(No Model.)

# R. JOHNSON.

## BAND CUTTER AND FEEDER FOR THRESHING MACHINES.

No. 574,485. Patented Jan. 5, 1897.

Fig. 1.

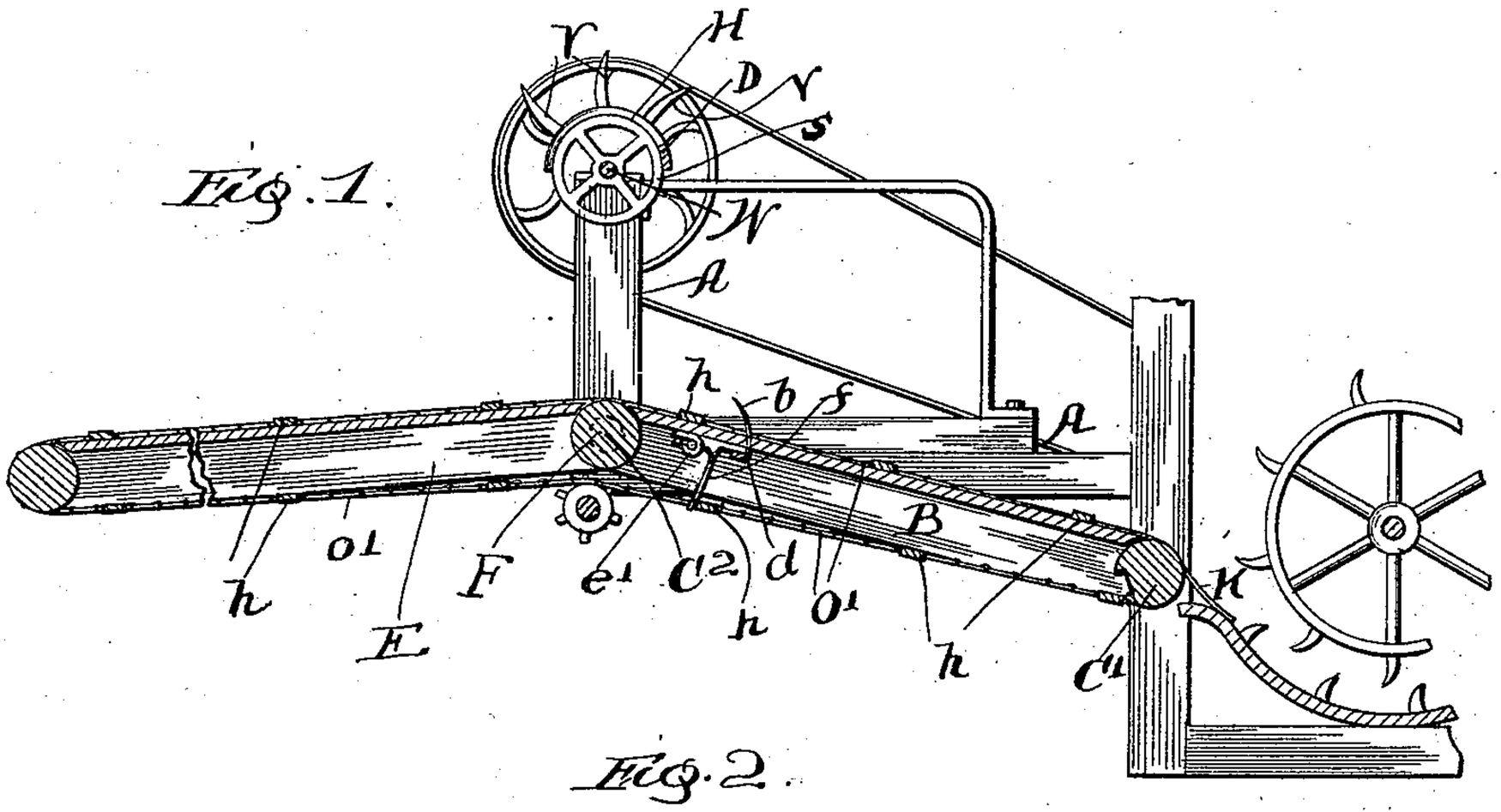



Fig. 2.

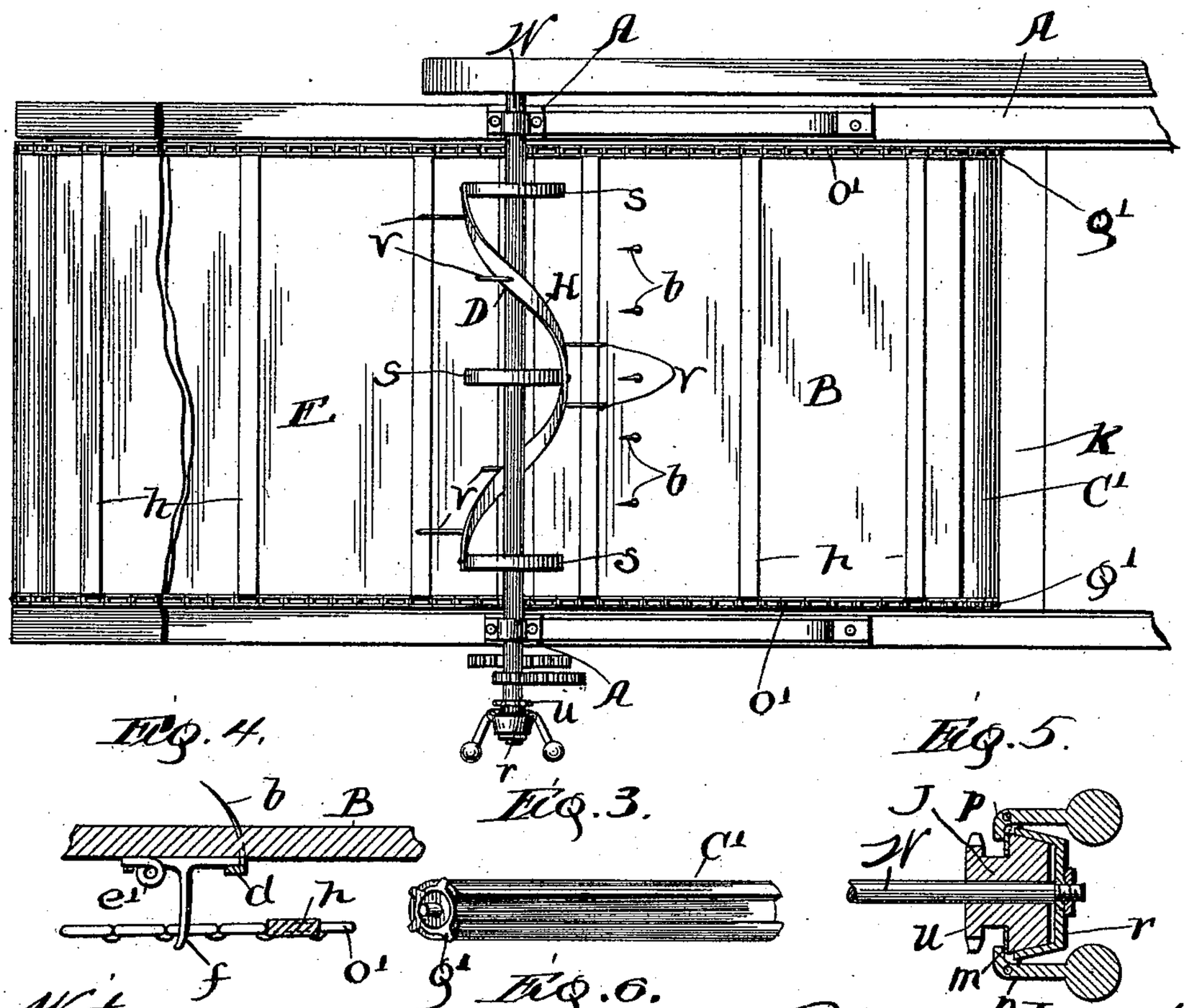



Fig. 4.



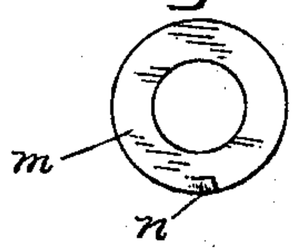

Fig. 3.




Fig. 5.




Fig. 6.

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# UNITED STATES PATENT OFFICE.

RICHARD JOHNSON, OF FREEPORT, ILLINOIS.

## BAND-CUTTER AND FEEDER FOR THRESHING-MACHINES.

SPECIFICATION forming part of Letters Patent No. 574,485, dated January 5, 1897.

Application filed January 14, 1895. Serial No. 534,885. (No model.)

*To all whom it may concern:*

Be it known that I, RICHARD JOHNSON, a citizen of the United States, and a resident of Freeport, in the county of Stephenson and State of Illinois, have invented certain new and useful Improvements in a Band-Cutter and Feeder for Threshing-Machines, of which the following is a full, clear, and exact description, reference being had to the drawings accompanying the same.

The object of my invention is to provide a new and improved method of cutting bands, spreading, regulating, and feeding bundles of straw, rye, flax, grain, or other cereal to a threshing-machine, whereby feeding may be accomplished in a simple, easy, uniform, and regular manner.

By the use of my device I dispense entirely with the cumbersome reciprocating tables and cylinder band-cutters heretofore in use on most machines of the character herein described. Besides, my machine can be more easily adjusted, made stronger and more durable than any machine of the kind now in use.

My invention consists of an improved automatic retarding, spreading, feeding, and band-cutting device for threshing-machines, as shown in the drawings, in which—

Figure 1 is a sectional side elevation of the machine, showing the relative position of the mechanism when in operation. Fig. 2 represents a plan view of my automatic band-cutter, retarder, and feeder. Fig. 3 shows the grooved roller, with the sprocket-wheel for operating the same. Fig. 4 is a sectional side view of the spring retarder and spreader. Fig. 5 is a sectional view of my improved governor for my machine. Fig. 6 shows the friction-brake or check-ring of my improved governor.

My machine is mounted on a substantial frame A, and motion is imparted to the mechanism from the main driving-shaft W.

My improved automatic feeder and spreader consists of a wooden framework B, at each end of which is mounted in suitable bearings slotted or grooved rollers $C'$ $C^2$, a set of spring retarding-prongs $b$ $b$ rising at regulated intervals through perforations in the feed-bed of the feeding-carrier B and adapted to engage the bundles of flax or grain as they pass under the band-cutter D. The construction of this retarding, feeding, and spreading device is very simple.

At each end of the frame B there is mounted a roller, each of which has one or more grooves or slots, and on the end of each roller are sprocket-wheels $g'$, around which travel sprocket-chains $o'$. On the sprocket-chains at regular intervals are fastened traveling carriers $h$ $h$, arranged to be moved forward by the sprocket-chains $o'$ $o^2$, and as the chains convey the carriers $h$ $h$ around the roller $C'$ the carriers drop successively into the grooves of the roller C and remain there while the roller makes a semirevolution. I am thus enabled to bring the discharge end of my feeding device up close to the cylinder of the separator without encroaching on the throat-space of the concave and prevent the escape of any grain during the operation of feeding.

The spring retarding sheaf-prongs $b$ $b$ are rigidly fastened to the iron bar $d$, and this bar is pivoted to the springs $e'$ $e^2$, which are secured to the under side of the frame B. As the traveling carriers $h$ $h$ return under the said frame they engage the spring-levers $f$ $f$ and draw the prongs downward to permit the traveling carriers on the surface of the feed-carrier to pass. The springs $e$ $e$ then force the prongs upward again through the feed-bed, and as the prongs rise they engage the bundles of grain, separate and hold them till the bands are effectually cut and the bundles thoroughly spread and prepared to be carried into the cylinder.

It will be seen that the carriers $h$ $h$ perform two functions on my machine, namely, that of carrying the grain to the cylinder on the upper surface of the feed-bed and operating the spring sheaf-prongs $b$ $b$ on the under side of the feed-bed. By the use of this device I provide an effectual method of separating and holding the bundles of grain or flax against the band-cutter and regulating the movement of the grain through the feeder, besides spreading the grain thoroughly before it enters the cylinder.

Another feature of my invention consists in uniting the bundle-carrier E and my feed-carrier B, so that they form one continuous feeding-surface. This is accomplished by mounting the bundle-carrier E and the feed-carrier B on one shaft F and adjusting the

sprocket-chains *o o*, so that they revolve around both carriers combined and form one complete feeding mechanism which carries the grain up to and discharges it directly into the cylinder.

The letter D represents the spiral band-cutter of my machine. It consists of three disks *s s s*, mounted on the main driving-shaft of the machine and having bolted on the periphery thereof a spiral metal band H, to which the curved knives V V are rigidly fastened, one following the other around the spiral band H.

In the construction and mode of operation of my band-cutter, as shown, I am enabled to secure two important results in the method of feeding grain hitherto unattainable. In the first place, as the bands of the bundles are being cut with my device a lateral motion is imparted to the sheaves, by which they are spread, opened, and loosened up before being discharged into the cylinder, and I am also enabled to dispense with the reciprocating cutters used on some machines of this character and the drum-cutters used on others and to provide mechanism whereby the band of each and every sheaf entering the feeder will be completely cut and spread apart. Besides, in my band-cutter the knives, which are secured by bolts, are easily detached, so that they can be conveniently sharpened, repaired, or replaced.

Between the end of the feed-carrier B and the lip of the concave I have constructed a spring wiper K, which serves to prevent any grain escaping as it is being swept into the cylinder, and as the traveling carriers *h h* come around the roller C′ the wiper K will when required yield downward, and at once spring back to its position.

Motion is imparted to the feeding and band-cutting apparatus from the main driving-shaft through a friction-clutch brought into engagement by a centrifugally-operating governor, the clutch or governor being shown in top plan in Fig. 2 and in longitudinal section in Fig. 5. In this device a suitable conical socket is rigidly mounted upon the driving-shaft and rotates with it, and a conical sleeve *r*, provided at its inner end with a preferably integral sprocket-wheel *u*, is loosely mounted on the shaft, the conical surface of this sleeve being adapted to enter and conform to the conical inner face of the rotating socket.

Upon the periphery of the rotating socket are mounted two radially-oscillating governor-levers, provided at their outer ends with balls adapted to swing outward under the centrifugal force of the rotation of the socket and levers, and the inner ends *p* of the levers are turned inward and extend over the inner end face of the sleeve *r*. The inwardly-turned ends *p* might impinge directly upon the inner end face of the conical sleeve, but the surface of these ends or clamps is so small that in their rotation they would thus become worn and also would tend to wear rapidly and unequally the inner end of the sleeve. To avoid this difficulty, I have interposed between the clamping ends *p p* of the levers and the inner end of the sleeve *r* a flat ring or washer *m*, lying in contact with the inner end of the sleeve and adapted to be pressed firmly against it by the pressure of the clamping ends *p p*, which overlie the ring and are adapted to be pressed against it by the outward movement of the weighted ends of the levers. In order to prevent sliding or rubbing of the ends *p p* against the surface of the ring or washer *m*, I have provided the ring with one or more lugs or studs *n*, adapted to engage the inner ends of the levers before the clamping parts *p p* are pressed with any force against the body of the ring *m*, the ring being thus rotated partly with the levers as soon as they attain any considerable speed. As soon as the levers attain sufficient speed to press the clamping ends *p p* firmly against the face of the ring *m* the movement of the ring is communicated to the sleeve *r*, which is thereby pressed into the rotating socket upon the shaft until sufficient friction is developed to cause the rotation of the sleeve and the sprocket-wheel upon it in unison with the driving-shaft, movement being communicated from this sprocket-wheel to the band-cutting mechanism.

It will be seen that by means of the clutch the movement of the driving-shaft is communicated to the band and feed cutting mechanism, that the governor-arms effect the contact and engagement of the working conical surfaces of the clutch, and that by means of the interposed ring *m* and its lug or lugs *n* the only surfaces which rotate one upon the other are completely annular, so that there is no possibility of uneven wear of the working parts. By means of this entire clutch and governor device the operation of the feed and band-cutting mechanism can only begin when the threshing mechanism, from which the power is derived, is in sufficiently rapid motion to give the parts working results. The sheaves are then thrown on the bundle-carrier E and conveyed up to the band-cutter D, and while the bands are being cut the sheaves are pinioned and separated by the retarding-prongs *b b* and held till the band is severed. When the bands are cut, the sheaf is scattered on the feed-surface by the lateral motion imparted by the band-cutter. The bands being thus cut and the bundles being effectually scattered the traveling carriers *h h* carry the grain regularly forward and discharge it into the cylinder.

Having thus described my invention, what I claim, and desire to secure by Letters Patent, is—

1. In an automatic feeder for threshing-machines the combination with an endless carrier provided with transverse slats and a table lying beneath the upper fold of the carrier, of retarding-prongs pivoted below the table and adapted to be projected upward

through it, or drawn completely beneath it and levers connected with said prongs and adapted to be actuated by the slats of the lower fold of the carrier, whereby the slats on the lower fold moving in one direction may operate to draw said prongs below the table at suitable intervals to permit the passage of the slats of the upper fold of the carrier in the opposite direction.

2. In an automatic feeder and band-cutter for threshing-machines; the spring retarding-prongs *b*, *b*, fastened to the cross-bar *d*, and the levers *f*, *f*, and adapted to be withdrawn through the feed-table by the returning slats to permit the slats traveling toward the cylinder on the surface of the feed to pass substantially as described.

3. In a band-cutter and feeder for threshing-machines, the combination with a shaft, W, of the hub, J, and sleeve, *r*, mounted thereon, the ring, *m*, having the check-stud, *n*, and lying in contact with the inner face of the hub, and the centrifugally-operated governor-arms and clamps, *p*, the clamps being adapted to be pressed against the ring by the outward movement of the governor-arms, and the check-stud being adapted for engagement with the clamps *p*, to prevent slipping of the clamp upon the ring, *m*.

4. In an automatic feeder for threshing-machines, the spiral band-cutter D, in combination with the spring retarding device, the traveling slats *h*, *h*, the bundle-carrier E the feed-carrier B with means for operating the same substantially as described.

5. In a feeder for threshing-machines the spring retarding-prongs *b*, *b*, in combination with the traveling slats *h*, *h*, and the grooved roller C, substantially as described.

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