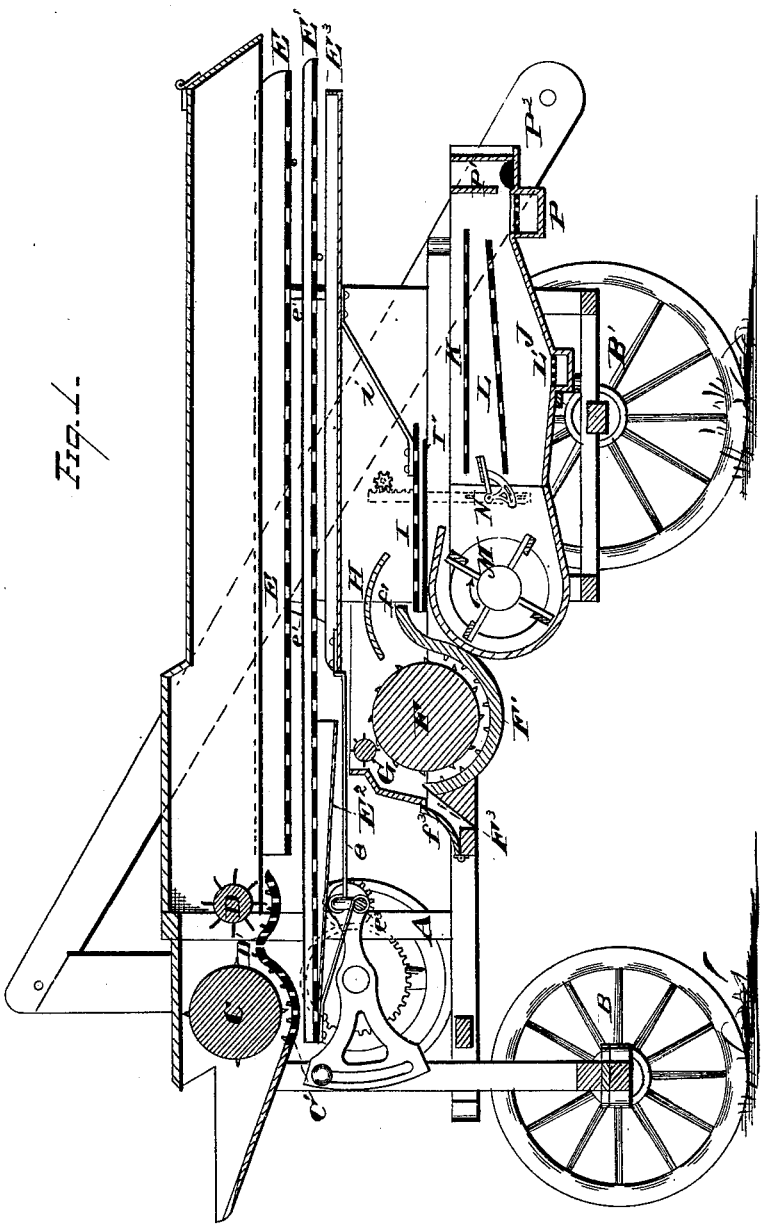
4 Sheets—Sheet 1.

J. C. BIRDSELL.

Clover Thrashing and Hulling Machine.

No. 197,084. **Patented Nov. 13, 1877.**

Fig. 1.



WITNESSES

Ed. S. Nottingham

A. W. Bright.

INVENTOR

J. C. Birdsell,

By Leggett & Leggett,

ATTORNEYS.

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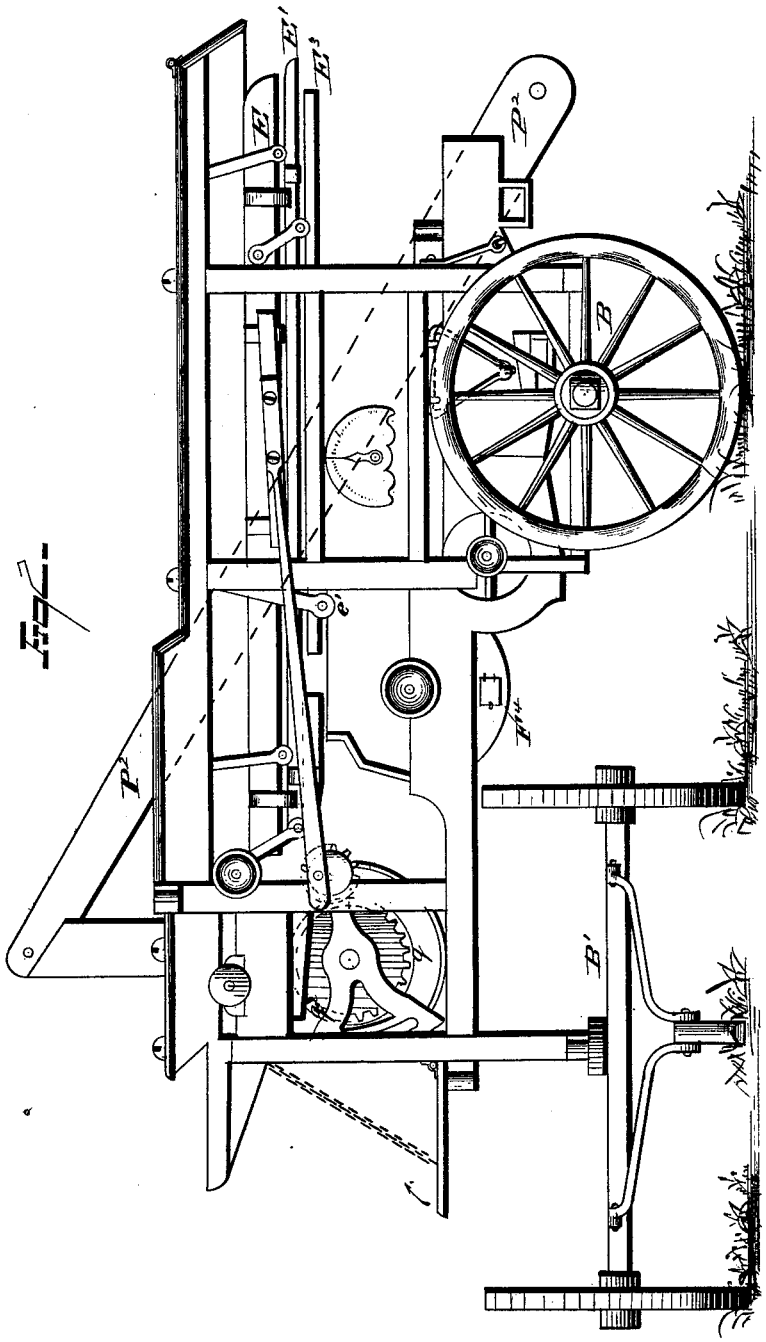

WITNESSES

Ed. L. Nottingham,

A. W. Wright.

INVENTOR

J. C. Birdsell.

By Leggett & Leggett.

ATTORNEYS

4 Sheets—Sheet 3.

J. C. BIRDSELL.

Clover Thrashing and Hulling Machine.

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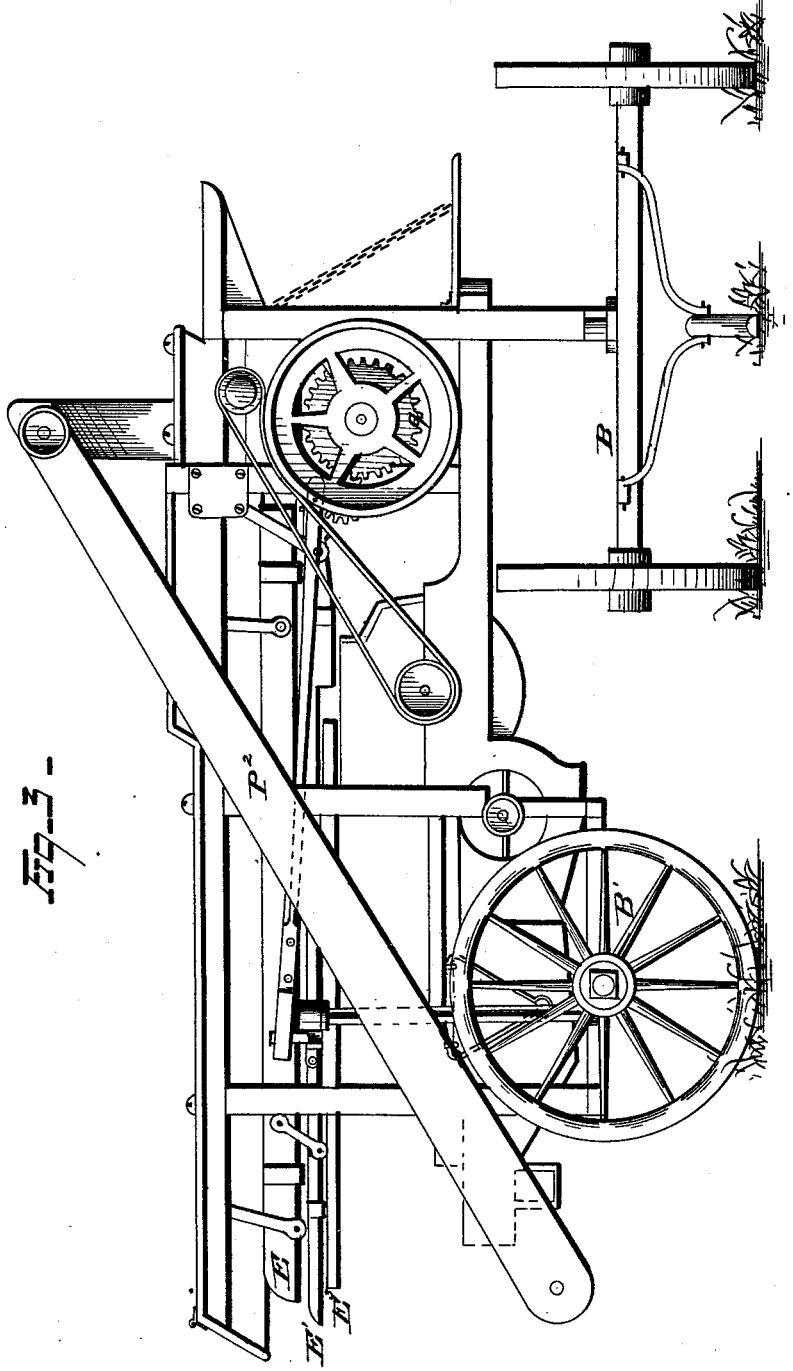

Fig. 3.

WITNESSES

Ed. L. Nottingham

A. W. Bright.

INVENTOR

J. C. Birdsell.

By Leggett & Leggett.

ATTORNEYS

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J. C. BIRDSELL.

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Fig. 4.

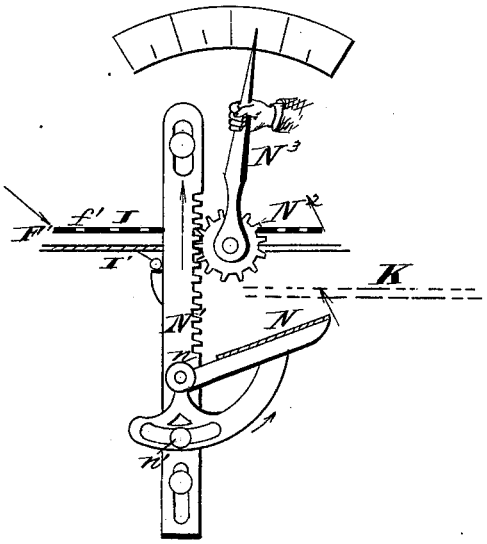


Fig. 6.

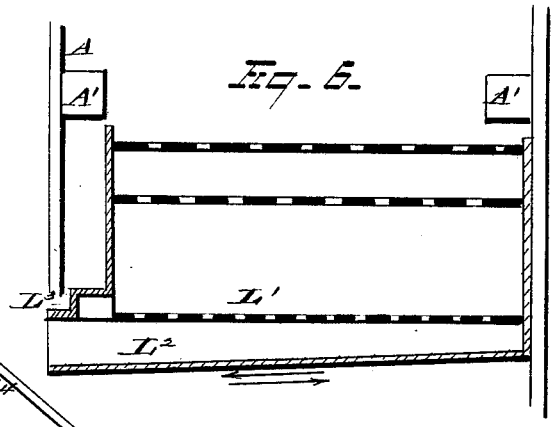
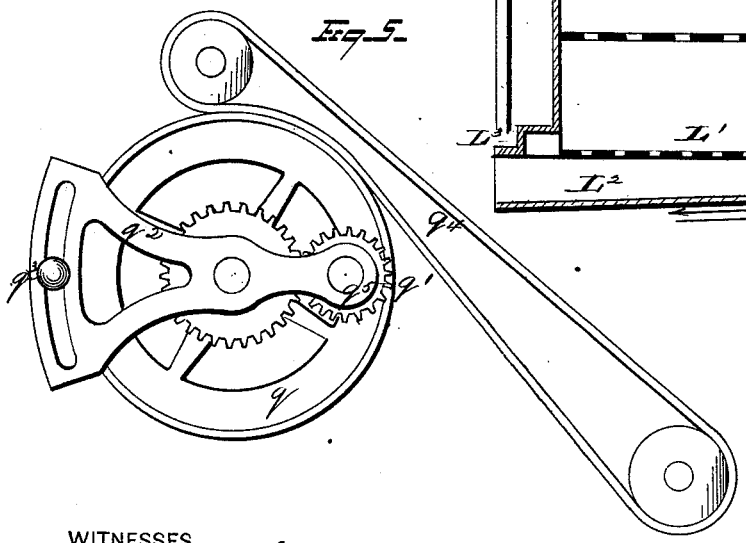


Fig. 5.



WITNESSES

Ed. F. Nottingham

A. W. Bright.

INVENTOR

J. C. Birdsell.

By Seyfett and Seyfett.

ATTORNEYS

UNITED STATES PATENT OFFICE.

JOHN C. BIRDSELL, OF SOUTH BEND, INDIANA.

IMPROVEMENT IN CLOVER THRASHING AND HULLING MACHINES.

Specification forming part of Letters Patent No. **197,084**, dated November 13, 1877; application filed March 29, 1877.

To all whom it may concern:

Be it known that I, JOHN C. BIRDSELL, of South Bend, in the county of St. Joseph and State of Indiana, have invented certain new and useful Improvements in Combined Clover Thrasher, Huller, Separator, and Cleaner; and I do hereby declare the following to be a full, clear, and exact description of the invention, such as will enable others skilled in the art to which it pertains to make and use it, reference being had to the accompanying drawings, which form part of this specification.

My invention relates to improvements in combined clover thrashers, hullers, separators, and cleaners; and consists, first, in the combination, with an agitating-screen and bottom board shorter than the screen, both delivering upon the shoe, of a fan and an adjustable deflector, whereby a greater or less degree of blast is directed upon the lower side of the first or upper screen of the shoe, beneath the point where the chaff and seed are delivered upon the same; second, in the mechanism for adjusting the screen and wind-board, so that as the latter is raised the screen will be simultaneously raised, the same being provided with an index-finger and scale for showing the degree of such adjustment; third, in constructing the front casing of the hulling-cylinder with a box or pocket for catching any hard or unyielding foreign substance that might be carried into the huller, the said pocket being provided with a hinged lid; fourth, in forming a band-wheel on a shaft, which latter gears with, and has a concentric adjustment about, the bolts, whereby the said band-wheel may serve at once as a belt-tightener and to transmit motion to the bolts.

The further particulars of my invention are described farther on in the specification, and pointed out in the final claim.

In the drawings, Figure 1 is a longitudinal central vertical section of the machine; Fig. 2, a side view upon that side having the index; Fig. 3, a side view on that side having the elevator; Fig. 4, an enlarged view of the mechanism employed for regulating the wind-board; Fig. 5, a separate view of the mechanism for making the large band-wheel serve as a belt-tightener. Fig. 6 is a cross-section, showing the relative position of the sills and the shoe.

A is a suitable frame, which may or may not be mounted upon a suitable truck, B B′.

The parts of the machine are so relatively located and constructed, substantially as shown, that the forward truck B may turn to any extent beneath the machine.

C is the thrashing-cylinder; D, one or more picker-rollers, which serve to lighten up the straws after they have been thrashed off by the cylinder C.

E is the upper bolt of the separator, perforated in the usual or in any desired manner. E^1 is the second or lower bolt of the separator, perforated in like manner.

C′ is the concave of the thrashing-cylinder, and D′ a suitable flooring beneath the picker D. Both the concave C′ and the floor D′ are perforated, to permit any heads or seeds to pass through that may have become shaken out from the straw, and permit them to drop upon the bolt E^1 of the separator.

E^2 is a separate solid bottom beneath the forward end of the separator E^1. It terminates over the top of the hulling-cylinder, and conveys whatever may drop upon it into that cylinder.

E^3 is a solid bottom, suspended beneath the rear end of the separator E^1 by suspension straps or hangers e^1, and an alternate forward dropping and receding motion is given to it by the connection or pitman e^2 and the crank e^3. This likewise delivers whatever seeds or chaff may fall upon it into the hulling-cylinder.

F is the hulling-cylinder, and F^1 its concave. G is a picker-roll, which serves to loosen out and distribute the heads uniformly upon the cylinder, and cause the cylinder to take a good bite upon them. The concave F^1 curves over at f^1 the edge of the adjustable screen I.

H is a stripper and deflector, to strip the chaff and seed from the cylinder, and guide them over upon the adjustable screen I. This screen I is a perforated board or an open wire fabric. Immediately beneath it is a solid floor, I′, to collect the siftings of seed, fine chaff, and dust that fall through the screen as the screen is agitated by the arms *i*, which connect it with the floor E^3. This flooring I′ terminates

over the forward end of the upper sieve or riddle K of the shoe J, so as to deliver its charge upon it, while the screen I terminates and delivers its charge a few inches farther back upon the same riddle.

It will thus be seen that the fine chaff and dust are, to a great extent, separated from the coarser chaff, and considerable of the seed gathered before the blast acts upon the coarser chaff at all. This insures a better separation at this point, as the blast can act more directly upon the fine chaff and dust.

J is the shoe, located, as shown, beneath the sills A′ of the frame, preferably so close to them that they may operate to prevent the chaff and seed from dropping over the side of the shoe. The shoe J can thus be made considerably broader than when placed between the sills. It is supported by suspenders attached to the frame, in such a manner, substantially as shown, that the fastenings will not limit its throw, but will permit it to vibrate through the whole breadth of the machine between the uprights, or to the outer surface of the sills. This shoe J is actuated independently of the screen I, and thus the agitating process of the latter is carried on as a separate operating movement from that of the shoe. The two are hence rendered independent of each other, instead of having a joint or common movement, and the process of separation is correspondingly improved, as is apparent.

K is the upper riddle or sieve of the shoe, and L the lower one. M is the fan.

N, a wind-board, located beneath the riddle K, in a position to direct or deflect the blast against the lower side of the riddle, at that point where the contents of the hulling-cylinder are delivered upon it. This wind-board is made adjustable bodily up and down by means of rack-bars N^1, to which it is attached. The rack-bars in turn mesh with gear-wheels N^2, which are operated by an index-arm, N^3, attached to their shaft.

The index-arm marks upon the scale the position of the wind-board, and serves the double purpose of an indicator and appliance or handle for effecting the adjustment.

In addition to the bodily up-and-down adjustment, the wind-board may also be adjusted radially about its heel *n*, or any other suitable device, and the blast may thus be governed so as to exactly suit any character of clover, whether clean or dirty, damp or dry, and whether or not it may have an excess of chaff.

L^1 is a screen, located just over the seed-spout L^2, for catching any chaff or other substance than seed that may possibly fall with the seed, and will hold it within the influence of the blast. Any substance will pass out of the spout L^3.

P is a box and screen for catching stubs, stones, &c., that may pass through, while the tailings will be caught in the box P^1, and be carried back by the elevator P^2 into the thrashing-cylinder C.

F^3 is a trap or pocket communicating with the hulling-concave. It will soon fill with light chaff, but should any hard foreign substance get into the concave, it would be forced into this pocket, crowding back into the concave a corresponding mass of the chaff. This pocket has a door, f^3, from which it may be emptied from time to time, as required.

F^4 is a trap-door or opening, which exposes the cylinder and concave, and enables the operator to see how to properly adjust the concave nearer to or farther from the cylinder.

The screen I is also made adjustable about its forward edges, so that its tail end may be elevated or depressed as it may be desired, to subject its charge to the blast for a greater or less length of time. I prefer, generally, to connect it with the mechanism which adjusts the wind-board, so that as the wind-board is raised the screen I is raised at the same time.

The operation of the machine is substantially as follows: Clover on the straw is fed to the thrashing-cylinder. The heads are here stripped or thrashed from the straw, and the seeds and heads that rattle down may pass through the perforations in the concave or in the flooring between the concave and the picker-roller D. This roller serves to some extent to loosen up and separate the straw from the heads, and delivers the mass upon the upper bolt of the separator. This being agitated, works the straw back out of the machine, but sifts the head through upon the lower bolt of the separator, and thence upon the solid floors beneath the ends of the lower bolt, from whence they pass to the hulling-cylinder. Any hard substances are here caught in the pocket F^3, while the seeds are thoroughly hulled from the bolls or pods, and the mass is ejected upon the adjustable screen I.

If the straw is damp, or especially dirty, the wind-board and screen I are raised up so that the blast can act as long as possible upon it in passing from the adjustable screen I, and at the same time to strike it with a sharp blast beneath the riddle K, under the point where it is received upon the riddle, having previously partially separated the seeds, dust, and fine chaff from the coarse chaff by means of the screen I and the solid floor I′. In passing upon the shoe J the seed and chaff are thoroughly separated, the seed falling into the seed-trough below, while foreign substances are caught by the screen L^1 and guided out at the side of the machine, the tailings being collected and elevated back into the thrashing-cylinder by the elevator.

This construction dispenses entirely with a riddle-belt. The machine is much simplified, rendered more compact and portable, and much more effectual as a combined thrasher, huller, separator, and cleaner.

In order that the large band-wheel *q* that operates the bolts or separator may at the same time operate as a belt-tightener, I poise it upon an arm which moves concentrically with the pinion q^1, into which it meshes; and this arm q^2 may be adjusted up or down, and

set at any desired point, by a set-screw or bolt, q^3, so as to cause the band-wheel to press to any desired extent upon the belt q^4. Instead of the particular slot and set-screw shown for effecting this adjustment, a pawl-and-ratchet device, or rack-and-pinion mechanism, might be employed.

It is frequently desirable to turn the machine from right to left without moving the rear of the machine to any great extent from over the place where the chaff and dust have been delivered. To this end, I so construct the machine that the forward trucks may turn sufficiently far beneath the machine that the machine may be turned to the right about the left hind wheel as a pivot, and vice versa.

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

1. The combination of screen I and the bottom board I′, shorter than the screen, both delivering upon the riddle K of the shoe, with the shoe, the fan, and the adjustable deflector, substantially as described.

2. The combination, with the fan and the riddle K, of the screen I and bottom I′, the said screen projecting beyond the bottom, and having its movement independent of the riddle, and delivering directly upon it, substantially as described.

3. The combination, with the wind-board, of the vertical rack and pinion on the shaft carrying the index-arm, substantially as described.

4. The combination, with the wind-board N, rack-bar N^1, and pinion N^2, of the index-arm N^3, substantially as described.

5. The combination, with the wind-board N, adjustable at its heel, of the rack-bar N^1, pinion, and actuating index-arm N^3, substantially as described.

6. The combination, with the fan and shoe, of the wind-board N, connecting rack and pinion, and index-arm N^3, substantially as described.

7. The combination, with the hulling-cylinder, of the pocket F^3 and hinged door f^3, substantially as described.

8. The combination, with the hulling-cylinder, of pocket F^3, the latter formed in the lower front side of the cylinder-casing, and provided with lid f^3, substantially as described.

9. The combination, with the fan, shoe, and screen I, of the wind-board N, vertical rack-bar N^1, and pinion on the shaft-carrying index-arm N^3, substantially as described.

10. The combination, with the wind-board N, of the vertically-adjustable pivotal support n, the angularly-curved arm provided with slot and clamping-screw or pin n', substantially as described.

11. The combination, with the fan and vibrating upper riddle K, of the wind-board N, rack-bar N^1, pinion N^2, and index-arm N^3, substantially as described.

12. The combination, with the fan and vibrating shoe, of the vertically-adjustable wind-board N, pivoted at n, and the supporting angular arm provided with curved slot and clamp n', substantially as described.

13. The band-wheel q on shaft, said shaft gearing with, and having a concentric adjustability about, the crank-shaft operating the bolts, whereby said band-wheel may serve at once as a belt-tightener, and to transmit motion to the bolts, substantially as described.

14. The combination, with the frame A, of the shoe J, located with its upper edges beneath the main sills A′, and limited to vibrate crosswise of the machine without either edge passing out from beneath the sills, substantially as and for the purposes described.

In testimony whereof I have signed my name to this specification in the presence of two subscribing witnesses.

JOHN C. BIRDSELL.

Witnesses:

FRANCIS TOUMEY,

WM. BEHRENS.