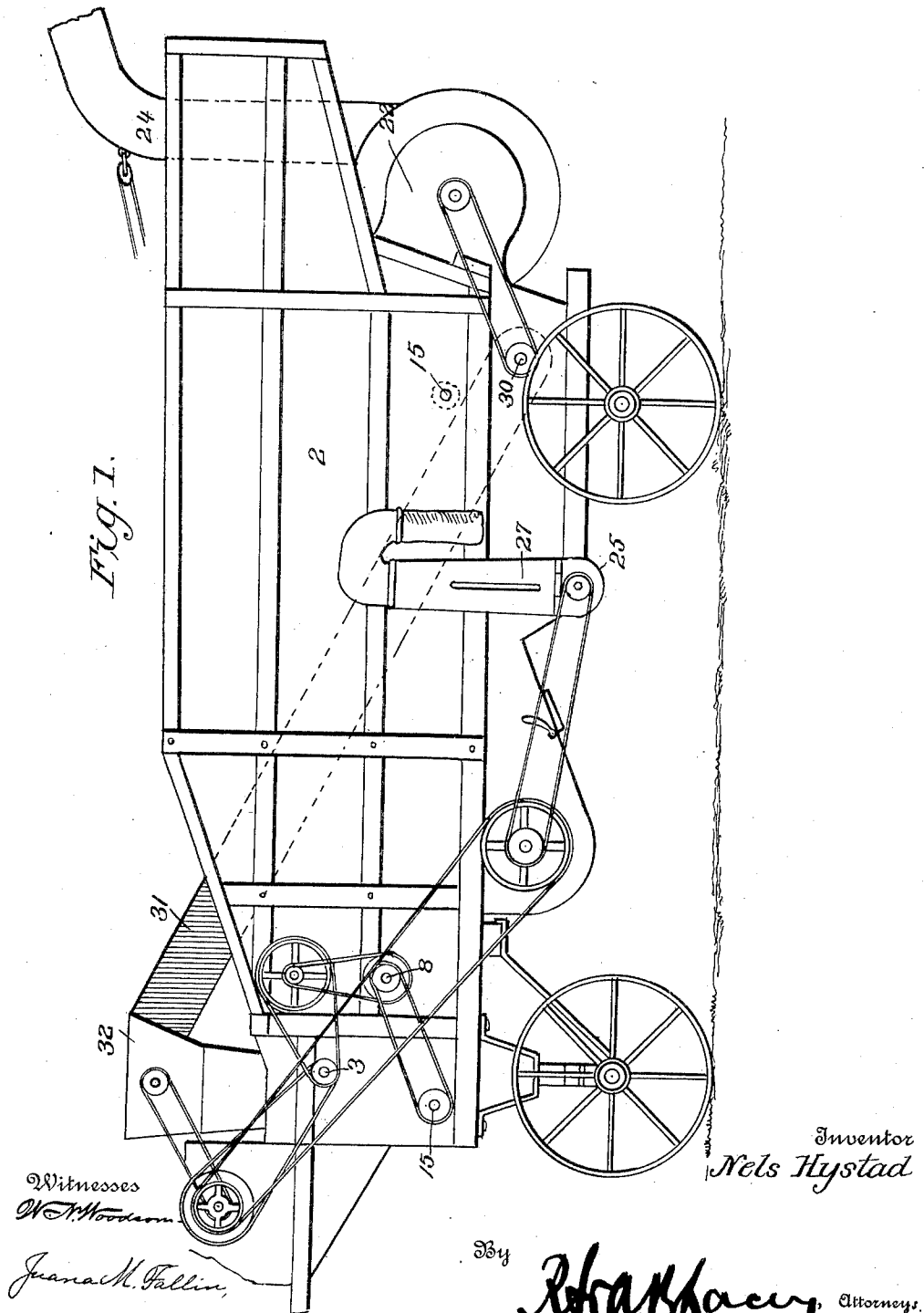


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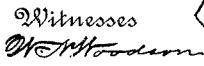
1,009,971.

Patented Nov. 28, 1911.
3 SHEETS—SHEET 1.



1,009,971.

3 SHEETS—SHEET 2.



Juana M. Fallin,

Inventor
Nels Hystad

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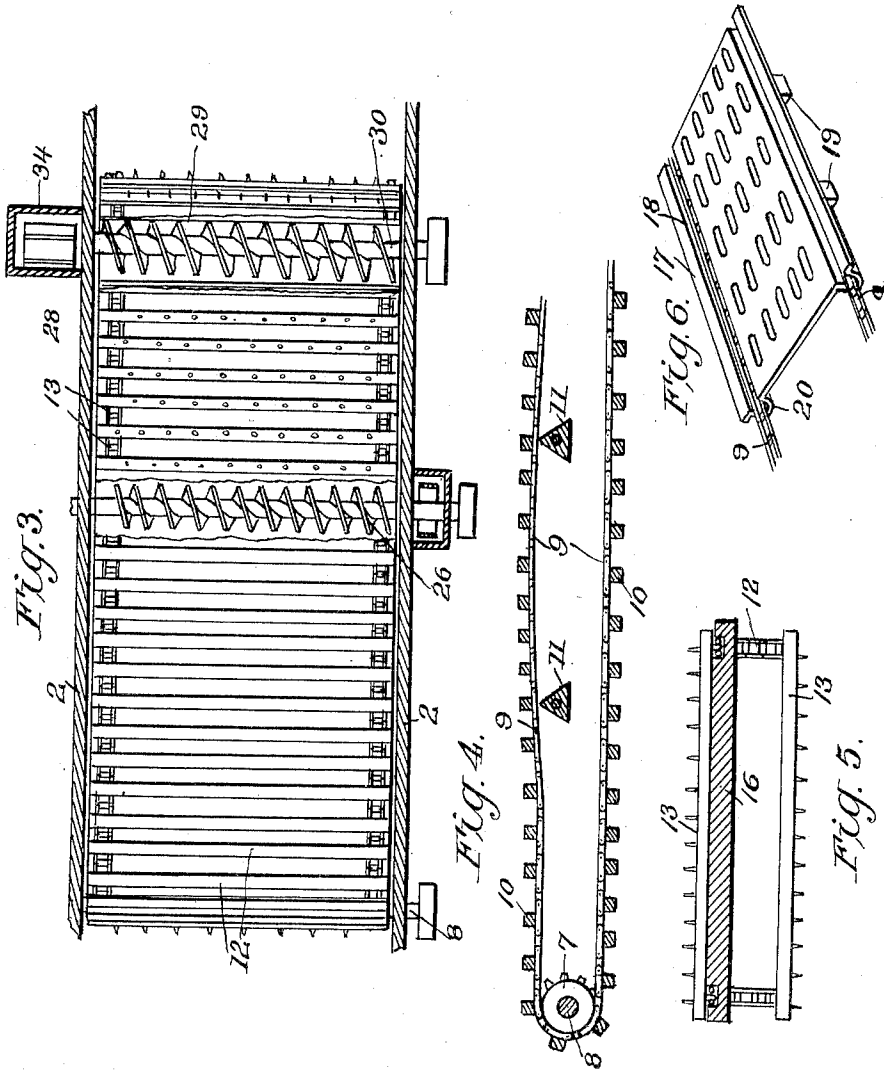
H. B. Macy, Attorneys.

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3 SHEETS—SHEET 3.



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UNITED STATES PATENT OFFICE.

NELS HYSTAD, OF TOLLEY, NORTH DAKOTA.

THRESHING-MACHINE.

1,009,971.

Specification of Letters Patent.

Patented Nov. 28, 1911.

Application filed March 11, 1910. Serial No. 548,690.

To all whom it may concern:

Be it known that I, NELS HYSTAD, citizen of the United States, residing at Tolley, in the county of Ward and State of North Dakota, have invented certain new and useful Improvements in Threshing-Machines, of which the following is a specification.

This invention relates to threshing machines and particularly to the mechanism for separating the grain and chaff from the straw, and separating the chaff from the grain, the object of the invention being to provide an improved means to this end which will thoroughly agitate the straw and grain so that it will be acted upon by the air blast to separate the straw, chaff and grain more thoroughly than is possible under the ordinary construction.

The invention consists, generally speaking, in the provision of upper and lower raddle racks to which the straw and grain are delivered from the beater, one of these raddle racks being given a shaking or oscillating movement so as to separate the grain from the straw, the other rack moving beneath the first named rack and eventually delivering the grain and chaff to a screen. The grain and chaff falls through the screen and the chaff is blown out or toward the rear end of the machine, while the grain falls down into a hopper and is delivered to a conveyer or elevator. All grain which does not succeed in passing through the sieve, or which is carried upon the sieve by the raddle racks is dropped into a second hopper from which it is carried up to the forward end of the machine and again passed through the separating mechanism.

For a full understanding of the invention reference is to be had to the following description and accompanying drawings, in which:—

Figure 1 is a side elevation of my improved thresher. Fig. 2 is a longitudinal vertical section therethrough. Fig. 3 is a plan view of the lowermost raddle rack, showing also the screw-conveyer whereby the grain is delivered to the elevator and delivering mechanism. Fig. 4 is a fragmentary detail section showing the means for oscillating the uppermost raddle rack. Fig.

5 is a transverse section of the line 5—5 of Fig. 2. Fig. 6 is a perspective view of the screen over which the lowermost raddle rack passes.

Corresponding and like parts are referred to in the following description and indicated in all the views of the accompanying drawings by the same reference characters.

Referring to Fig. 2, as more particularly illustrating the general features of my invention, 2 designates the usual inclosing casing of a threshing machine. This has any desired or usual construction and forms no part of my invention. 3 designates the cylinder, 4 the concave, and 5 the beater. These parts are of any ordinary or desired construction and are preferably such as are usually used on threshing machines.

Mounted beneath the beater 5 and extending longitudinally through the casing 2 to the rear end thereof is the raddle rack 6 which is supported upon sprocket wheels 7, these sprocket wheels being mounted on shafts 8 which in turn are driven by any suitable arrangement of belts or gearing from the main drive shaft of the machine. The raddle racks are composed of laterally parallel sprocket chains 9 which are engaged by the sprocket wheel 7 and upon these chains 9 are supported the transverse slats 10 spaced from each other. The space between each two slats should be about two inches. The upper stretch of this chain moves rearward in the direction shown by the illustration in Fig. 2, and the upper stretch of the raddle rack is given a vertical oscillating motion by means of parallel three-cornered or angular jig rolls 11. These rolls are mounted on shafts which in turn are connected to any suitable driving mechanism and as they rotate the upper stretch of the raddle rack will be given a shaking motion which will act to throw the straw and grain upward and thoroughly agitate the same, so that the grain will pass down through the slats 10 of the raddle rack and eventually drop upon the secondary raddle rack 12. This lower raddle rack is constructed in practically the same manner as the raddle rack heretofore described, being composed of spaced slats 13 mounted on

sprocket chains which pass over sprocket wheels 14 on the shafts 15, whereby the sprocket wheels are driven. Located beneath the upper stretch of the raddle rack 12 and extending from the forward end to a point beyond the middle of the raddle rack 12 is the grain pan or board 16.

The movement of the upper stretch of the raddle rack from front to rear acts to scrape or carry the grain rearward over the upper face of the grain pan or board 16, and eventually to carry this grain, and the chaff which may be with it over the screen 17. This screen or sieve is formed in any suitable manner and is shown as being provided with elongated openings 18, and as being supported by means of the transverse bars 19. The screen is provided with the lateral channels or grooves 20 to accommodate the links of the sprocket chain supporting the slats 13. It will be seen that as the second raddle rack passes over the screen the chaff and grain will pass down through the openings 18 and fall upon the lower stretch of the raddle rack passing through the same and into the hopper 20. This hopper has sides which extend entirely beneath the rear end of the secondary raddle rack. As the grain and chaff falls from the lower stretch of the raddle rack, an air blast from the fan 21 will act to carry the chaff rearward and into the compartment 22, the chaff being sucked into this compartment by means of a relatively large fan 23, whereby the straw and chaff will be forced out through the spout 24, the fan 23 and spout 24 forming a pneumatic stacker device of the type usually employed in threshing machines for this purpose. The bottom of the hopper 20 is provided with a transverse channel 25 in which is located a screw conveyer 26 by which the grain is carried laterally and delivered to a delivery spout 27 of any usual approved construction.

Any grain which may not have passed through the openings in the secondary raddle rack is carried over and dropped into a rear hopper 28 which is also provided with a screw conveyer 29 carried on a shaft 30 and driven in any suitable manner, which conveyer carries the grain or any chaff which may have fallen into the rear end of the hopper with the grain laterally, and delivers it to an elevator of the usual type carried within a casing 31, which in turn delivers it to a hopper 32 from which the grain is delivered again to the cylinder and concave 3 and 4. Thus any grain, or any material which may have passed along the lower raddle rack is carried away and once more passed through the machine. In order to direct the blast of air from the fan 21 I provide the deflector 33 which is carried upon a transverse rock shaft 34, whereby the deflector may be directed either against

the forward end of the screen 17 or against the rear end thereof. It will be seen that not only is the air directed so as to pass beneath the lower stretch of the raddle rack 12, but is also directed against the raddle rack so as to more fully separate the chaff from the grain.

It will be seen that by this I have provided a very simple and yet effective form of threshing machine in which the straw and grain are thoroughly agitated so as to shake the straw up thoroughly and separate the grain therefrom. In effect the upper raddle rack constitutes a longitudinally movable and vertically oscillating sieve and agitator, while the secondary or lower raddle rack not only acts to detach the chaff from the grain by moving the grain along the upper face of the plate 16, but also acts as a conveyer whereby the grain and chaff are carried to the screen.

By reason of the continuous movement of the endless raddle racks from front to rear, there is no chance of the machine becoming clogged. The straw will be carried rearward continuously instead of intermittently, as is usual in devices of this character. Furthermore the endless raddle racks form practically four sets of slatted screens, thus acting to thoroughly separate the grain from the straw and from extraneous particles, and also acting to thoroughly detach the chaff from the grain before it is submitted to the action of the blast of air from the blower 21.

While I have shown what I regard to be the preferable details of this construction, I do not wish to be limited to that, as it is obvious that many changes may be made without departing from the spirit of the invention.

Having thus described the invention what is claimed as new is:—

1. In a grain separator, a grain board, a screen in alinement with the grain board, a raddle mounted for orbital movement about the grain board and screen, a fan arranged to discharge an air blast through the screen and the upper and lower runs of the raddle, and an open work barrier mounted for movement above the raddle with its lower part movable in a direction opposite to the direction of movement of the upper run of the raddle and adapted to repel material toward the raddle against the lifting action of the blast.

2. In a grain separator, a grain board, a screen in alinement with the grain board, a raddle mounted for orbital movement about the grain board and screen and having spaced slats which move along the upper surfaces of the grain board and screen in contact therewith, a fan arranged to discharge an air blast through the screen and the upper and lower runs of the raddle, and

an open work barrier mounted for movement above the raddle with its lower part movable in a direction opposite to the direction of movement of the upper run of the
5 raddle and adapted to repel material toward the raddle against the lifting action of the blast.

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

NELS HYSTAD. [L. S.]

Witnesses:

J. M. HYNES,
AL HESS.

Copies of this patent may be obtained for five cents each, by addressing the "Commissioner of Patents, Washington, D. C."
