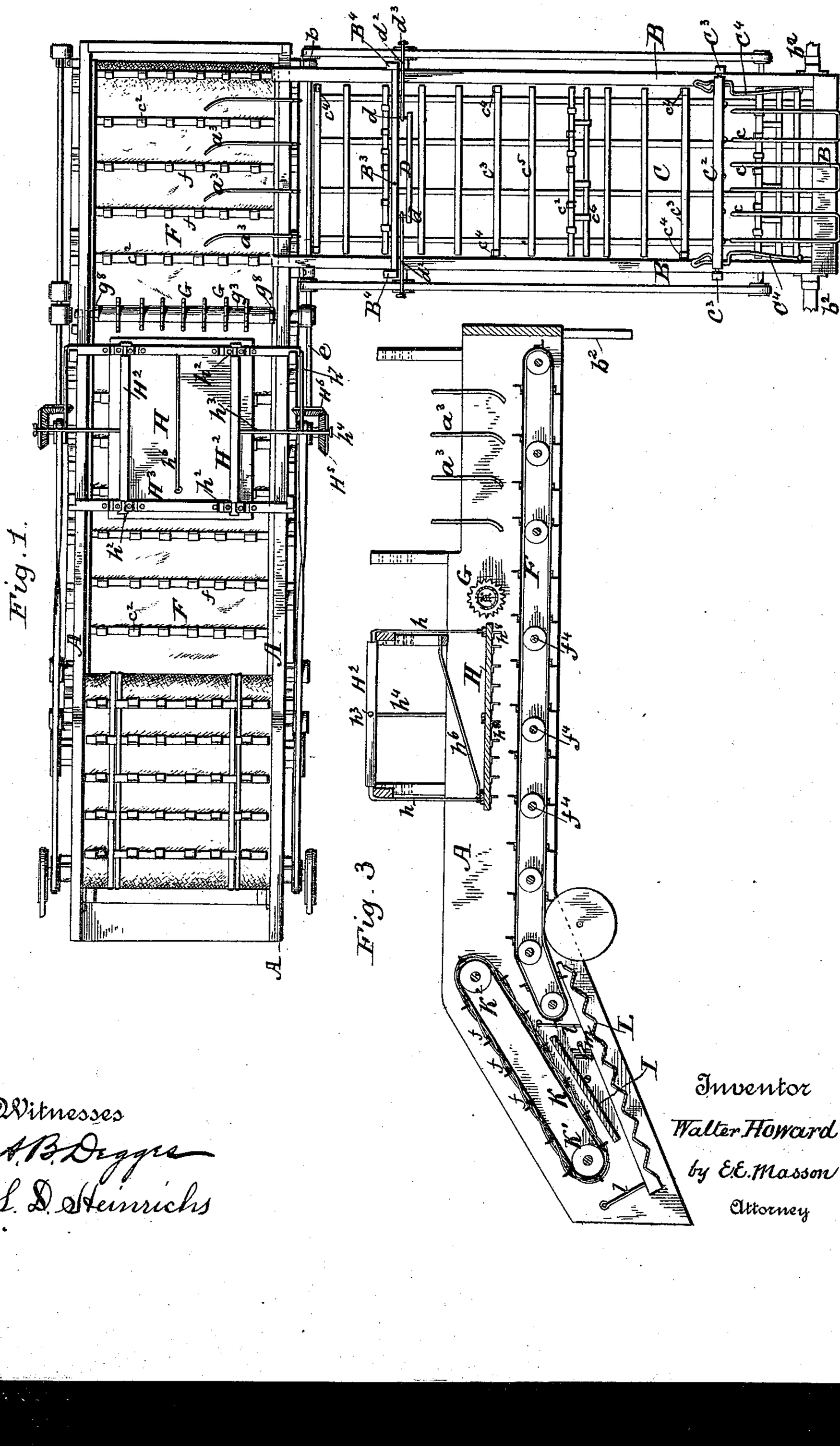
(No Model.) 3 Sheets—Sheet 1.

W. HOWARD.

COMBINED FEED REGULATOR, BAND CUTTER, AND SPREADER.

No. 501,511. Patented July 18, 1893.



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COMBINED FEED REGULATOR, BAND CUTTER, AND SPREADER.

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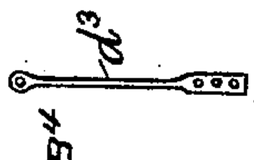

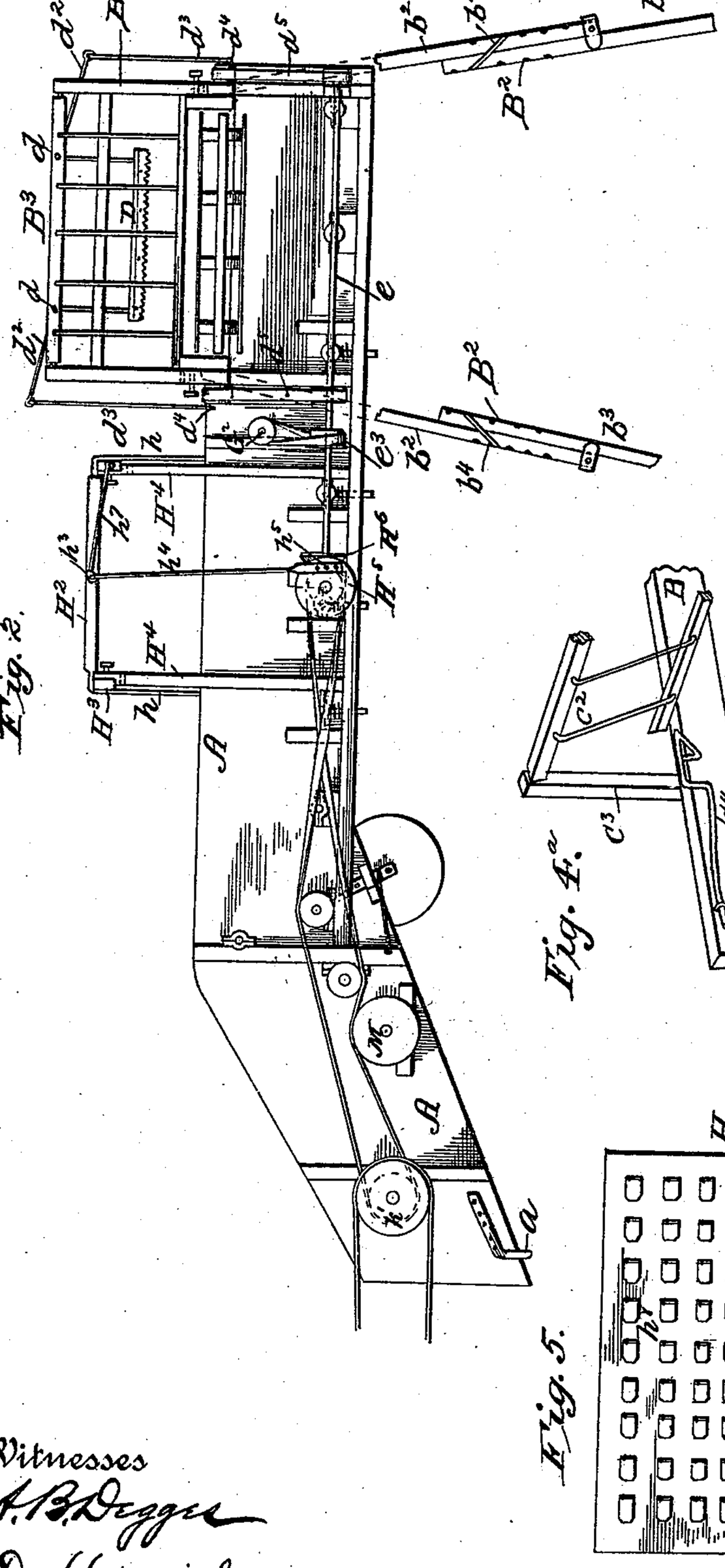

Fig. 2.

Fig. 4a.

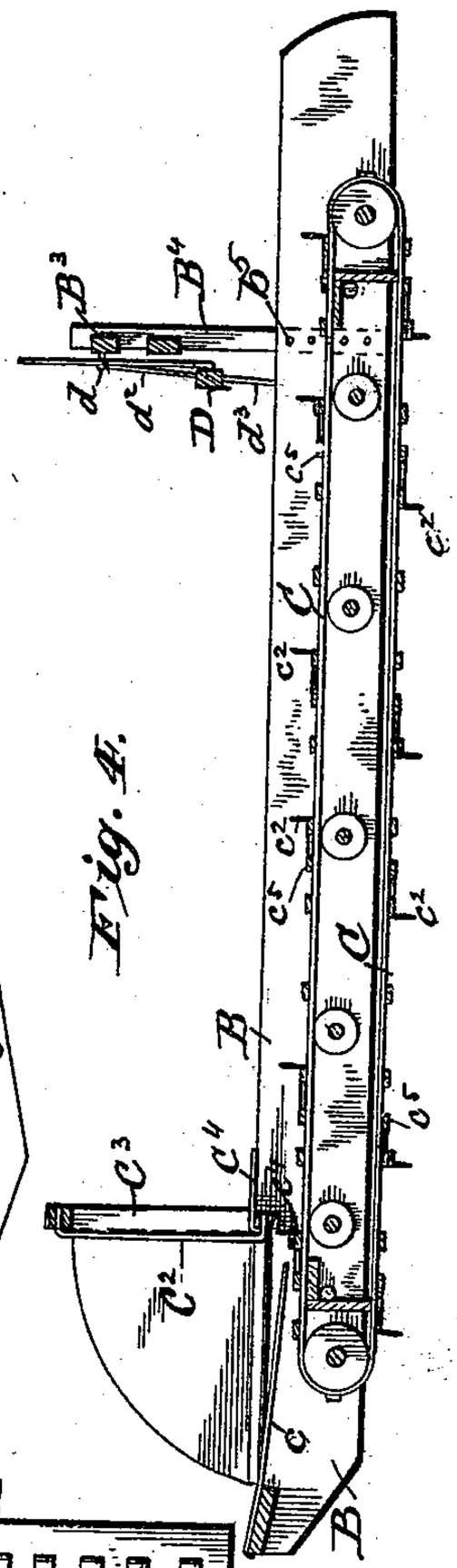

Fig. 4.

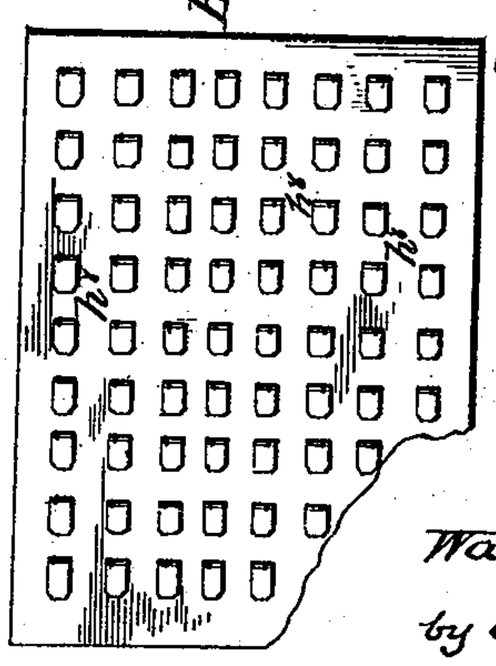

Fig. 5.

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Fig. 6.

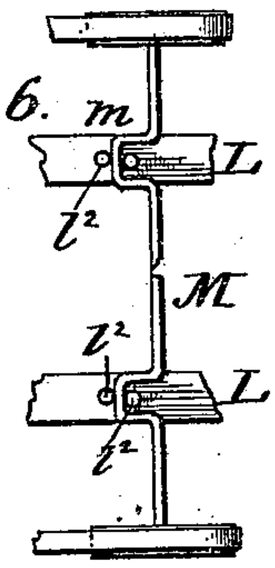


Fig. 7.

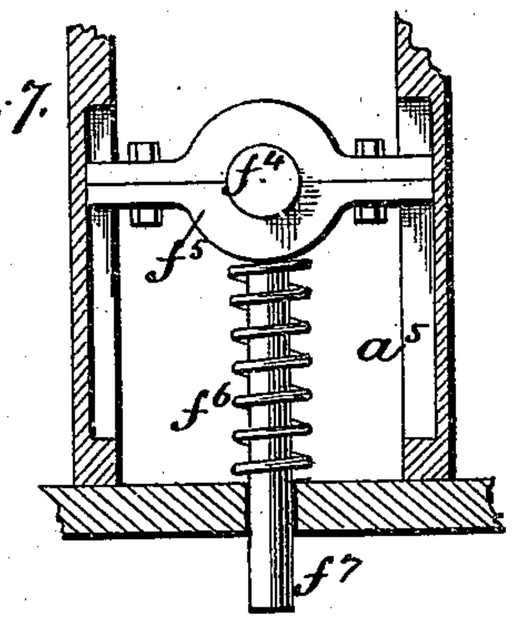


Fig. 8.

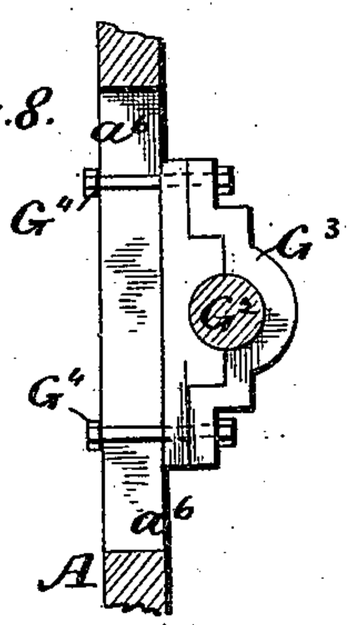


Fig. 9.

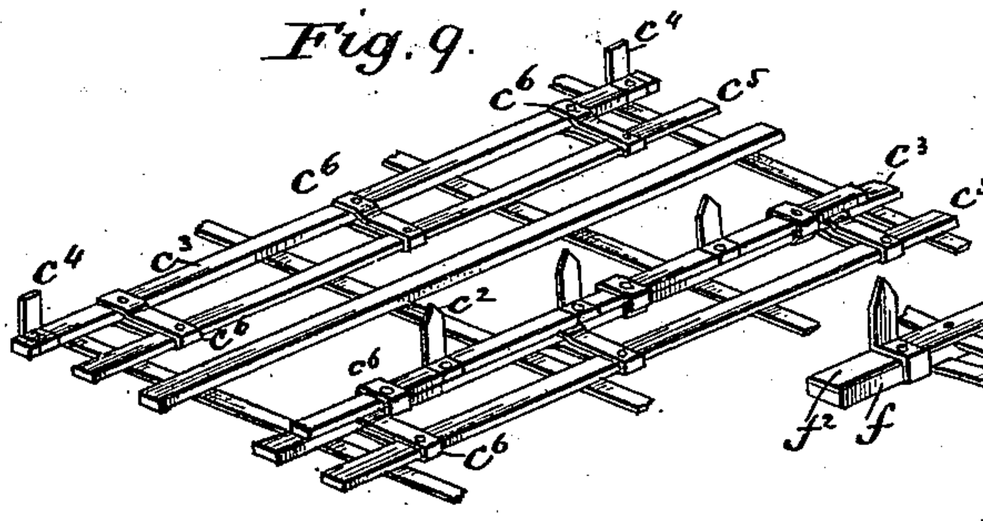


Fig. 10.

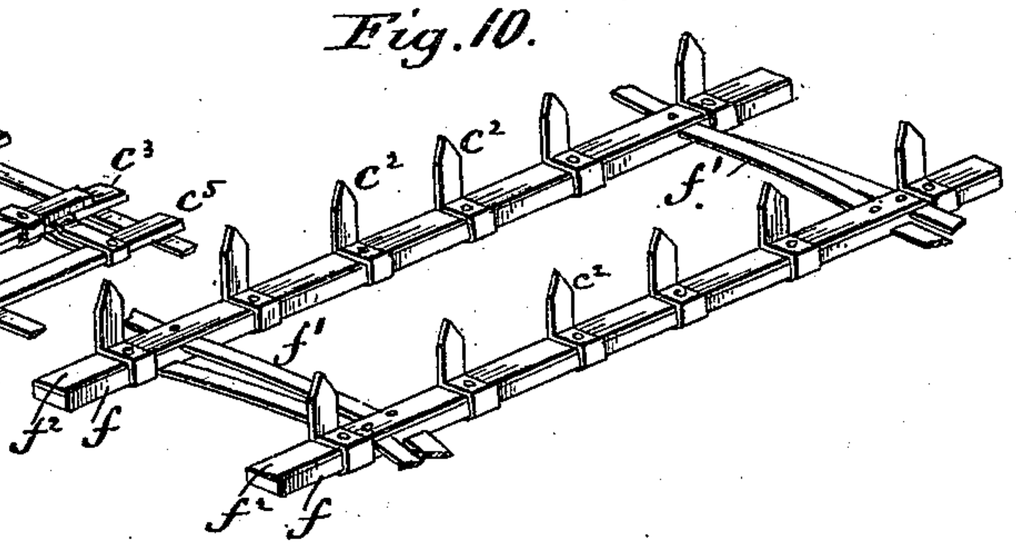


Fig. 11.

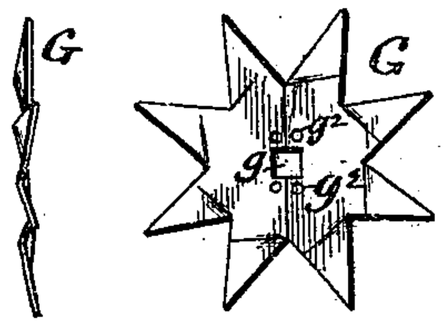


Fig. 12

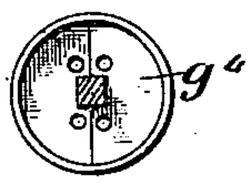


Fig. 13.

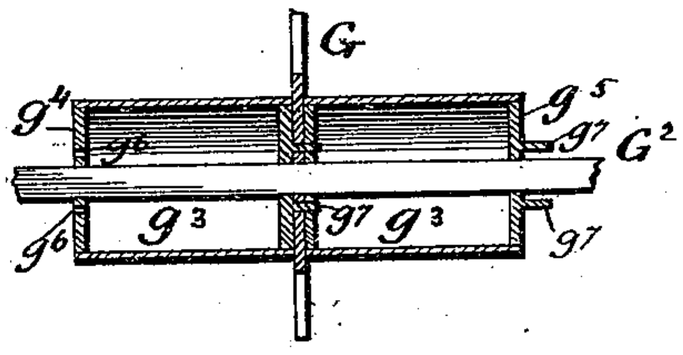


Fig. 14.

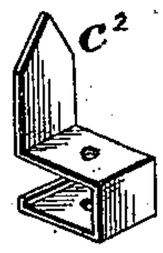
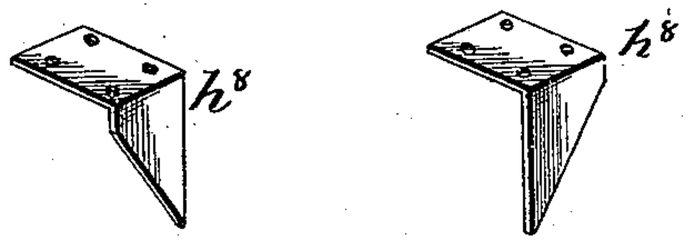


Fig. 15.



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Inventor
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UNITED STATES PATENT OFFICE.

WALTER HOWARD, OF WASHINGTON, DISTRICT OF COLUMBIA.

COMBINED FEED-REGULATOR, BAND-CUTTER, AND SPREADER.

SPECIFICATION forming part of Letters Patent No. 501,511, dated July 18, 1893.

Application filed February 28, 1893. Serial No. 463,996. (No model.)

To all whom it may concern:

Be it known that I, WALTER HOWARD, a citizen of the United States, residing at Washington, in the District of Columbia, have invented certain new and useful Improvements in a Combined Feed-Regulator, Band-Cutter, and Spreader, of which the following is a specification, reference being had therein to the accompanying drawings.

My invention relates to a combined feed regulator, band cutter, spreader and feeder for thrashing machines; and the objects of my invention are to provide certain improvements in machines of this character which greatly facilitate the handling of the grain by the feeder, while at the same time providing new means for the cutting of the bands and evenly distributing the grain to the cylinder end of a thrasher. I attain these objects by the construction illustrated in the accompanying drawings, in which—

Figure 1, is a top view of a combined band cutter and feeder constructed in accordance with my invention. Fig. 2, is a side view of the same. Fig. 3 is a longitudinal vertical section of the central portion of the machine leading directly to the cylinder end of a thrasher. Fig. 4, is a longitudinal section of the side or wing grain-carrier, band cutter and feeder of the machine. Fig. 4ª is a perspective view of a portion of the suspended gate and of the side-apron frame, carrying one of the gate latches. Fig. 5, is a bottom view of the laterally movable grain spreader carried in the central portion of the machine. Fig. 6, is a top view of a double crank shaft used to oscillate the stepped grain board located upon the machine adjacent to the cylinder-end of the thrasher. Fig. 7, is a vertical section through the grooved standards used to guide one of the spring supports carrying the shaft of one of the rolls carrying the long apron in the central portion of the machine. Fig. 8, is a vertical section of one of the sides of the central portion of the machine adjustably carrying the shaft of the rotary grain spreader. Fig. 9 represents in perspective a portion of the apron of the wing grain-carrier having detachable and adjustable teeth-carrying slats and also gate-opening vertical projections at the ends of one of the slats. Fig. 10, represents in perspective a portion of the apron adjacent to the cylinder-end of the thrasher and showing the belts interlacing the slats of said apron. Fig. 11 represents in edge view and front view one of the toothed plate-wheels used on the rotary grain spreader. Fig. 12, is an end view of one of the sleeves used between the grain-spreading toothed wheels. Fig. 13, represents a vertical section of one of the grain-spreading toothed wheels with a sleeve on each side thereof. Fig. 14, represents in perspective one of the teeth used upon one of the slats of the apron shown in Fig. 10. Fig. 15, represents one of the right hand side and also one of the left hand side teeth used pendent from the laterally movable grain spreader shown in Fig 5.

In said drawings A represents the frame of the central portion of the machine leading directly to the cylinder end of a thrasher to which it is secured by means of hooks *a*, or other well known means. The outer end of said frame is to be supported in any suitable and well known manner.

To either side of the rear portions of the frame A, there is hinged at *b*, a frame B forming a part of a side or wing grain-carrier support of the machine. The outer end of said support is carried adjustably elevated upon slightly divergent legs B^2 consisting of an upper prop b^2 having its top end secured to the wing support B, and a lower prop b^3 having its bottom resting upon the ground. The lower portion of the prop b^2 has notches in one of its sides, while the upper portion of the prop b^3 has also notches in one of its sides, and said notches are to receive the upper and lower cross bars of a rectangular link b^4 that adjustably unites the props, and permits the length of the legs B^2 to be regulated.

The bundles of grain to be thrashed are first deposited by the attendant upon rods *c* secured in a slightly inclined position in the outer end of the wing support B; said rods, in connection with the teeth c^2 of the apron C, bringing the bundles against a vertical gate C^2 that is pivotally suspended from the top of the posts C^3 upon the supports B. Said gate is kept normally closed by means of hooked spring-latches C^4 engaging with the lower portion of the sides of the gate. To automatically open said gate, the apron is provided from distance to distance with trans-

verse slats c^3 that are provided at their ends with vertically projecting fingers c^4, the outer sides of which is adapted to ride against the converging sides of the spring latches C^4, push them outwardly, and release the swinging gate; the teeth c^2 of the apron, in connection with the latter will then advance the bundles of grain, and permit the gate to swing back to its normal closed position.

The slats carrying the projecting fingers c^4 and also the slats carrying the teeth c^2 are secured to the plain smooth slats c^5 of the apron by means of sheet metal straps c^6 that permit the armed slats to be arranged closer together, or farther apart according to the nature of the grain and the capacity of the thrashing machine. The teeth c^2 clearly shown in Fig. 14 consist of sheet metal bent nearly in the form of the numeral 5, having its lower rectangular loop embracing the rectangular slat to which it is furthermore secured by means of a rivet passing vertically therethrough. When the bundles of grain have nearly reached the inner end of the apron C, they pass under the band cutter D that is suspended from one of the ends of two bell-crank levers d^2, each one pivoted at d to a beam B^3 supported upon posts B^4 projecting up from the frame of the wing support B. The upper end of each bell-crank is united by means of a connecting rod d^3 with a crank pin d^4 upon a shaft that is revolved by a belt d^5 that passes also around a pulley upon a shaft e mounted in suitable bearings along side of the frame A, of the central portion of the machine. The crank pins d^4 are so timed relatively to each other that when the pin on one side is up, the pin on the opposite side is down, and this construction gives a segmental-swinging and draw-cut motion to the cutter D, which readily cuts the bands of the bundles. The length of the connecting rods d^3 is adjustable by means of a series of holes in the lower portion thereof to receive the crank pins. The posts B^4 are vertically adjustable upon the support B, by the insertion of bolts through holes b^5 Fig. 4, through the lower portion of said posts, so that the beam B^3 and the cutter D can be more or less high above the apron C according to the size of the bundles of grain. From the apron C, the grain is conducted to the central portion having the frame A of the machine, over slightly inclined and bent wire rods a^3 secured to the outside of said frame A, and falls upon the central portion of a canvas apron F that is provided with slats f having their outer faces preferably provided with protecting sheet metal plates f^2 and armed with teeth as c^2 shown in Figs. 10 and 14 and hereinbefore described.

To evenly spread the grain on the apron F, it is conducted by the apron F, first under a rotary spreader having two series of star-pointed wheels G, the points of which are inclined substantially like the blades of a propeller, the blades of one series being bent to the right hand side, and the blades of the other series being bent toward the left hand side. Each pointed wheel G is made in two halves, and each half is provided with two eccentric perforations g^2 besides the square central perforation g that receives the shaft G^2. The pointed wheels G are kept at proper distances apart by means of sleeves g^3 that are provided with heads g^4 and g^5. The heads g^4 are provided with perforations g^6 having locations corresponding with those of the perforations g^2 of the pointed wheels G, and the heads g^5 are provided with pins g^7 to pass through the perforations g^2 and g^6. The wheels G and the sleeves between them are all securely clamped together and to the shaft by means of nuts g^8 upon said shaft pressing against the outer sleeves of the series. Said shaft carries a pulley and a belt on the latter by means of which it is rotated from the shaft e by means of a pulley e^3 on the latter. The grain after passing under the rotary spreader is conducted under a rectangular platform or spreader H retained substantially horizontally a short distance above the apron F. Said spreader is suspended by means of connecting rods h from two shafts H^2 received in bearings h^2 adjustably mounted on transverse beams H^3 that are adjustably retained by means of pins or bolts upon posts H^4 secured to the frame A. To give a nearly horizontal oscillatory motion to the spreader H, the shafts H^2, to the ends of which the connecting rods h are attached, are oscillated in their bearings by means of horizontal rods h^3 inserted diametrically into said shafts H^2.

To the outer end of each rod h^3 is attached one end of a connecting rod h^4 extending vertically therefrom to a crank pin h^5 projecting from the outer face of a bevel cog wheel H^5 that is in gear with a similar wheel H^6 upon the front end of the shaft e. As the height of the transverse beams H^3 is adjustable, the length of the connecting rod h^4 is adjustable, being provided on its lower end with a series of holes into one of which the crank pin h^5 can be retained.

To prevent the grain in its travel upon the apron F from partly dragging the spreader H, the latter is connected with the frame by a bracing rod h^6. The outer end of each rod h^3 is also properly sustained by brace-rods h^7 having one end secured to the frame.

To properly and evenly spread the grain upon the apron F, the bottom of the spreader H is provided with two series of teeth h^8 of sheet metal shown in Fig. 15. One of said series, (occupying one-half of the surface,) have their pendent points beveled on one side, and the other series on the opposite side. The grain after passing under the spreader H is carried by the apron F to the front end thereof, and passes over an inclined board I, upon which it is advanced by means of an endless canvas apron K placed above it and mounted upon rollers K′ and K^2.

Upon the apron K are placed a series of slats as f Fig. 10, provided with protecting

sheet metal plates f^2; said slats being interwoven with bands f' of leather, or other suitable material. The apron K is made to travel at a higher speed than the apron F the shaft of its roller K′ having a pulley k' connected with the shaft of the thrashing cylinder, and consequently rapidly removes the grain from the end of the apron F.

Under the end of the apron F, and also under the inclined board I is placed a stepped shaking board L that is suspended from rods l and has a longitudinal rocking motion imparted thereto by the cranks m of a crank shaft M Fig. 6, in engagement with pins l^2 projecting up from the top of the side of the shaking board.

To support the apron F yieldingly under the spreader H the rollers carrying said apron have their shafts f^4 carried in boxes f^5 Fig. 7 having their ends vertically guided in slots a^5 formed in the frame. The bearings f^5 are supported on springs f^6 coiled around pins f^7 pendent from the bearings f^5.

To permit the shaft G^2 of the rotary spreader to be adjusted relatively to the apron F, each end of said shaft is carried in a bearing G^3 Fig. 8, that is connected with the frame by means of bolts G^4 passing through a vertical slot a^6 in the sides A of the frame of the machine.

Having now fully described my invention, I claim—

1. In a band cutter and feeder, the combination of a side apron carrier B, posts thereon, a gate suspended from said posts, and spring catches having one end secured to the frame B and the other end in engagement with the sides of said gate with an apron having transverse slats and latch-opening fingers projecting upon said slats substantially as described.

2. In a band cutter and feeder, the combination of a slat carrier, rectangular slats c^5 secured thereto transversely thereof, metal straps c^6 removably secured to any one of the slats c^5, and slats c^3 carrying gate-latch opening fingers c^4 and carried by said straps c^6, whereby the distance between the slats c^3 is adjustably regulated; and teeth c^2 mounted upon the slats substantially as described.

3. In a band cutter and feeder, the combination of a side apron carrier B, posts adjustably secured thereon, a beam B^3 mounted upon said posts, bell-cranks pivoted to said beam, a cutter attached to one end of said bell-cranks, a shaft located transversely of the apron carrier, crank pin carriers upon said shaft, and connecting rods adjustably uniting the crank pins of said carriers with the bell-cranks substantially as described.

4. In combination with the apron of a band cutter and feeder the rotary spreader consisting of pointed wheels G, drums g^3 between them, each drum having a head provided with perforations g^6 and a head provided with pins g^7 to enter the perforations g^6, and also the perforations g^2 in the wheels, with a shaft passing through the wheels and the drums, and nuts g^8 upon said shaft substantially as described.

5. In combination with the apron of a band cutter and feeder, the oscillatory spreader H consisting of a platform having secured to its under side, two series of sheet metal angular teeth h^8 having one edge beveled, posts H^4 mounted upon the inclosing frame of the apron, beams H^3 adjustably retained upon said posts, shafts H^2 adjustably retained upon said beams and means to oscillate said shafts substantially as described.

6. In combination with the grain spreader of a band cutter and feeder, the apron thereof having slats provided with sheet metal covering plates and with teeth, and said slats interwoven with flexible straps passed under said plates substantially as described.

In testimony whereof I affix my signature in presence of two witnesses.

WALTER HOWARD.

Witnesses:
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A. B. DEGGES.