2 Sheets—Sheet 1.

W. CARR.
Thrashing-Machine.

No. 197,719. Patented Dec. 4, 1877.

FIG. 1.

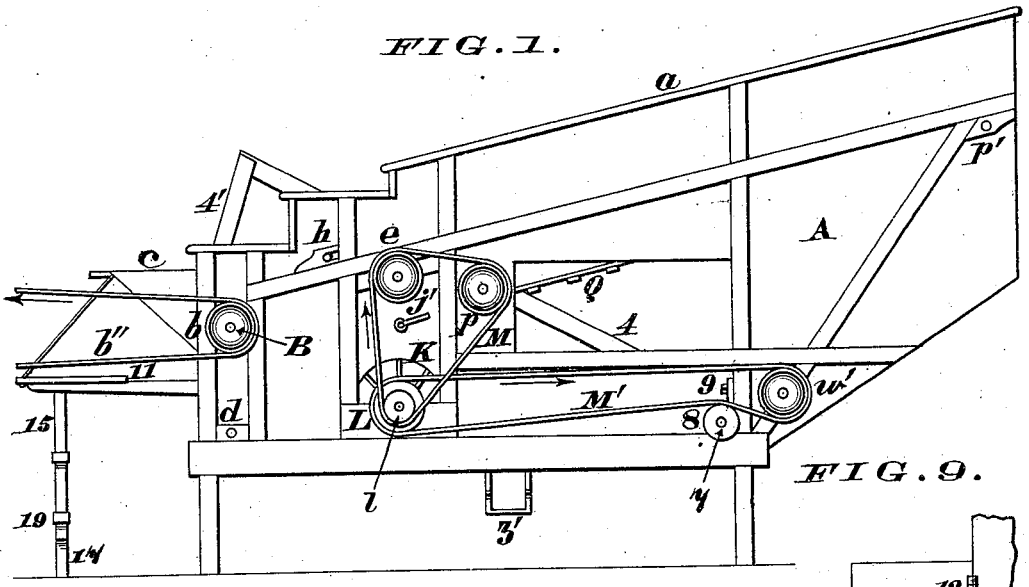


FIG. 9.

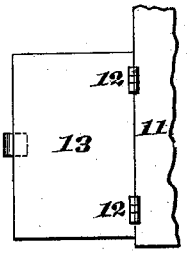


FIG. 2.

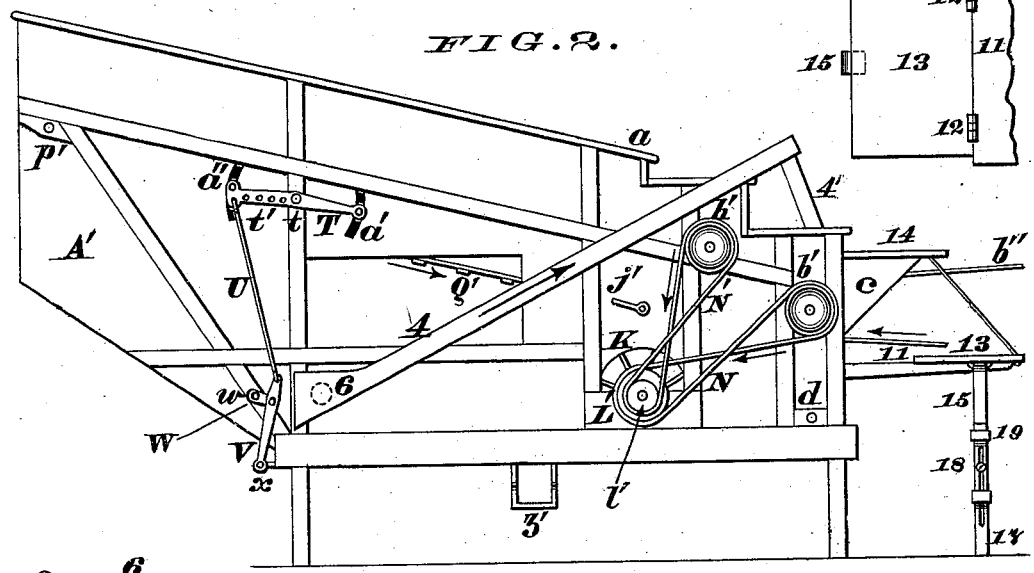


FIG. 8.

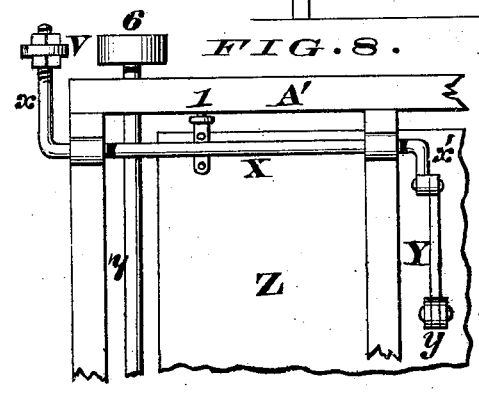
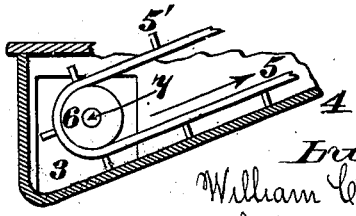


FIG. 10.



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2 Sheets—Sheet 2.

W. CARR.

Thrashing-Machine.

No. 197,719. Patented Dec. 4, 1877.

FIG. 4.

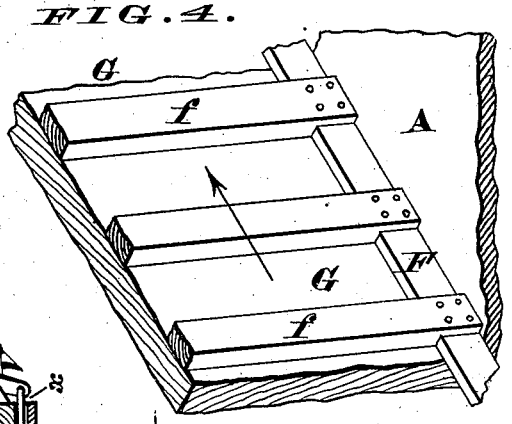

FIG. 5.

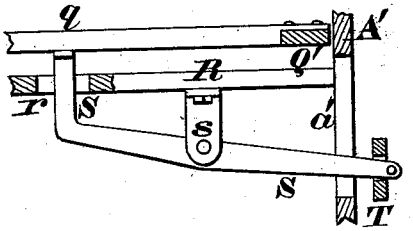

FIG. 6.

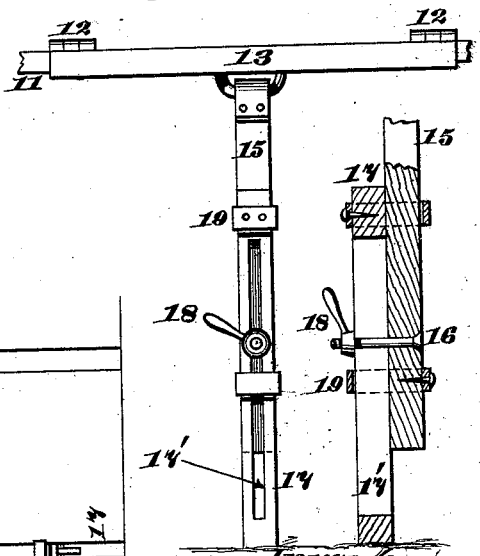

FIG. 3.

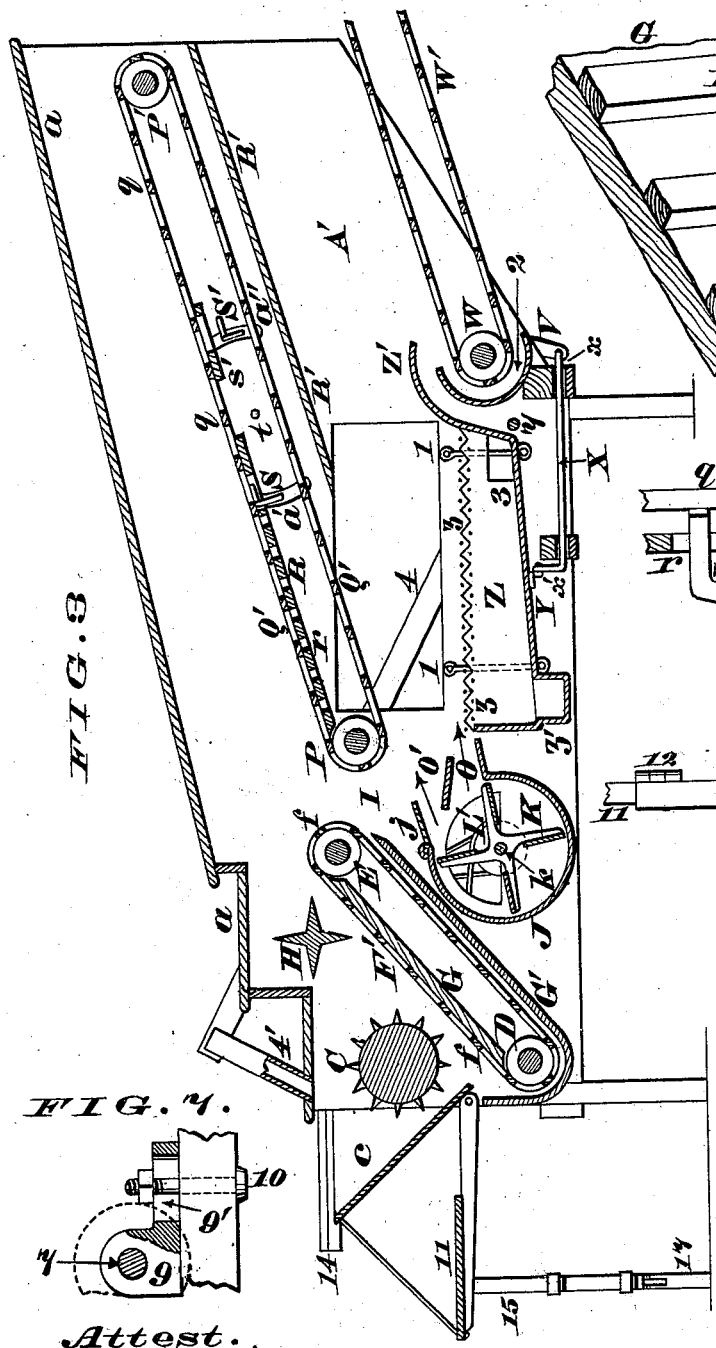

FIG. 7.

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UNITED STATES PATENT OFFICE.

WILLIAM CARR, OF YELLOW SPRINGS, OHIO.

IMPROVEMENT IN THRASHING-MACHINES.

Specification forming part of Letters Patent No. **197,719**, dated December 4, 1877; application filed March 12, 1877.

To all whom it may concern:

Be it known that I, WILLIAM CARR, of Yellow Springs, Greene county, Ohio, have invented certain new and useful Improvements in Thrashing-Machines, of which the following is a specification:

The first part of my invention comprises a novel combination of crank, drag-link, rock-shaft, and connecting-rod, for imparting a lateral vibration to the shoe of a thrashing-machine, as hereinafter described and claimed.

The second part of my invention comprises a novel combination of knockers, walking-beam, and connecting-rod, whereby said knockers are operated by the drag-link that vibrates the shoe of the thrasher, as hereinafter described and claimed.

The third part of my invention consists in journaling one end of the elevator-shaft in a vertically-adjustable bearing or box, in order that the pulley on this adjustable end of said shaft may serve to regulate the tension of the belt that drives the straw-stacker of the machine, as hereinafter described and claimed.

The fourth part of my invention consists in hinging the band-cutter's platform to the feeding-platform, and supporting the free edge of the former upon a leg or prop capable of being extended at will, and secured with a bolt, so as to maintain said band-cutter's platform in a horizontal position, as hereinafter described and claimed.

In the accompanying drawings, Figure 1 is an elevation of one side of the machine, and Fig. 2 is an elevation of the opposite side of the same. Fig. 3 is an enlarged vertical section through the length of the machine. Fig. 4 is a perspective view of a portion of the grain-belt. Fig. 5 is a detail vertical transverse section, showing one of the agitators of the straw-belt. Fig. 6 shows, by elevation and vertical section, the adjustable leg of the band-cutter's table or stand. Fig. 7 represents the adjustable bearing of the elevator-shaft. Fig. 8 is a plan of the devices that agitate the shoe or riddle. Fig. 9 is a plan of the band-cutter's table. Fig. 10 is a vertical section through the lower portion of the elevator and its accessories.

A A′ represent the two sides, and *a* the inclosing top, of the machine. Disposed transversely of this main frame or housing, and near the front end of the same, is a shaft, B, carrying at one extremity a pulley, *b*, and at its other extremity a pulley, *b′*, the pulley *b* having a band, *b″*, passed around it, which band communicates with a horse-power or portable engine, or other convenient motor. Mounted upon shaft B is the thrashing-cylinder C, armed with teeth of any suitable construction. *c* represents the chute or hopper which conducts straw into the machine.

Located below driving-shaft B is the shaft *d* of drum or roller D, around which and another roller, E, is passed the grain-belt, whose construction is as follows: F F′ represent two parallel endless bands or belts, to which are secured any suitable number of slats, *f*, whose lower surfaces rest snugly upon the inclined floor G, that supports said belts. By this arrangement said slats sweep the floor in the most thorough manner, and cause the very smallest grain—such as flax—to be elevated to the upper end of grain-belt F F′ *f*. In the drawings all of these slats are shown as in contact with the floor; but it is evident that essentially the same result will be attained by having only a limited number of them resting upon the incline G.

G′ is a conductor placed beneath the descending portion of the grain-belt, for the purpose of conveying to the front end of the machine any straw or grain that may have been dragged back under the floor G.

Roller E carries at one end a pulley, *e*, around which is passed a belt, M, that communicates with pulley *l* of fan-shaft *k*.

Located near the upper end of grain-belt F F′ *f* is a beater, H, whose shaft *h* carries a pulley, *h′*, around which latter band N′ is passed. This band is driven by pulley *l′* of the fan-shaft *k*.

Situated immediately in rear of the grain-belt is a well, I, into which the grain is precipitated from said belt F F′ *f*. This well, which may be of any suitable width and depth, is closed at bottom by the case J of fan K, whose shaft *k* is provided at one end with a large pulley, L, and a smaller one, *l*, the other end of said shaft being furnished with a similar arrangement of pulleys, L′ *l′*. Passing around the pulley *l* is a band, M, which drives

the grain and straw belts, while the other pulley, L, on the same end of the fan-shaft, operates a band, M′, which imparts motion to the elevator-shaft 7, and also to pulley *w′* of shaft W of straw-stacker W′. Pulley L′ carries a crossed band, N, wherewith motion is imparted to fan-shaft *k* from pulley *b′* of cylinder B.

N′ is another crossed band, that drives the pulley *h′* of beater-shaft *h*, said band being operated by the pulley *l′*. Fan-case J has two discharge-ventages, O and O′, of which the upper one, O′, is capable of being closed to a greater or less degree by means of a hinged valve or flap, *j*, having external handles *j′*. It is preferred, however, to open said flap at such an angle as to cause the blast from the upper ventage O′ to be discharged directly under the straw-belt, and in a plane about parallel with said belt, as indicated by the proper arrow in Fig. 3. The lower ventage O discharges directly toward the rear of the machine, and in a plane about parallel with the riddle-screen *z*, although this exit may be so arranged as to cause the blast to be about equally divided above and below said screen.

Located at the rear of well I is the driving-drum P of the straw-belt Q Q′ *q*, said drum being situated somewhat below the level of the roller E of the grain-belt. The shaft of drum P carries a pulley, *p*, that is driven by band M, as represented in Fig. 1.

P′ represents the upper roller of the straw-carrier, said roller being journaled in the main frame of the machine at *p′*.

Extending about half the distance between these two rollers is a floor, R, perforated or slotted at *r*, and swept by the slats *q* of belt Q Q′ in precisely the same manner as floor G is cleaned by slats *f*. R′ represents a chute placed beneath the straw carrier or belt, for the purpose of discharging onto the riddle Z *z* any grain that may fall through the more elevated portion of said carrier.

In order that the grain may be completely separated from the straw, two knockers or agitators, S S′, are provided, which jar or shake the carrier Q Q′ *g* at regular and somewhat rapid intervals, every upward beat or stroke of said knockers serving to elevate said carrier a slight distance above the floor R, as seen in Fig. 5. Of these agitators, the one S is pivoted in a hanger, *s*, depending from floor R, while the other agitator, S′, is hung in a similar device attached to a cross-bar, *s′*. The outer ends of said knockers pass through curved slots *a′ a″* of the main frame, which slots are concentric with pivot *t* of walking-beam T, to whose extremities said knockers are coupled, as shown in Fig. 2.

This walking-beam is pierced with a series of apertures, *t′*, into either one of which openings may be engaged the upper end of a connecting-rod, U, whose lower end is coupled to a drag-link, V, which latter is pivoted to a crank, *w*, keyed fast to the shaft of roller W. This roller runs the straw-stacker W′, of any approved construction.

From the above description it will be seen that the rotation of crank or wrist plate *w* imparts a vibratory motion to the beam T and its attached knockers S S′. The lower end of drag-link V is coupled to the crank *x* of a rock-shaft, X, disposed longitudinally of the machine, and carrying at its inner end another crank, *x′*, to which is attached a rod, Y. The other end of this rod is coupled to the shoe Z at *y*, as more clearly shown in Fig. 8.

By referring to Fig. 3 it will be seen that this riddle or shoe is provided at top with a horizontal screen, *z*, while the bottom of said riddle slopes toward the front end of the machine, and is furnished with a discharge-spout, *z′*, that may be directed either to the right or left side of frame A A′. This riddle is supported by customary suspension-rods 1, so as to permit lateral vibration of said shoe.

Z′ is a curved deflecting-plate placed at the rear end of said riddle, for the purpose of discharging into trough 2 any tailings that may be carried along with the blast.

Trough 2 is located under roller W of the straw-stacker W′. Shoe Z is pierced with an opening, 3, through which all heavy uncleansed grain is discharged into the elevator-leg 4, and thence by a spout, 4′, into the hopper *c* of the machine, so as to be a second time subjected to the action of the cylinder and blast. The elevating appliances housed within leg 4 consist of a customary endless band, 5, armed with blades or buckets 5′, as seen in Fig. 10. This elevator-band is driven by pulley 6 on shaft 7, the other end of said shaft being provided with a pulley, 8, against whose upper surface or periphery the band M′ bears, as seen in Fig. 1. That end of shaft 7 which carries the pulley 8 is journaled in a box or bearing, 9, slotted at 9′, and furnished with a bolt or set-screw, 10, wherewith said bearing may be adjusted vertically, thereby causing pulley 8 to serve as a tightener for belt M′. The details of this vertically-adjustable bearing are seen in Fig. 7.

The feeder's platform is shown at 11, and said platform has hinged to it at 12 a stand, 13, for the person who cuts the sheaf-bands, said sheaves being then deposited upon table 14, so as to be convenient for the feeder. The free edge of this leaf 13 has hinged to its under side a leg or prop, 15, to which is secured a bolt, 16, that traverses the longitudinal slot 17′ of an extension-leg, 17. 18 is a nut, wherewith these two legs are securely coupled together, as seen in Fig. 6. 19 represent bands that unite the two legs.

The above-described arrangement of devices enables the legs to be adjusted so as to maintain the leaf 13 perfectly level, no matter how uneven the ground may be where the machine is located.

The operation of the machine is as follows: By referring to Fig. 3 it will be noticed that

the material to be thrashed is fed in at the chute *c*, and is subjected successively to the action of cylinder C and beater H, the grain thus loosened dropping upon the floor G, and being then carried up to the discharging end of belt F F′ *f* by the sweeping motion of slats *f*. The grain is now ejected from the upper end of this belt, and falls directly into the well I, where it is subjected to the separating influences of the blasts issuing from ventages O O′ of fan-case J. These two currents of air separate the chaff from the grain in the most thorough manner, the chaff being blown out at the rear end of the machine, while the grain is deposited upon screen *z* of shoe Z. In the meantime the straw elevated by belt F F′ *f* is, by the high velocity of said belt, projected across the mouth of said well I, and thrown upon the lower or receiving end of the carrier Q Q′ *q*. This carrier conducts the straw to the rear end of the machine, said carrier being agitated by the knockers S S′, so as to rattle or sift the remaining grain through between the slats *q*. Such grain as may be loosened at the lower portion of this carrier is swept through the openings *r* of floor R, and falls directly upon the riddle *z*. Any grain that may be loosened at the upper portion of said carrier falls upon the inclined partition R′, and is conducted down to the riddle, and all grain discharged from said chute R′ or sifted through the floor R *r* is subjected to the action of the double blast in the same manner as is the grain ejected from the first carrier F F′ *f*.

The operation of riddle Z and elevator 4 5, being essentially the same as in all approved thrashing-machines, requires no special description.

It may be observed, however, that the low position of my riddle and the peculiar manner in which it is operated allows it to be driven at a very high speed without imparting any oscillation to the machine, which latter remains perfectly steady without the assistance of props or side braces.

Another great advantage peculiar to my machine is, that all of the operative parts are driven with bands, of which but four are employed, and the entire absence of gearing in the thrasher renders it less liable to get out of order, while at the same time any accident that may occur to the apparatus can be repaired by the farmer.

I am aware that it is not new to arrange the grain-belts of thrashing-machines in such a manner that the under surfaces of the lower row of slats will sweep the ascending floor of the machine, and, therefore, my claim to the grain-belt is limited to the specific construction herein shown and described, whereby the under surfaces of the upper row of slats are brought in contact with said floor.

I claim as my invention—

1. In combination with crank *w*, the drag-link V, rock-shaft X *x x′*, and connecting-rod Y *y*, for imparting a lateral vibration to the suspended shoe Z *z* 1, substantially as herein described, and for the purpose set forth.

2. The combination of knockers S S′, walking-beam T *t*, connecting-rod U, and drag-link V, substantially as herein described, and for the purpose set forth.

3. The combination, in a thrashing-machine, of an elevator-shaft, 7, having one end journaled in a vertically-adjustable bearing, 9 9′ 10, in order that pulley 8 of said shaft may serve as a tightener for belt M′, substantially as herein described and set forth.

4. The combination, in a thrashing-machine, of the band-cutter's support 13, hinged to the feeder's platform at 11, and having coupled to its free edge one or more extension-legs, that rest upon the ground, substantially as herein described, and for the purpose set forth.

In testimony of which invention I hereunto set my hand.

WILLIAM CARR.

Witnesses:
JAMES H. LAYMAN,
D. P. KENNEDY.