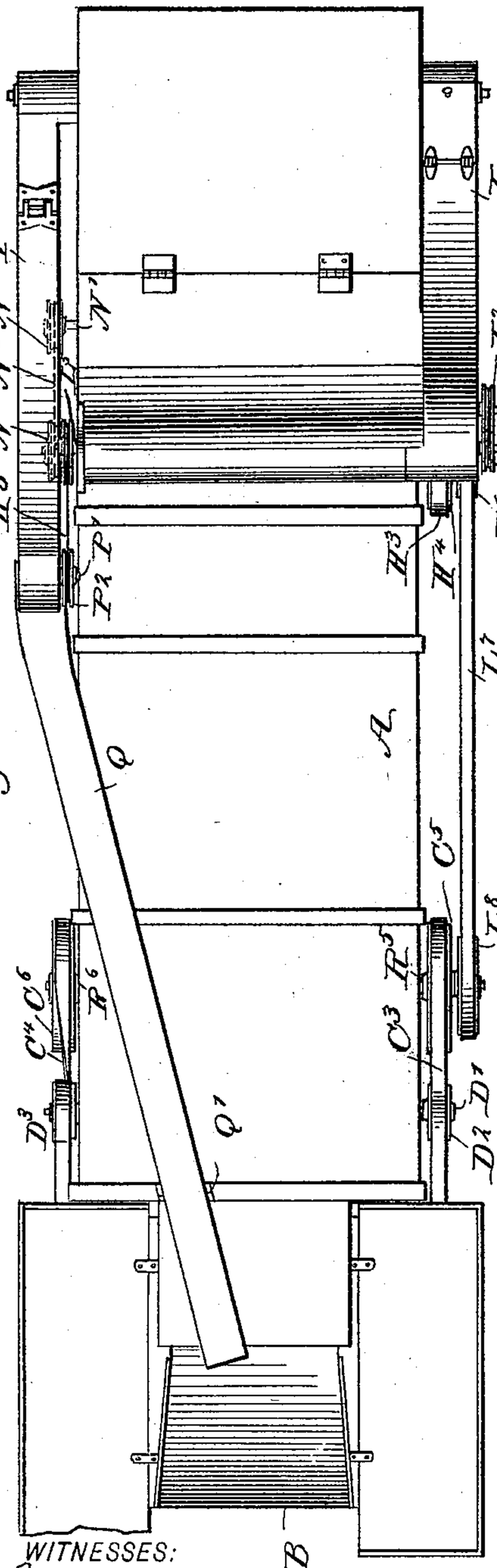


Fig. 1.

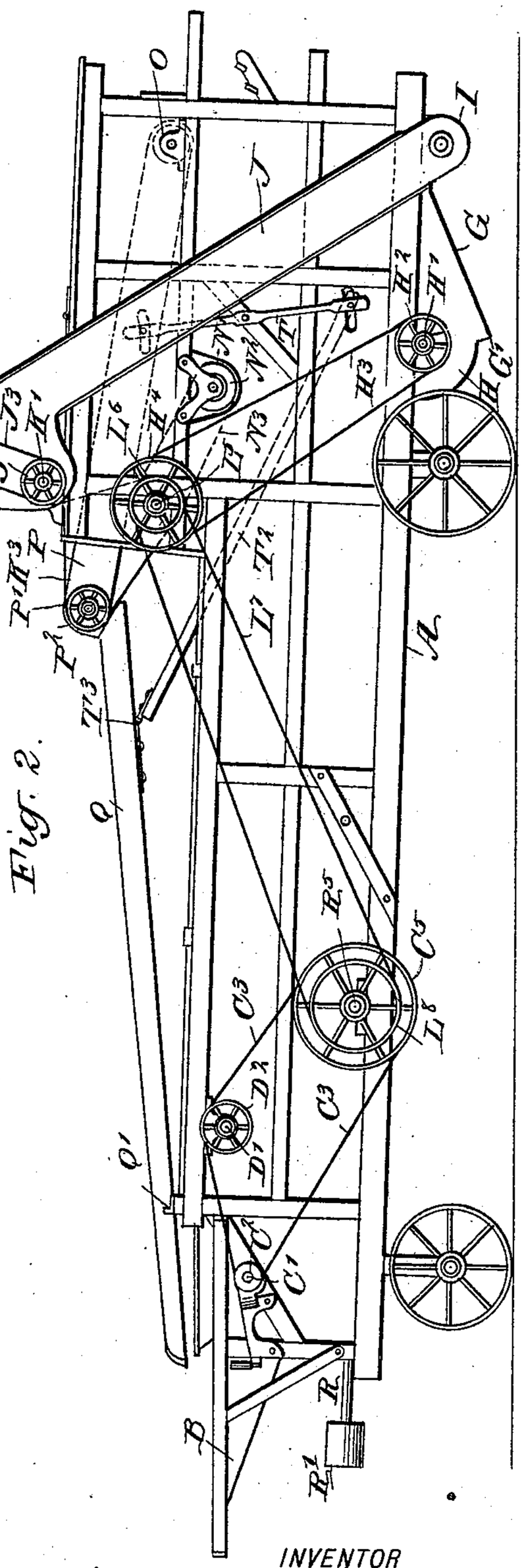


Fig. 2.

WITNESSES:

Paul Johnston

C. Sedgwick

INVENTOR

Alexander MacD. Lockhart

BY

Munn & Co

ATTORNEYS.

THE NATIONAL LITHOGRAPHING COMPANY,
WASHINGTON, D. C.

(No Model.) 3 Sheets—Sheet 2.

A. MacD. LOCKHART.

THRASHING MACHINE.

No. 519,609. Patented May 8, 1894.

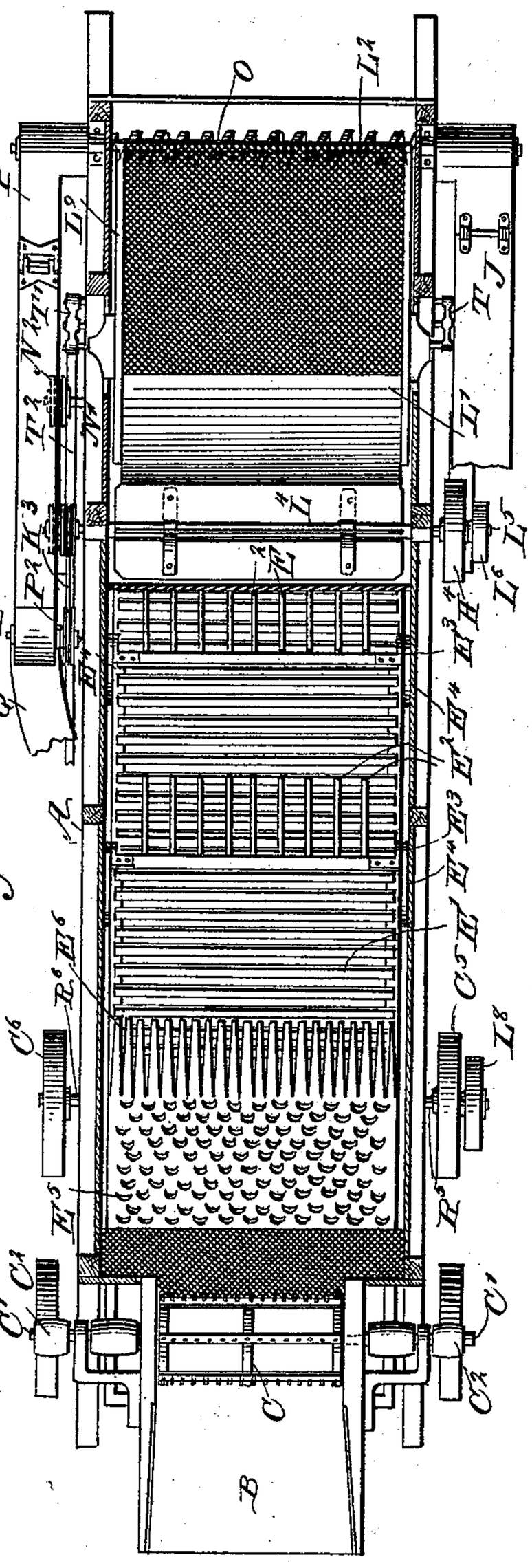


Fig. 3.

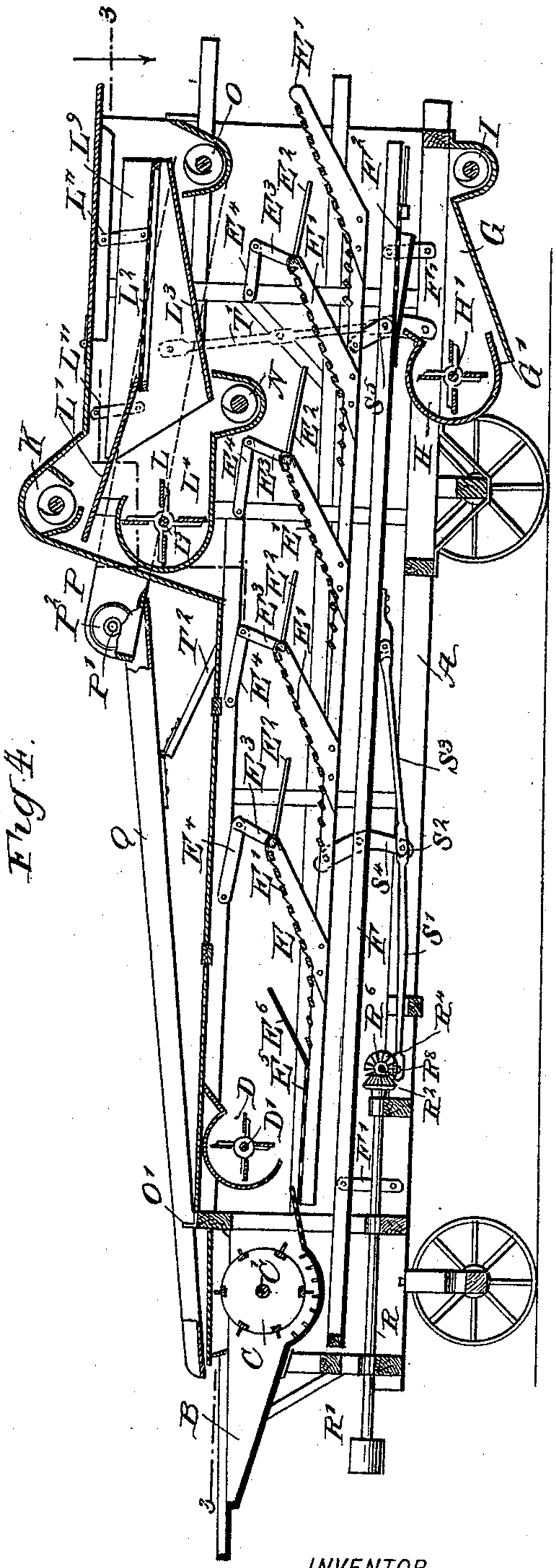


Fig. 4.

WITNESSES:

Paul Jakel

C. Sedgwick

INVENTOR

Alexander MacD. Lockhart

BY

Munn & Co

ATTORNEYS.

THE NATIONAL LITHOGRAPHING COMPANY,
WASHINGTON, D. C.

(No Model.) 3 Sheets—Sheet 3.

A. MacD. LOCKHART.

THRASHING MACHINE.

No. 519,609. Patented May 8, 1894.

Fig. 5.

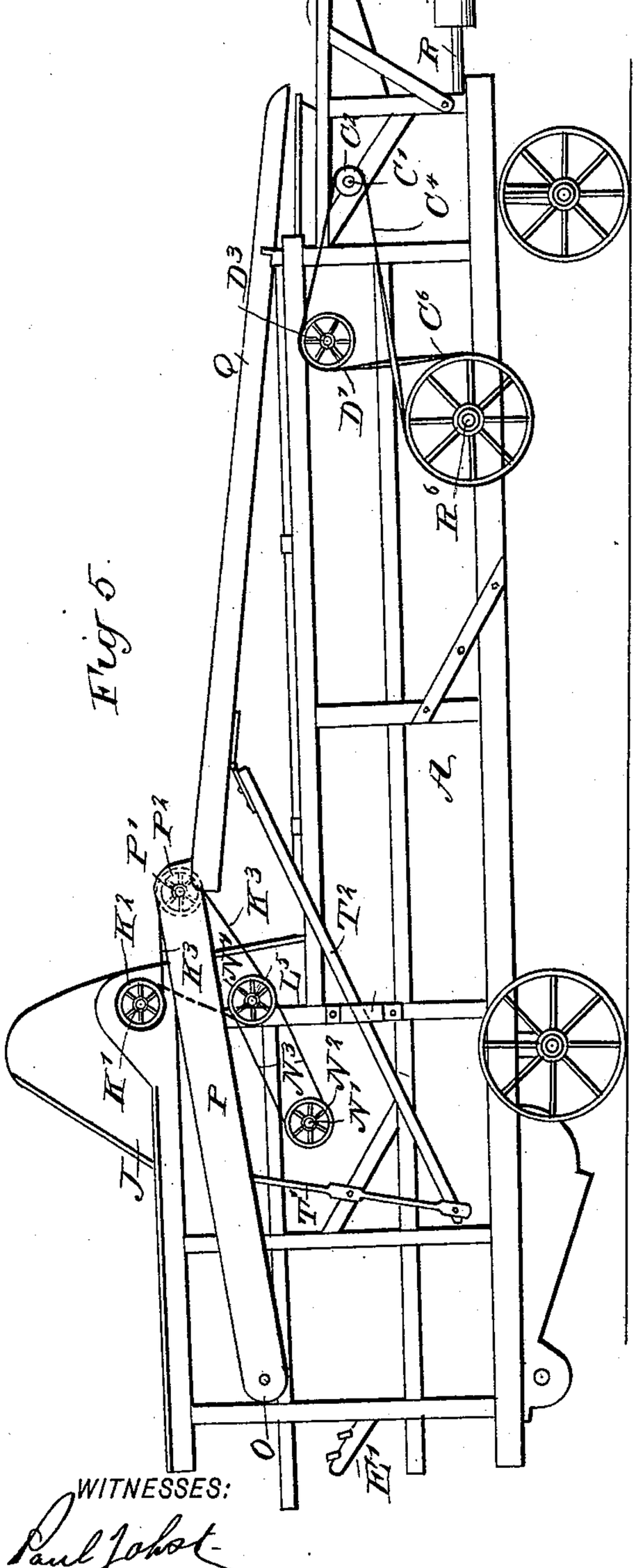
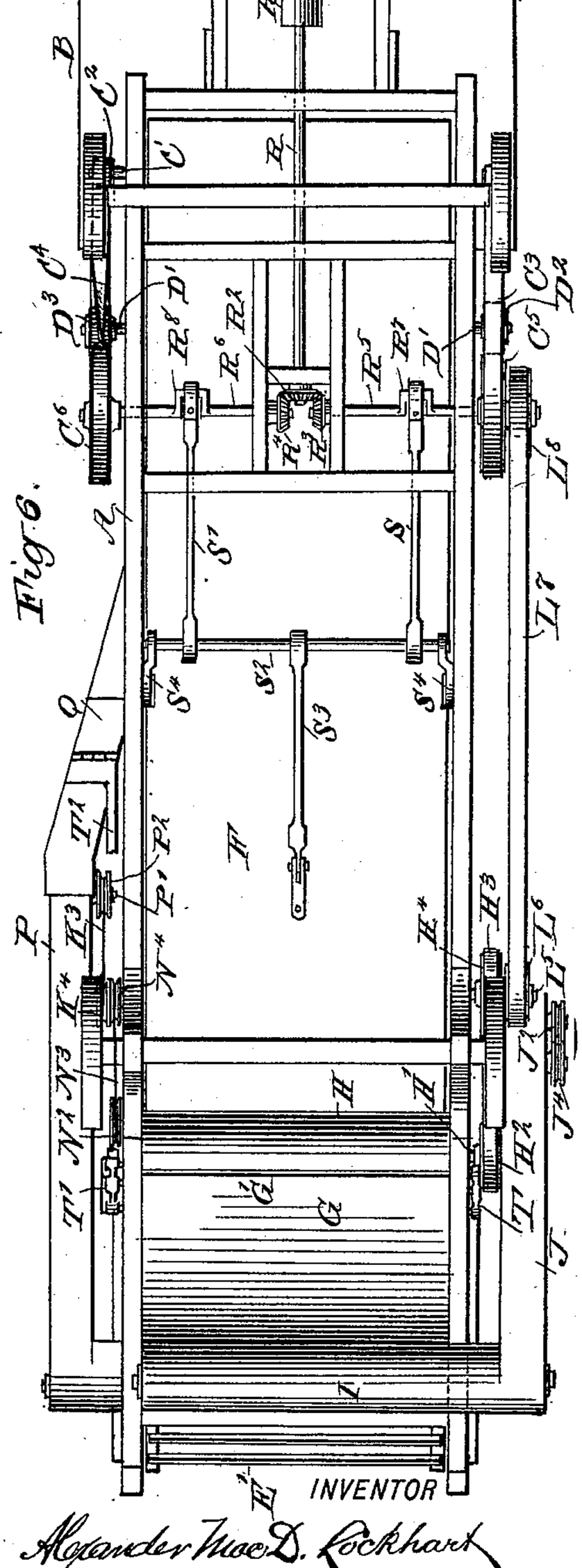


Fig. 6.



WITNESSES:

Paul Johot

C. Dodgeview

INVENTOR

Alexander MacD. Lockhart

BY Munn & Co

ATTORNEYS.

THE NATIONAL LITHOGRAPHING COMPANY,
WASHINGTON, D. C.

UNITED STATES PATENT OFFICE.

ALEXANDER MACDONALD LOCKHART, OF MITCHELL, SOUTH DAKOTA.

THRASHING-MACHINE.

SPECIFICATION forming part of Letters Patent No. 519,609, dated May 8, 1894.

Application filed October 3, 1893. Serial No. 487,075. (No model.)

To all whom it may concern:

Be it known that I, ALEXANDER MACDONALD LOCKHART, of Mitchell, in the county of Davison and State of South Dakota, have invented a new and Improved Thrashing-Machine, of which the following is a full, clear, and exact description.

The object of the invention is to provide a new and improved thrashing machine, which is comparatively simple and durable in construction, very effective in operation and arranged to completely separate the grain from the chaff.

The invention consists principally of an elevator for raising the chaff into a conveyer, discharging into a fanning mill, which discharges the heavy chaff into a conveyer connected with a second elevator, discharging into a return spout for carrying the chaff back to the thrasher cylinder.

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 plan view of the improvement. Fig. 2 is a side elevation of the same. Fig. 3 is a sectional plan view of the same on the line 3—3 of Fig. 4. Fig. 4 is a sectional side elevation of the improvement. Fig. 5 is a side elevation of the same, the opposite of that shown in Fig. 2; and Fig. 6 is an inverted plan view of the improvement.

The improved thrashing machine is provided with a suitably-constructed frame A supporting at its front end, the usual feed table B, leading to the cylinder C in the rear of which is arranged the beater D discharging like the cylinder, onto a shaking straw rack E, below which is arranged the pan F into which falls the grain and chaff, while the straw is carried rearwardly over the said straw rack. The grain pan F is mounted on links F′ and is inclined downwardly and rearwardly, the rear end being formed with a sieve F^2 discharging onto the inclined board G extending transversely and formed at its lower front end with a discharge spout G′ through which passes the grain cleaned by the fan H located in front and over the said board G, as plainly illustrated in Fig. 4.

The rear end of the board or table G discharges the chaff into a transversely-extending conveyer I which carries the chaff to the front side of the machine into the lower end of an elevator J of any approved construction and supported on the front side of the frame A. The upper end of this elevator J discharges into a transversely-extending conveyer K arranged on the top of the machine and discharging onto an inclined table L′ forming part of a fanning mill L, as plainly shown in Fig. 4.

The table L′ discharges onto the swinging sieve L^2 through which falls the grain onto the inclined board L^3 over which passes a blast of air from the fan L^4 of the winnower, so that the heavy chaff is separated from the grain which latter passes over the lower end of the board L^3 into a transversely-extending conveyer N discharging the grain on one side of the machine. The heavy chaff blown by the winnower fan L^4 back over the board L^3 falls into a transversely-extending conveyer O discharging at the rear side of the machine into an elevator P also of any approved construction and said elevator discharging at its upper end into a chute Q arranged on top of the machine and extending forward and downwardly to discharge the chaff back onto the feed table B, so as to cause the chaff to pass with the incoming new grain, to the cylinder C to be again subjected to the various operations until all the grain is finally obtained at either the spout G′ or the outlet of the conveyer N.

In order to impart movement to the several parts of the machine, I provide a main driving shaft R arranged longitudinally and journaled in suitable bearings in the front lower part of the main frame A. On the outer end of the shaft R is secured a pulley R′ connected by belt with a motor for setting the thrasher in motion. On the inner end of this shaft R is secured a bevel gear wheel R^2 in mesh on opposite sides with the bevel gear wheels R^3 and R^4 secured on the inner ends of shafts R^5 and R^6 respectively, mounted in suitable bearings and arranged transversely to extend to opposite sides of the machine; see Fig. 6. On the shafts R^5 and R^6 are formed the crank

arms R^7 and R^8 respectively, connected by links S, S', with a transversely-extending shaft or rod S^2 connected by a link S^3 with the under side of the grain pan F so that when the machine is set in motion, the crank arms R^7, R^8 of the revolving shafts R^5, R^6, impart by the links S, S', rod S^2 and link S^3, a forward and backward swinging motion to the said grain pan F. The shafts R^5 and R^6 also drive the cylinder C and beater D, and for this purpose the cylinder shaft C' is provided on its outer ends with pulleys C^2 over which pass the belts C^3 and C^4 passing over pulleys C^5 and C^6 respectively, secured on the said shafts R^5 and R^6 respectively. The said belts C^3 and C^4 also pass over pulleys D^2 and D^3 respectively, secured on the ends of the shaft D' carrying the beater D. As the shafts R^5 and R^6 revolve in opposite directions, the belt C^4 is crossed, as plainly indicated in Figs. 5 and 6, so that a uniform motion is transmitted from the said shafts to the cylinder C and beater D. The shaft R^5 also imparts motion to the mechanism in the rear part of the machine, and for this purpose, the shaft L^5 of the winnower fan L^4 is provided on its front end with a pulley L^6 over which passes a belt L^7 also passing over a pulley L^8 secured on the shaft R^5 next to the pulley C^5; see Figs. 1, 2 and 6. Thus the rotary motion of the shaft R^5 is transmitted to the fan L^4 of the winnower L to rotate the said fan in the proper direction for the purpose previously described. The shaft L^5 of the winnower fan L^4 drives the fan H and for this purpose, the shaft H' of the said fan H carries at its front end a pulley H^2 over which passes a belt H^3 also passing over a larger pulley H^4 secured on the said shaft L^5. The shaft L^5 also transmits motion to the conveyer N and for this purpose, the shaft N' of the said conveyer is provided at its rear end with a pulley N^2 over which passes a belt N^3 also passing over a pulley N^4 secured on the rear end of the said shaft L^5. The shaft L^5 also transmits motion to the conveyer K and for this purpose the shaft K' of this conveyer is provided at its rear end with a pulley K^2 over which passes the cross belt K^3 also passing over a pulley K^4 (see Figs. 1, 3 and 6), secured on the shaft L^5 in the rear of the pulley N^4. The said belt K^3 also passes over a pulley P^2 secured on the shaft P' of the upper roller for the elevator P. The front end of the shaft K' of the conveyer K imparts motion to the elevator J and for this purpose, the upper roller shaft J' for the said elevator is provided with a pulley J^2 over which passes a belt J^3 also passing over a pulley J^4 attached to the front end of the conveyer shaft K', as plainly illustrated in Fig. 2. It is understood that the motion of the elevator J transmits motion to the conveyer I, as the shaft of the latter forms the shaft for the lower roller of the said elevator J. In a like manner the movement of the elevator P actuates the conveyer O as the shaft of the latter forms the shaft for the lower roller of the said elevator P.

In order to impart a swinging motion to the straw rack E, I connect the outer ends of the rod S^2 previously mentioned with levers S^4 pivoted on the sides of the frame A and pivotally connected with the sides of the said straw rack E, as plainly illustrated in Figs. 4 and 6. Links S^5 pivoted on the sides of the frame are pivotally-connected with the rear end of the straw rack E so that when a rocking motion is given to the levers S^4, the said links S^5 swing so that the entire rack E is moved forward and backward. The rear links S^5 are pivotally-connected at or near their middle with levers T, T', fulcrumed on the sides of the frame A and pivotally connected with the shoe L^9 of the fanning mill L carrying the sieve L^2 and the board L^3 previously described. The said shoe L^9 is hung on links L^{11} pivoted on the frame A, as plainly illustrated in Fig. 4. Thus, the swinging movement of the links S^5 is transmitted by the levers T, T', to the riddle L^9 so as to impart a swinging motion to the latter and to the sieve L^2 and board L^3 for the purpose previously described. The lever T' is pivotally-connected by a link T^2 with the bottom of the chute Q near the upper rear end thereof at T^3 so that a forward and backward sliding motion is given to the said chute to shake the material discharged into the elevator P downward, so as to cause the said material to finally pass onto the feed table B. The front end of the chute Q is fitted to slide in suitable berings Q' arranged on the top of the main frame A. The straw rack E previously mentioned is provided with a slatted bottom made in sections, from each of which extends an upwardly and rearwardly inclined slatted extension E' over which the straw has to pass in its rearward movement. On the upper end of each extension E' is pivoted a rake E^2 provided on its pivot end with an upwardly extending arm E^3 pivotally-connected by a link E^4 with the main frame, so that when a rocking motion is given to the straw rack E, the links E^4 will impart rocking motion to the arms E^3 and consequently to the rakes E^2 on the forward and backward movement of the extension E'. Now, it will be seen that the straw passing up one extension E' passes onto the corresponding rearwardly-extending rake E^2 from which it is discharged onto the next following slatted section, from which it travels up on its extension and so on until the straw is finally discharged over the rearmost extension E', which latter is not provided with a rake, as illustrated in Fig. 4. By this arrangement the straw is very thoroughly agitated, so that chaff, grain and other valuable material will fall through the slatted sections into the grain pan F. The front of the straw rack E is provided with a perforated bottom E^5 from the rear end of which extends upwardly and rearwardly, a rigid comb E^6 which discharges onto the first slatted section; see Fig. 4.

The operation is as follows: When the main

driving shaft R is set in motion rotary motion is given to the shafts R^5 and R^6, so that the latter rotate in opposite directions and the said shafts impart a rotary motion to the cylinder C and drum D while the shaft R^5, in addition, imparts rotary motion by the mechanisms above described, to the fan L^4 of the winnower L, the fan H, the several conveyers and elevators, as previously described. The shafts R^5 and R^6 also impart a swinging motion to the grain pan F and to the rake E, which, by its connection with the links E^4 causes the rakes E^2 to swing up and down for the purpose described. At the same time a forward and backward swinging motion is given to the chute Q by its connection with the lever T′ connected with one of the links S^5. Now when the machine is in motion the operator feeds the material over the table B to the cylinder C, from which it passes to the drum D and straw rack E, and over its rakes E^2 to be discharged finally at the rear end of the machine. The grain passes through the sieve E^5 and the slatted sections of the rack into the pan F, and along the same to the rear end thereof, to finally pass through the sieve F^2 onto the board G, while the coarser material passes over the rear lower end of the said pan into the conveyer I. The lighter material separated from the grain on the board G also passes by the action of the fan H into the conveyer I, which latter moves this material to the front side of the machine into the lower end of the elevator J which elevates the material and finally discharges it into the conveyer K which moves it transversely and through the opening in its bottom onto the feed table L′ to the sieve L^2 rocking with the riddle frame L^9. The grain passing through the sieve L^2 passes upon the board L^3 and is subjected to the action of the blast from the fan L^4 so that the lighter material is passed over the rear upper end of the said board into the conveyer O into which also passes the coarse material not sifted through the sieve L^2, but passing over the rear end thereof into the conveyer O. The grain passing down the board L^3 falls into the conveyer N which moves the grain to one side and discharges it at the front side of the machine. The material passing into the conveyer O is moved transversely to finally pass into the lower end of the elevator P to be elevated therein and finally discharged into the chute Q down which it passes to the front of the machine onto the table B, for re-introduction to the machine together with the additional grain regularly fed over the table, as above described.

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

1. In a thrashing machine, the oscillating straw-rack having a series of fixed, slatted extensions which project upward at an angle of about thirty degrees, and a series of oscillating rakes each of which is pivoted to the upper end of an extension, their teeth projecting rearward and vibrating vertically in the space between the extensions, links connected with the rakes, and means for oscillating the rack, as shown and described.

2. The combination with the rack having a series of slatted extensions, the rakes pivoted thereto and having links which connect them with the framing, of the fan arranged beneath said rack, pivoted levers connected with the rack, the transverse rod which connects the lower ends of said levers, and a link attached to the said rod and to the under side of the fan, as shown and described.

3. In a thrashing-machine, the combination, with the grain fan in rear end of the machine, the cylinder, the beater arranged contiguously, and the straw-rack and pan arranged longitudinally, one over the other, of the main driving shaft arranged longitudinally beneath the machine, two aligned crank shafts arranged at right angles to and geared with such main shaft, pulleys mounted on the outer ends of said crank-shafts, belts running on said pulleys and others on the shafts of the fan, thrashing cylinder and pan, and a lever and pitman connecting the crank shafts with the straw-rack and pan, respectively, as shown and described.

ALEXANDER MACDONALD LOCKHART.

Witnesses:
W. H. HELWIG,
ERNEST GOLDAMMER.