(No Model.) 6 Sheets—Sheet 1.

J. H. SPURGIN.

BAND CUTTER AND FEEDER FOR THRASHING MACHINES.

No. 388,595. Patented Aug. 28, 1888.

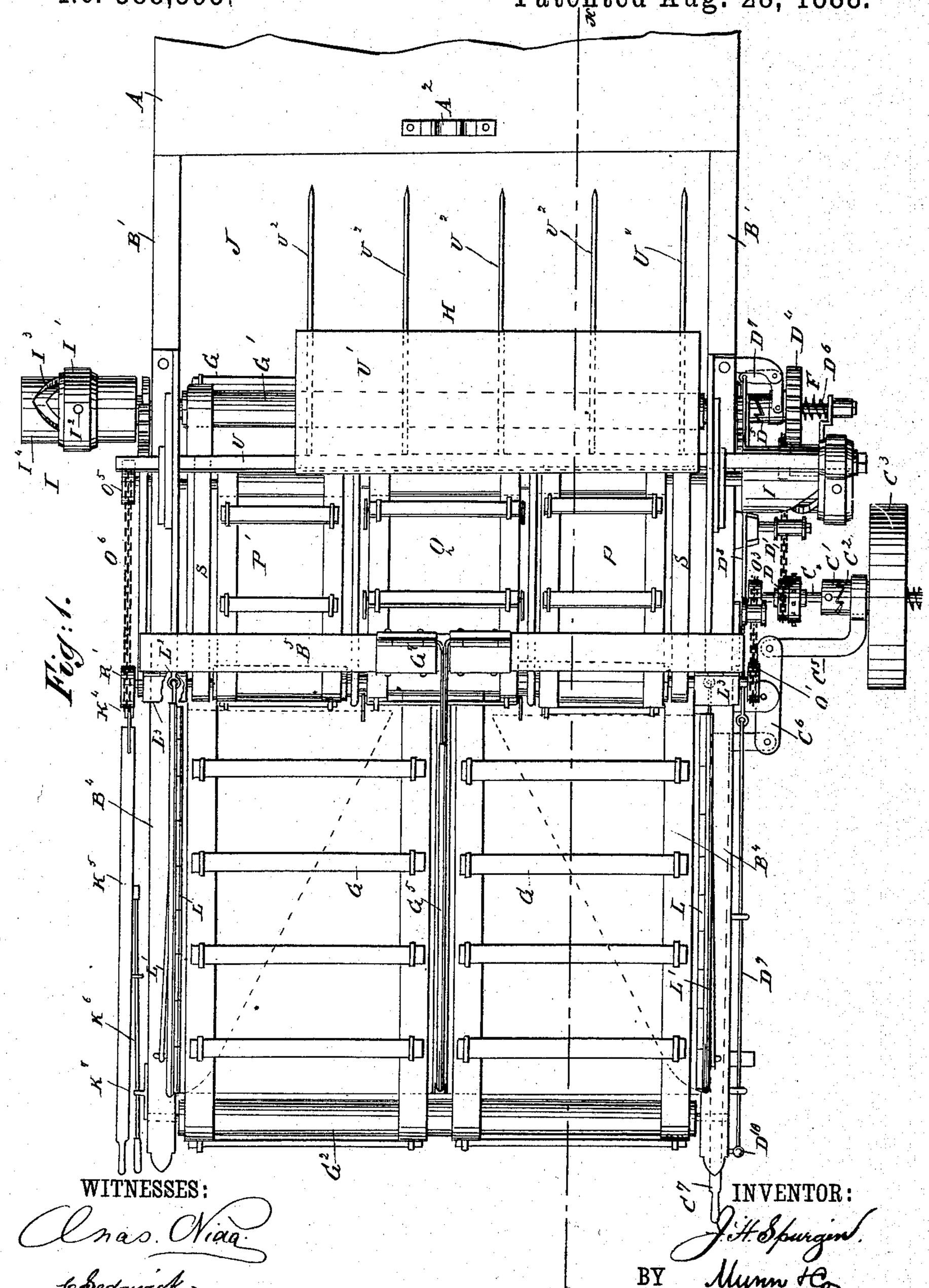

Fig. 1.

WITNESSES:

Chas. Neal

C. Sedgwick.

INVENTOR:

J. H. Spurgin.

BY Munn & Co

ATTORNEYS.

(No Model.)

6 Sheets—Sheet 2.

J. H. SPURGIN.

BAND CUTTER AND FEEDER FOR THRASHING MACHINES.

No. 388,595. Patented Aug. 28, 1888.

Fig. 1.

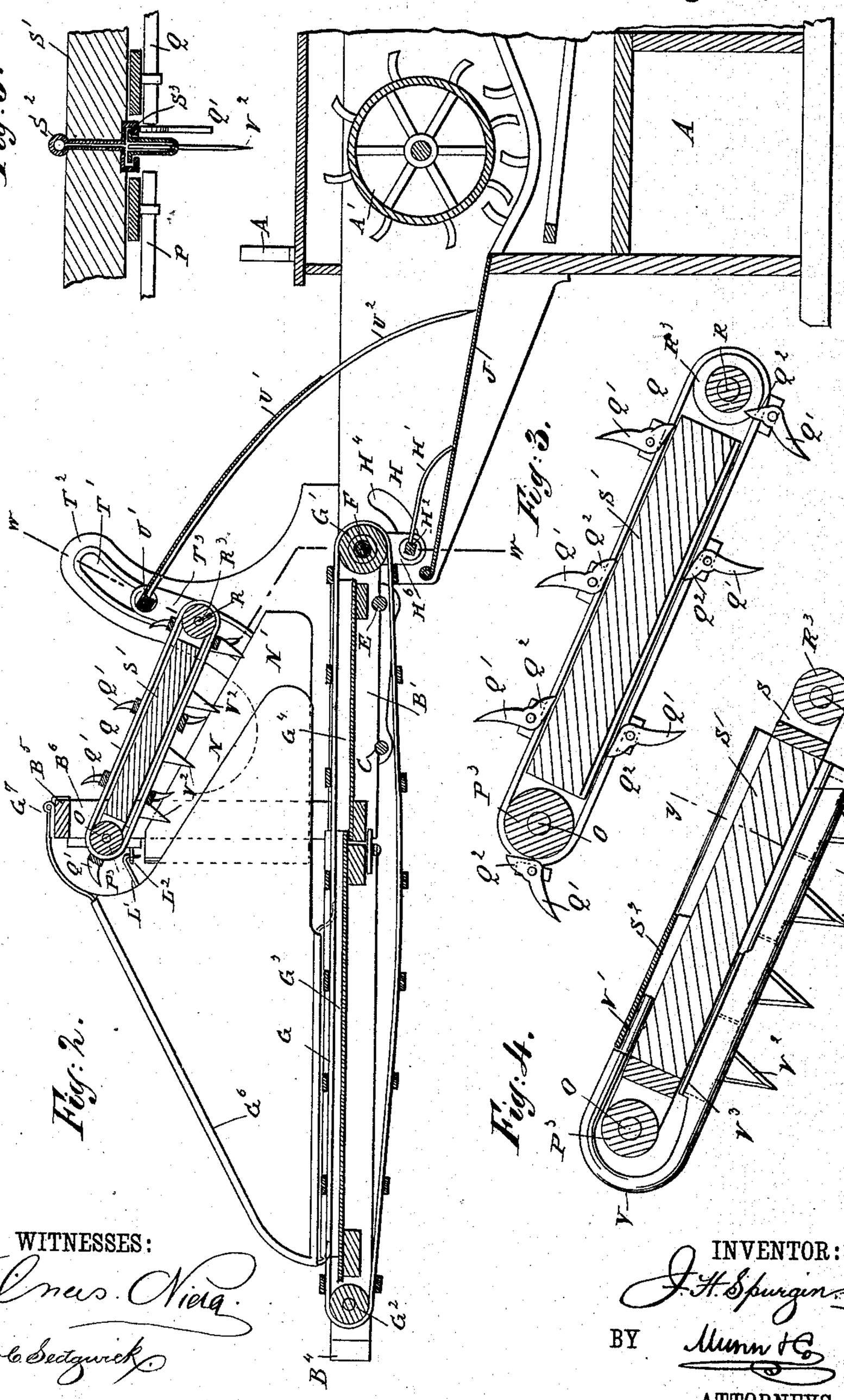

Fig. 3.

Fig. 2.

Fig. 4.

WITNESSES:

Chas. Nield.

C. Sedgwick.

INVENTOR:

J. H. Spurgin

BY Munn & Co

ATTORNEYS.

(No Model.) 6 Sheets—Sheet 3.

J. H. SPURGIN.

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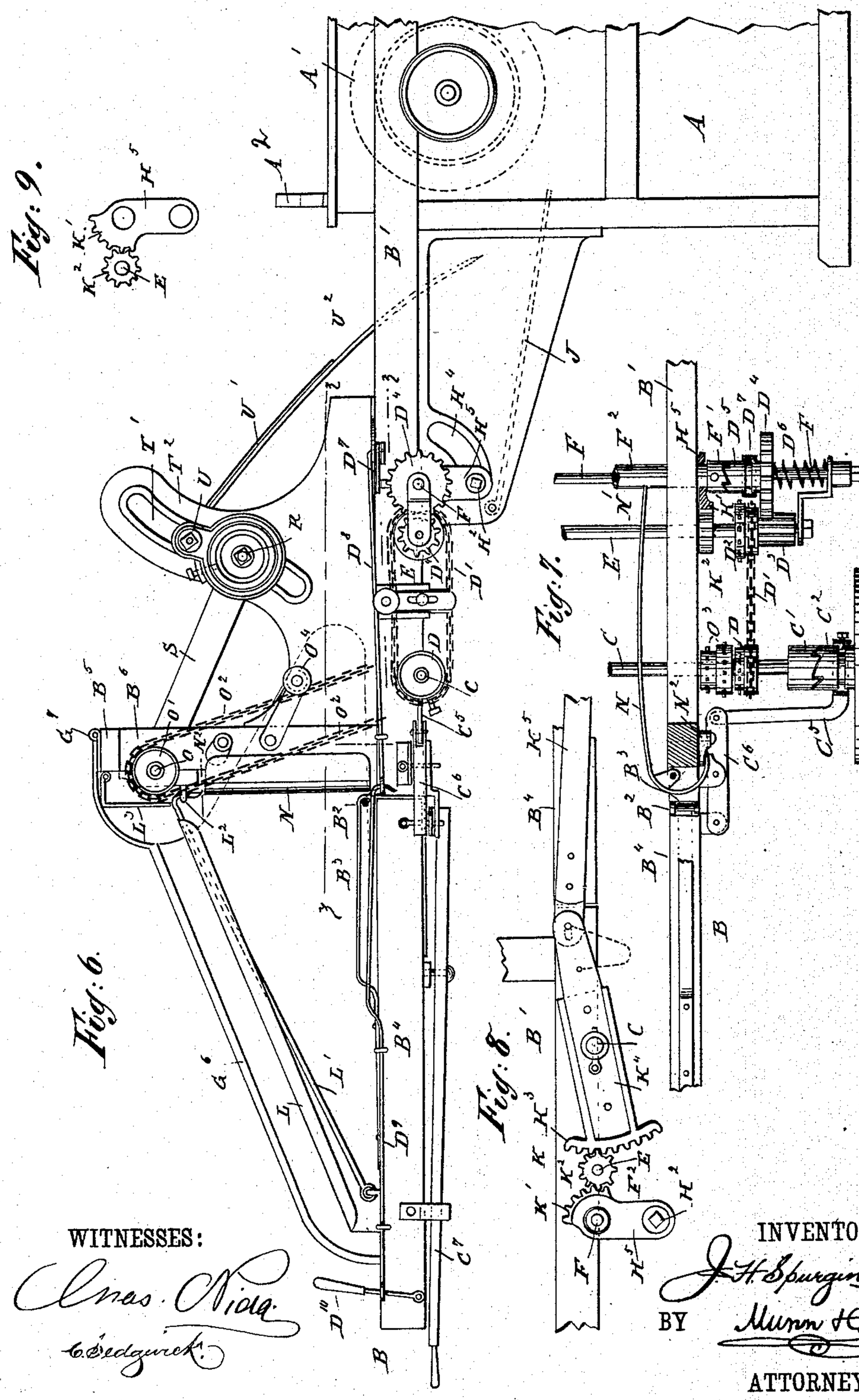


Fig. 9.

Fig. 7.

Fig. 6.

Fig. 8.

WITNESSES:

Chas. Viola.

C. Sedgwick.

INVENTOR:

J. H. Spurgin.

BY Munn & Co.

ATTORNEYS.

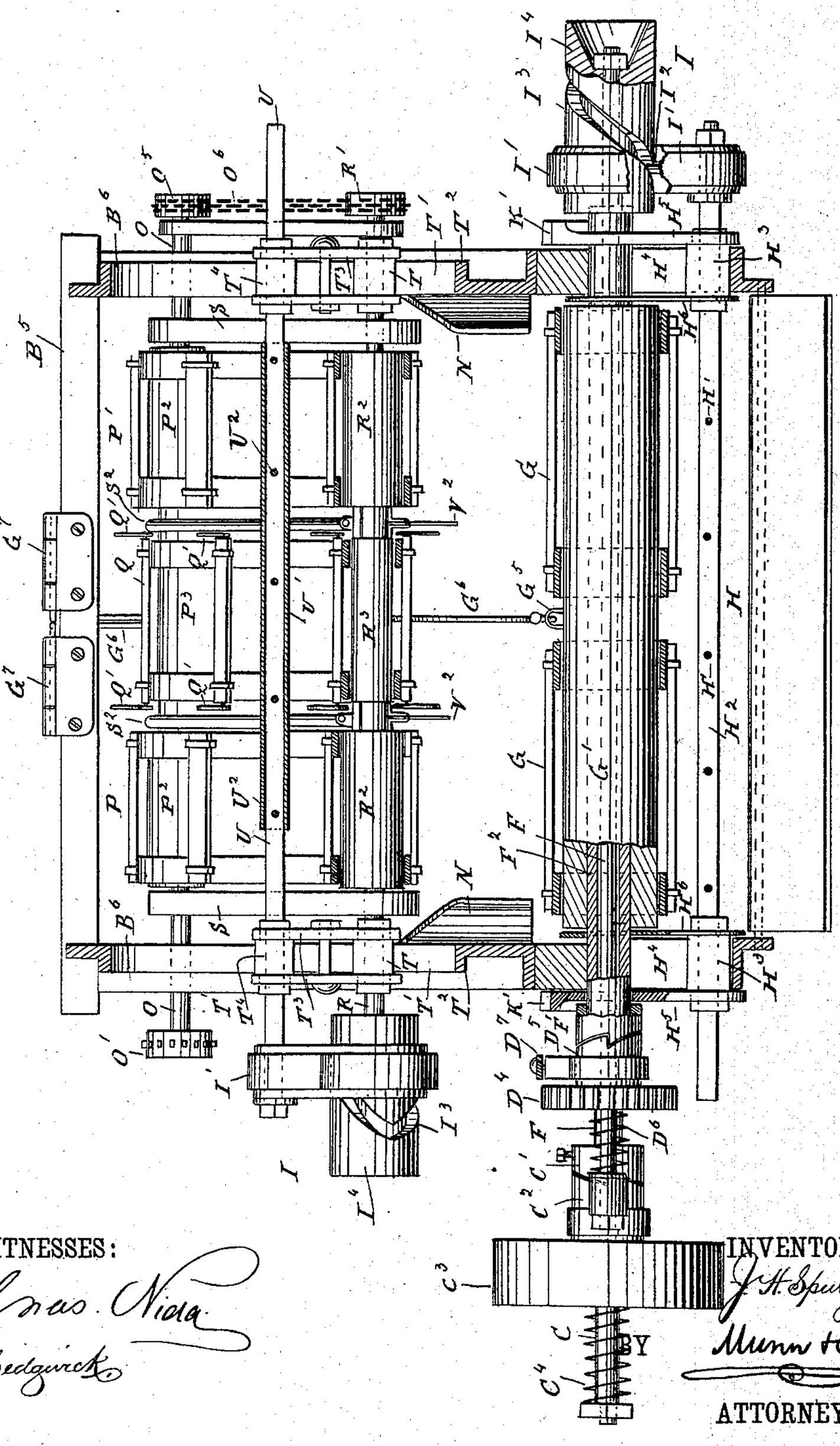
(No Model.) 6 Sheets—Sheet 4.

J. H. SPURGIN.

BAND CUTTER AND FEEDER FOR THRASHING MACHINES.

No. 388,595. Patented Aug. 28, 1888.

Fig. 10.



WITNESSES:

Chas. Nida.

C. Sedgwick.

INVENTOR:

J. H. Spurgin.

BY Munn & Co

ATTORNEYS.

(No Model.)

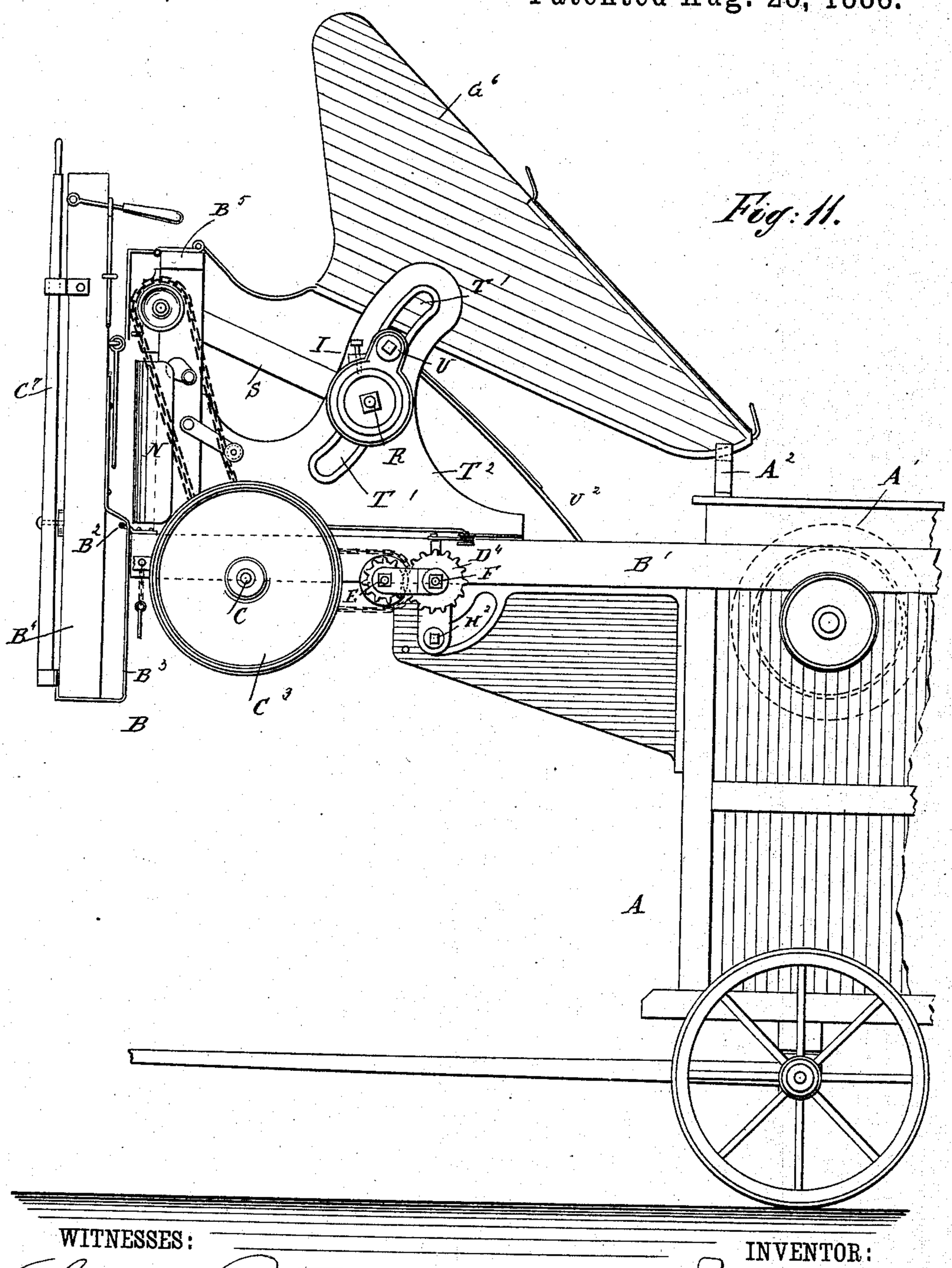
6 Sheets—Sheet 5.

J. H. SPURGIN.

BAND CUTTER AND FEEDER FOR THRASHING MACHINES.

No. 388,595. Patented Aug. 28, 1888.

Fig: 11.



WITNESSES:

Chas. Neal.

C. Sedgwick.

INVENTOR:

J. H. Spurgin.

BY Munn & Co.

ATTORNEYS.

(No Model.) 6 Sheets—Sheet 6.

J. H. SPURGIN.

BAND CUTTER AND FEEDER FOR THRASHING MACHINES.

No. 388,595. Patented Aug. 28, 1888.

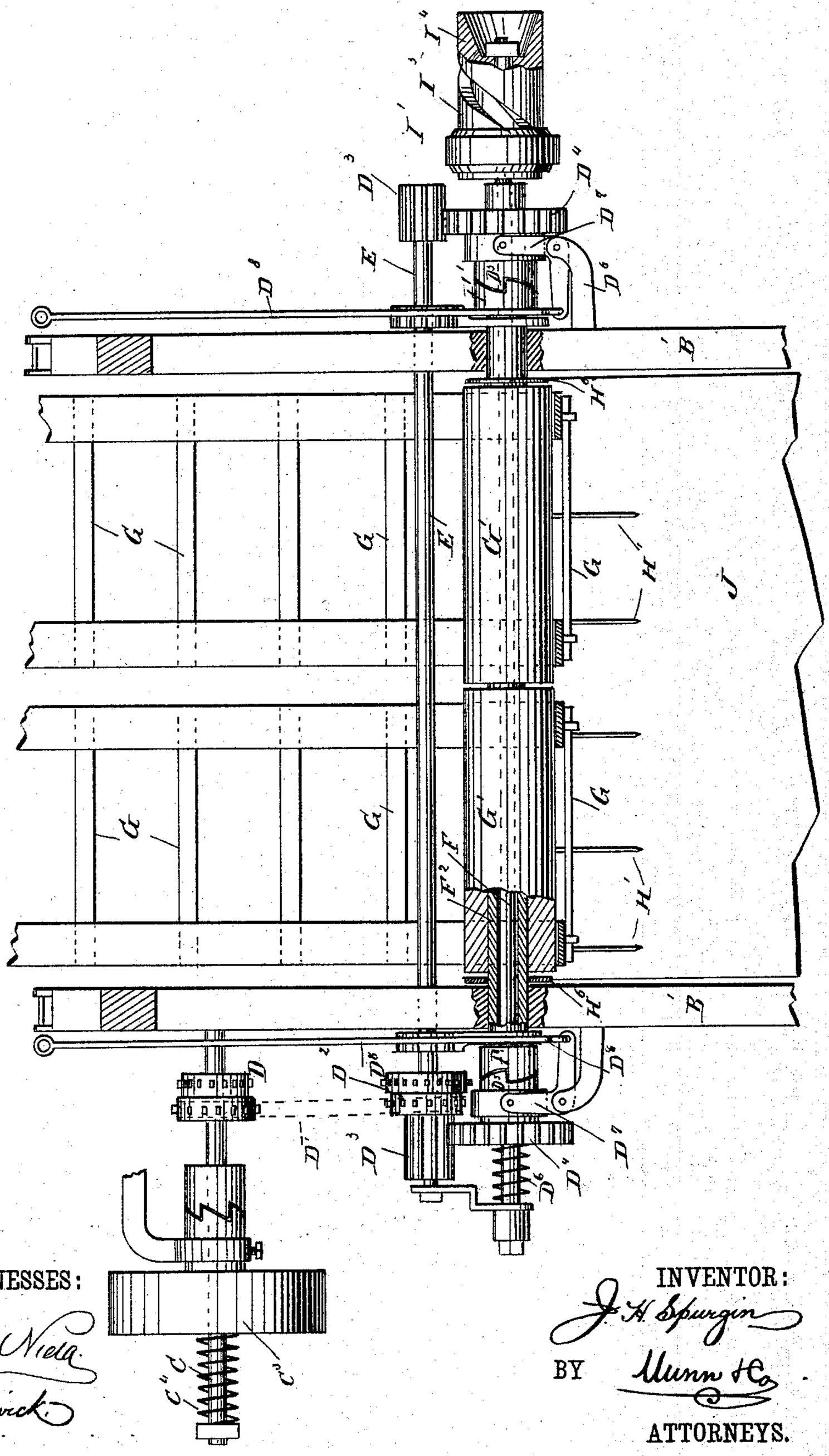


Fig. 1.

WITNESSES:

Chas. Nieda.

C. Sedgwick.

INVENTOR:

J. H. Spurgin

BY Munn & Co.

ATTORNEYS.

UNITED STATES PATENT OFFICE.

JOHN H. SPURGIN, OF CARTHAGE, MISSOURI.

BAND-CUTTER AND FEEDER FOR THRASHING-MACHINES.

SPECIFICATION forming part of Letters Patent No. 388,595, dated August 28, 1888.

Application filed October 27, 1887. Serial No. 253,508. (No model.)

To all whom it may concern:

Be it known that I, JOHN H. SPURGIN, of Carthage, in the county of Jasper and State of Missouri, have invented a new and Improved Band-Cutter and Feeder for Thrashing-Machines, of which the following is a full, clear, and exact description.

The object of my invention is to improve the machine for which Letters Patent No. 365,548 were granted to me on the 28th of June, 1887.

The invention consists in the construction and arrangement of various parts and details and combinations of the same, as will be fully described hereinafter, 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 my machine. Fig. 2 is a longitudinal sectional elevation of the same on the line *x x* of Fig. 1. Fig. 3 is an enlarged sectional elevation of one of the endless feeding-belts. Fig. 4 is a like view of the band-cutter. Fig. 5 is a cross-section of the same on the line *y y* of Fig. 4. Fig. 6 is a side elevation of my machine. Fig. 7 is a sectional plan view of part of the same on the line *z z* of Fig. 6. Fig. 8 is a side elevation of the shifting mechanism for the vibrator. Fig. 9 is a side elevation of a detail of the same. Fig. 10 is an enlarged vertical cross section of my machine on the line *w w* of Fig. 2, and Fig. 11 is a side elevation of my machine in a folded position. Fig. 12 is an enlarged sectional plan view of a modified form of my machine.

The thrashing-machine A, of any approved construction, is provided with the usual beating-cylinder, A′, and the side beams, B′, of the thrashing-machine are extended rearwardly, so as to form, with other parts presently to be described, the frame for the attachment.

On the outer end of each beam B′ is formed a pivot, B^2, which engages a recess formed by a band, B^3, secured to a side beam, B^4, so that the latter can be folded up when the attachment is not in use, as illustrated in Fig. 11. When the beams B^4 are swung up, the slots formed by the bands B^3 will allow the inner ends of the beams to slide below the beams B′, and as the bands abut against the ends of said beams B′ a lock-joint will be formed which will prevent the beams B^4 and their connected parts from being accidentally swung down.

On the side beams, B′, is mounted in suitable bearings the main shaft C, extending a short distance beyond each side beam and carrying on one side of one side beam, B′, a clutch, C′, engaging a similar clutch, C^2, formed on the hub of the main driving wheel C^3, mounted loosely on said shaft C, and connected by a belt or other means with one of the pulleys of the thrashing-machine A, so that when the latter is rotated the shaft C receives a similar motion. The clutch C^2 is held in contact with the clutch C′ by a spring, C^4, coiled on said shaft C and pressing against the driving-pulley C^3.

On the clutch C^2 is formed an annular groove, which is engaged by a forked end or ring formed on one end of a link, C^5, pivotally connected at its other end with a lever, C^6, fulcrumed on one of the side beams, B′. The other end of the lever C^6 is pivotally connected with one end of a lever, C^7, pivoted on the under side of the beam B^4 and extending to the outer end of the same, and carrying on this outer end a handle by which said lever C^7 is operated, so as to disengage, when deemed necessary, said clutch C^2 from the clutch C′, and whereby the shaft C is stopped from rotating.

On the main driving-shaft C is secured a double sprocket-wheel, D, over which passes a sprocket-chain, D′, also passing over a double sprocket-wheel, D^2, mounted to rotate loosely on a shaft, E, rotating in suitable bearings fastened to the under sides of the side beams, B′, said shaft E extending a short distance beyond each side beam, B′. The double sprocket-wheels D and D^2 enable me to change the speed of the shaft F.

On the outer face of the sprocket-wheel D^2 is formed a gear-wheel, D^3, which meshes into a gear-wheel, D^4, mounted to slide on and rotate with a shaft, F, passing through and having its bearings in the sleeve F^2, mounted to rotate in suitable bearings formed on the under sides of the side beams, B′.

On one end of the sleeve F^2 is formed a clutch, F′, engaging a similar clutch, D^5, formed on the inner face of the above-mentioned gear-

wheel D^4. A spring, D^6, coiled on said shaft F, presses against said gear-wheel D^4, so as to force its clutch D^5 into contact with the clutch F'.

On the clutch D^5 is formed an annular groove engaged by the forked end or ring held at one end of a bell-crank lever, D^7, connected at its other end with a link, D^8, extending longitudinally on said side beams, B', and provided at its other end with an eye engaged by the hook end of a link or rod, D^9, extending longitudinally in suitable bearings on the side beam, B^4, and connected at its outer end, near the end of said side beam, with a lever, D^{10}, fulcrumed on said side beam, D^4, and extending upward, as illustrated in Fig. 6. It will be seen that when the operator pulls on the lever D^{10} he disengages the clutch D^5 from the clutch F', whereby the sleeve F^2 ceases to rotate, while the shaft F keeps on revolving as said gear-wheel D^4 turns with said shaft and remains in mesh with the gear-wheel D^3.

On the sleeve F^2 is secured, between the side beams, B', a roller, G', over which pass two endless slat belts, G, also passing over the rollers G^2, mounted to rotate in suitable bearings at the outer ends of the side beams, B^4. The endless slat belts G pass, at their upper parts, over the tables G^3 and G^4, of which the table G^3 forms a connection between the side beams, B^4, and the table G^4 forms a rigid connection between the side beams, B'. The joint ends of the tables G^3 and G^4 are locked together by means of cleats or catches pivoted on the under side of the table G^3, as shown in Fig. 2. The endless slat belts G open at their inner ends on the distributing device H, consisting of a number of curved prongs, H', secured to a square bar or shaft, H^2, mounted to slide crosswise in bearings H^3, held adjustably in segmental slots H^4, formed in the side beams, B'. The bearings H^3 are each supported by the links H^5 and H^6, fulcrumed loosely on the sleeve F^2, and said links H^5 and H^6 are arranged on the inside and outside of each side beam, so as to prevent said bearings H^3 from leaving the slots H^4.

The square bar or shaft H^2, on which the prongs H' are secured, receives a crosswise motion by means of a shifting device, I, consisting of an arm, I', secured by one end to said bar or shaft H^2, and fitted to slide at its other end over a collar, I^4, secured on the shaft F on one side of the machine. Said arm I' is provided with a pin, I^2, engaging a slot, I^3, formed in the rim of said collar I^4, so that when the latter is rotated with the shaft F the pin I^2 moves forward and backward in said slot, thereby imparting by means of its arm I' a crosswise motion to said shaft H^2 and the prongs H'. The latter rest a little above, at their free ends, on a hinged plate, J, slightly inclined and resting with its free end at the mouth of the thrashing-machine, next to the feed-cylinder A', as shown in Fig. 2. The shaft or square bar H^2 can be raised or lowered, with its bearings H^3 in the slot H^4, by a shifting device, K, consisting of a segmental gear-wheel, K', formed on each link H^5 and meshing into pinions K^2, fastened on the transverse shaft E, above mentioned. One pinion, K^2, on one side of the shaft meshes into a segmental gear-wheel, K^3, formed on one end of the lever K^4, fulcrumed on the shaft C, and pivotally connected at its other end with a lever, K^5, fulcrumed on one side beam, B^4, and carrying at its outer end a hand-lever, K^6, adapted to engage a notched bar, K^7, extending vertically and secured near the outer end of the side beam, B^4.

Between the two endless slat belts G is formed a hollow ridge, G^5, secured to the table G^3. In this hollow ridge enter pins secured to the under side of a partition, G^6, pivoted at its upper end at G^7 to a cross-beam, B^5, secured to the uprights B^6, fastened near the outer ends and on top of the side beams, B'. The partition G^6 extends from near the outer end of the table G^3 to within a short distance of the inner end of the table G^4, as illustrated in Fig. 2. On the outer side of each slat belt G are pivoted to the side beams the guide-plates L, adapted to be fastened with part of their upper curved edges on a brace, L', pivoted at its lower end near the outer top end of each beam B^4 and fastened at its hooked upper end to an eye, L^2, secured to the side beams, B^6, above mentioned. The hooked end of each brace L' is held in place on the eye L^2 by an arm, L^3, hinged at its upper end to the cross-beam B^5 and extending downward, its lower end resting on the top of the hook end of each brace L', so that said hook end cannot disengage itself from its eye as long as said hinged arm remains in its downward position, as shown in Fig. 6.

The guide-plates L or leaves are triangular in shape and extend along the side beams, B^4, terminating a short distance before reaching the uprights B^6. On each of the latter is fulcrumed a guide-plate, N, extending inward and terminating with its curved end N' within a short distance of the inner end of the table G^4. Each of said hinged guide-plates N or leaves can be swung with its end N' toward or from the center of the table G^4 by a cam, N^2, pivoted on the outside of each upright B^6, and engaging the curved outer end of the pivoted plates N or leaves, as illustrated in Figs. 6 and 7.

Near the upper ends of the uprights B^6 is mounted in suitable bearings a transverse shaft, O, carrying on one outer end a sprocket-wheel, O', over which passes a sprocket-chain, O^2, also passing over a sprocket-wheel, O^3, secured to the main shaft C, so that when the latter is rotated said sprocket wheels and chains impart a rotary motion to said shaft O. Three endless slat belts, P, P', and Q, pass over their rollers P^2 and P^3, secured to said shaft O. Said slat belts also pass over similar rollers, R^2, R^2, and R^3, secured on a shaft, R, carrying on one outer end a sprocket-wheel,

R′, connected by a sprocket-chain, O⁶, with a sprocket-wheel, O⁵, secured on the other end of the shaft O, so that the rotary motion of the latter is imparted to said shaft R, whereby said slat belts P, P′, and Q receive a uniform motion over their respective rollers. The shaft R is mounted to rotate in the bearings T, held adjustably in slots T′, formed in a bracket, T², extending from the tops of the side beams, B′.

On each bearing T are secured arms T³, carrying a bearing, T⁴, through which passes a transverse square bar or shaft, U, on which is fastened between the brackets T² a shield or cover, U′, on which are held the prongs U², extending downward toward the plate J. The prongs U², the plate U′, and the shaft U, carrying the same, receive a crosswise motion by a shifting device, I, the same in the construction of its parts as the shifting device I above referred to in relation to the distributing device H. Said device I consists of the collar I⁴, which is secured on the shaft R, and is provided with the groove I³, engaging a pin secured on the arm I′, fastened on the said square shaft or bar U, so that when said shaft R is rotated the crosswise motion is imparted to said square bar or shaft U, as above described in reference to the distributing device H.

The shaft R is hung on two arms, S, fulcrumed on the shaft O near the inside of each upright B⁶, and the two arms S are connected with each other by a table, S′, over which pass said slat belts P, P′, and Q. The rollers P³ and R³, over which the slat belt Q passes, are somewhat smaller in diameter than the rollers P² and R², over which the slat belts P and P′ pass. This is done to accommodate the pushing-arms Q′, pivoted on each end of each slat of the slat belt Q. Each pushing-arm Q′ is provided with an inward extension or foot, Q², which rests on the table S′, while the respective slat passes over the latter, and thereby holds said pushing-arm Q′ in position. When the pushing-arm passes over the respective roller P³ or R³, then the foot Q² is disengaged, and said pushing-arm Q′ is free to turn with the motion of its respective slat.

It will be seen that the shaft R, with its connection, is free to move up and down in the slot T′, the lower half of which is segmental, having as a center the shaft O, while the upper part of said slot T′ is curved inward, and in this part moves the bearing T⁴, carrying the shaft U, so that the latter is slightly turned, whereby the plate U′ and the prongs U² are moved downward. The up-and-down motion of this shaft R is regulated by the amount of grain passing along the slat belts G; but I may employ a device similar to the device K, above mentioned, so as to adjust the relative position of the shafts R and Q in the slot T′.

On the table S′, between the slat belts P Q and P′ Q, is formed a guide, S², provided on top of the table S′ with a circular recess, into which fits the pin end V′ of a curved U-shaped bar, V, extending over and around the roller P³ and along the under side of the table S′, carrying on its lower edge, suitable distances apart, the V-shaped knives V², extending downward at their pointed ends. At the base of this part of the bar V is formed a slide, V³, passing into a guide, S³, connected with the guide S², above mentioned, and as illustrated in Fig. 5. The knives V² serve to cut the bands of the sheaves of grain, and the bar V, carrying said knives, can be removed from the table S′ by pulling said bar V outward, so that the pin V′ disengages the guide S² and the slide V³ disengages the guide S³.

The operation is as follows: When the machine is in the position shown in the drawings, with the exception of Fig. 11, then the sheaves of grain are thrown on the outer ends of the slat belts G in a longitudinal position, and said slat belts travel forward, receiving their motion from the thrashing-machine A, which is operated in the usual manner. The sheaves of grain travel forward on the slat belts G, being guided by the hinged guide plates or leaves N and the central partition, G⁶, toward and under the knives V², which cut the bands as the sheaves are held in position and carried forward by the pushing-arms Q′, secured to the slats of the slat belt Q, which, with the slat belts P and P′, rests at its lower end directly on the grain. After the bands are cut the grain travels forward still, and finally passes over the inner end of the slat belts G onto the prongs H′, which vibrate sidewise, thereby distributing the grain very equally on the pivoted plate J, which leads directly to the feeding-cylinder B′ of the thrashing-machine. The grain is prevented from passing upward before leaving the slat belts G by the plate U′ and the prongs U², secured to the latter and extending downward on said pivoted plate J, to assist in distributing the grain equally on the plate J before said grain enters the beating-cylinder A′. Said prongs U² and the plate U′ have a vibrating crosswise motion similar to that of the prongs H′. The devices for moving said prongs H′ and U² are of the same construction, and all the parts of the machine are operated with and from the thrashing-machine.

It will be seen that the operator can raise and lower the prongs H′ by pressing on the outer end of the lever K⁵, which has previously been disengaged by its hand-lever K⁶ from the notched arm K⁷. When the operator now presses on said lever, he causes a swinging motion of the lever K⁴, which, by its segment K³, imparts motion to the pinion K², and the latter imparts a swinging motion by the segment K′ to the arms H⁵, which carry the shaft H, on which said prongs H′ are fastened. Said shaft H, with its bearing H³, swings up or down in the segmental slot H⁴. By pressing on the lever D¹⁰ the operator can also stop the motion of the slat belts G in case too much grain is on the pivoted plate J, thus crowding the beating cylinder A′. The op-

erator interrupts the motion of the slat belts G by said lever D^{10} until the regular amount of grain passes through the cylinder A'. The operator is also enabled to stop the entire feeding mechanism by operating the lever C^7, which by its connections causes the clutch C^2 to disengage the clutch C', whereby the main driving-pulley C^2 is disconnected from the main driving-shaft C and the motion of the various parts of the machine ceases. It will be seen that the bands of the sheaves are cut at two places while passing over the slat belts G, and the continuous vibrating motion of the prongs H' and U^2 insures an equal distribution of the grain before it passes to the beating-cylinder A'.

Instead of using but one roller G' and two slat belts G, I may employ two rollers G', operating independently one from the other and each carrying its own slat belt, as illustrated in Fig. 12. The two rollers G' are mounted on separate sleeves turning on the inner shaft, F, and the sleeve to the left is connected with the mechanism hereinbefore described, while the other sleeve to the right is connected with a mechanism of exactly the same construction and connected and operated from the shaft E by a pinion, D^3. As this mechanism is the exact duplicate of the one on the other side of the machine, which is fully described, a further explanation is not deemed necessary. It will be understood that either of the two slat belts can be stopped and started independently of the other, the effect being to stop the feed on either side of the feeder in the event that the grain on either side of the feeder may be wet, and in this condition will require to be held back and the slat belt not allowed to feed too fast, as the thrashing-machine cannot thrash wet grain as fast as dry grain.

When the thrashing-machine, the feeder, and cutter are not in use, and the thrashing-machine is to be moved about, then the operator folds the feeder and band-cutter up against the thrashing-machine in the position illustrated in Fig. 11. In order to enable the operator to fold the feeder and cutter up, it is necessary to disconnect the slat belts G, which are provided with hooks or other suitable means for this purpose. After this the operator disconnects the lever C^6 from the lever C^7 by removing the pivotal pin, and the lever K^6 is similarly disconnected from the lever K^4. The operator then removes the pin ends of the partition G^6 and turns the same back over the feeder-table and swings the feeder upward and toward the thrashing-machine A until its free front end rests on a fork, A^2, secured to the top of the thrashing-machine A at its front end. The operator next swings the guide-plates N inward upon the disconnected slat belts G, after which the arms L^3 are swung upward, thus enabling the operator to disconnect the hook ends of the braces L' from the eyes L^2. The side beams, B^4, can now be turned on their pivots B^2, secured to the side beams, B', so that the side beams, B^4, assume a vertical position, after which the side beams, B^4, are let down, said pivotal points B^2 traveling in the slot formed by the bar B^3 until said pivotal points B^2 rest in the upper ends of said slots at each side of the machine. The different parts have now assumed the position shown in Fig. 11—that is, the entire feeder and band-cutter have been conveniently folded up on the thrashing-machine A, so that the latter can be moved about easily to any desired place, after which the several parts are again returned to their former positions by connecting the several parts again, as originally described.

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

1. In a band-cutter and feeder for thrashing-machines, the combination, with endless horizontal slat belts, of a vertical partition held between the said slat belts, a second set of endless slat belts held above the first named slat belts, a swinging table over which passes the last-named set of slat belts, fixed knives held on the under side of said table at each side of the partition, and pushing prongs or fingers secured to the ends of the slats of the central slat belt of the last-named set of slat belts, substantially as shown and described.

2. In a band-cutter and feeder for thrashing-machines, the combination, with endless slat belts traveling horizontally, of a vertical partition held between said slat belts, an inclined adjustable table held above said slat belts, an endless belt passing over said table and provided on the ends of each slat with a pushing prong or finger, and fixed knives held on the under side of said table alongside the said pushing prongs or fingers, substantially as shown and described.

3. In a band-cutter and feeder for thrashing-machines, the shaft O, carrying the rollers P^2 and P^3, the shaft R, carrying the rollers R^2 and R^3, the arms S, fulcrumed on said shaft O and carrying said shaft R, and the table S', connecting said arms S with each other, in combination with the slat belts P, P', and Q, the pushing-fingers Q', secured to the ends of the slats of the belt Q, each pushing-finger being provided with a foot traveling on said table, and the knives V^2, held on the under side of said table between the slat belts P Q and Q P', substantially as shown and described.

4. The combination, with the power-shaft, the endless feed-belt or carrier operated from said shaft, and a clutch for throwing the same into and out of gear, of the continuously-operated transversely-reciprocating spreader-bar at the delivery end of the belt, and gearing connecting it at all times with the power-shaft, said gearing being unaffected by the action of the said clutch, whereby the spreader will continue to operate after the feed-belt has been stopped, substantially as set forth.

5. The combination of the power-shaft, the horizontal endless feed-belt or carrier oper-

ated therefrom, a clutch mechanism for connecting it with and disconnecting it from the power-shaft, an inclined endless belt above the first-named belt and driven continuously from the power-shaft independently of the horizontal belt, with the two continuously-operated transversely-reciprocating spreader-bars at the delivery ends, respectively, of said belts, and having spreading-fingers curved or inclined downwardly, and a table common to both spreaders, the upper spreading-fingers operating across the table in advance of the lower fingers, whereby both spreaders and the upper belt will be operated when the lower feed-belt is disconnected from the power-shaft by means of its clutch mechanism, substantially as set forth.

6. In a band-cutter, the combination, with the endless slatted belt or carrier, the continuously-rotated shaft F at the delivery end of the said belt, a sleeve loose on said shaft, a roller on the sleeve around which the said delivery end of the belt passes, and a clutch-connection between the said continuously-rotated shaft and the sleeve thereon, of links or arms secured to the said sleeve, a grain-spreader bar mounted in said links or arms, and operating-connections between the shaft F and the said spreader-bar for continuously operating it, substantially as set forth.

7. In a band-cutter and feeder for thrashing-machines, the main shaft C, the wide gear D^3, driven continuously therefrom, the shaft F, the sleeve F^2, through which said shaft passes, and provided with a clutch adapted to be engaged with or disengaged from a clutch, D^5, held on said shaft, the gear D^4, meshing with the said wide gear and connected to the said clutch D^5 on the shaft F, the roller G′, secured on said sleeve, and the endless slat belts G, passing over said roller, the shaft H^2, supported in arms fulcrumed on said sleeve F^2, the prongs H′, held on said shaft, the mechanism I, for imparting a sliding motion to said shaft H^2 from said rotary shaft F, and means, substantially as described, for disconnecting the clutch F′ from the clutch D^5, whereby the motion of the slat belts G ceases, while the crosswise sliding motion of the shaft H^2 and its prongs H′ continues, as set forth.

8. In a band-cutter and feeder for thrashing-machines, the sleeve F^2, the arms H^5, fulcrumed on said sleeve F^2, the shaft H^2, mounted in the free ends of said arms H^5, and having a crosswise sliding motion, in combination with the mechanism K, for imparting a swinging motion to said arms H^5, whereby said shaft H^2, with its prongs H′, is raised or lowered, substantially as shown and described.

9. In a band-cutter and feeder for thrashing-machines, the combination, with the table G^3, provided on top and in its middle with a ridge, G^5, of the partition G^6, provided on its lower edge with pins engaging said ridge, said partition G^6 being hinged at the upper corner of its inner end to a cross-beam of the main frame, so that said partition G^6 can be disengaged from said ridge and swung upward and on the thrashing-machine, substantially as shown and described.

JOHN H. SPURGIN.

Witnesses:
CLAUDE L. BERRY,
C. B. STICKNEY.