No. 727,358. PATENTED MAY 5, 1903.

N. E. HEIEREN.

THRESHING MACHINE.

APPLICATION FILED MAY 17, 1902.

NO MODEL. 2 SHEETS—SHEET 1.

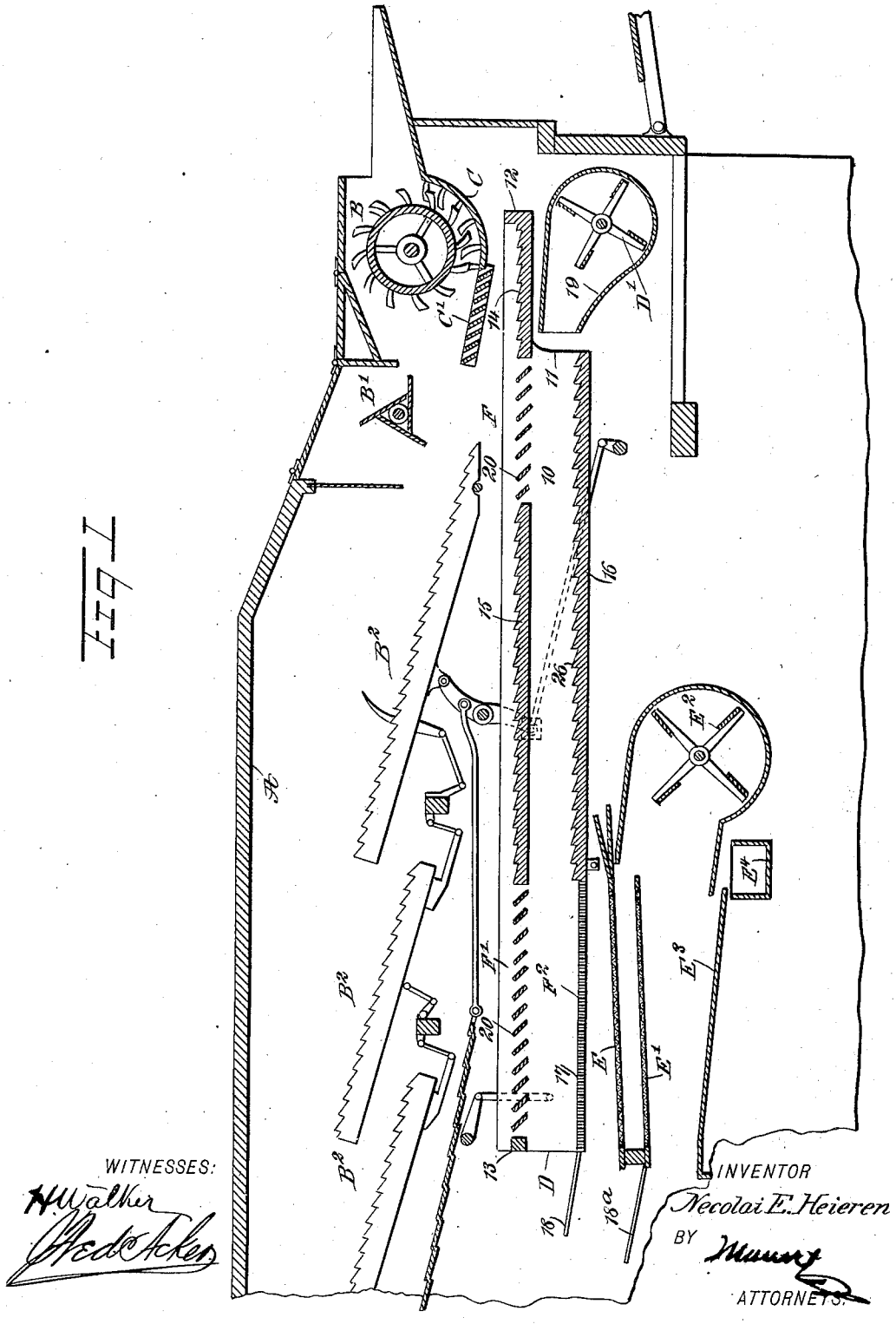


FIG. 1.

WITNESSES:

H. J. Walker

Fred C. Ackers

INVENTOR

Nicolai E. Heieren

BY Munn & Co.

ATTORNEYS.

THE NORRIS PETERS CO., PHOTO-LITHO., WASHINGTON, D. C.

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NO MODEL. 2 SHEETS—SHEET 2.

Fig 2

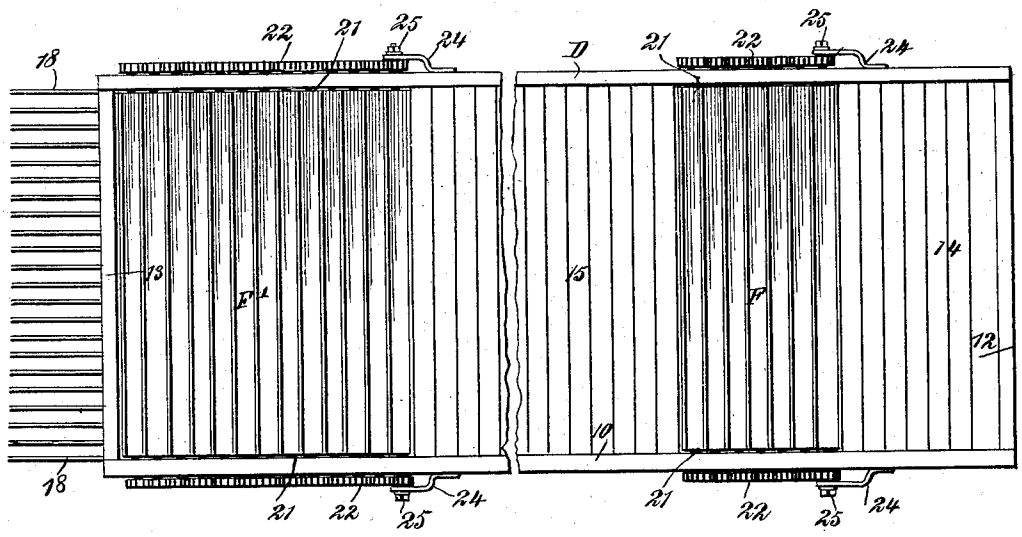


Fig 3

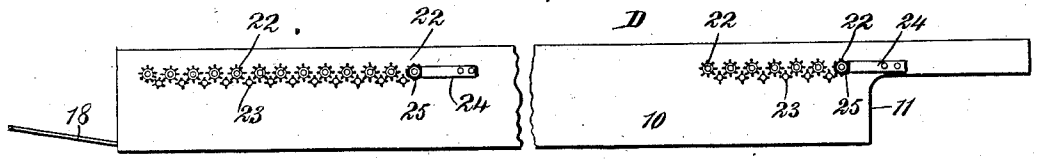
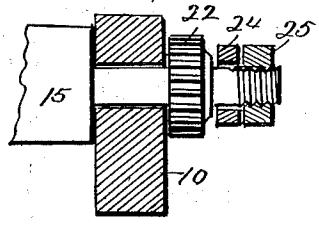


Fig 4



WITNESSES:

M. Walker

J. Wedderburn

INVENTOR

Nicolai E. Heieren

BY

Munn & Co.

ATTORNEYS.

THE NORRIS PETERS CO., PHOTO-LITHO., WASHINGTON, D. C.

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UNITED STATES PATENT OFFICE.

NECOLAI E. HEIEREN, OF BAXTER, MINNESOTA.

THRESHING-MACHINE.

SPECIFICATION forming part of Letters Patent No. 727,358, dated May 5, 1903.

Application filed May 17, 1902. Serial No. 107,771. (No model.)

To all whom it may concern:

Be it known that I, NECOLAI E. HEIEREN, a citizen of the United States, and a resident of Baxter, in the county of Lac qui Parle and State of Minnesota, have invented a new and Improved Threshing-Machine, of which the following is a full, clear, and exact description.

My invention relates to an improvement in threshing-machines, and the purpose of the invention is particularly to so improve upon the old form of grain-pan that such pan is provided near its receiving and discharge end with adjustable chaffers and intervening feed-surfaces, which adjustable chaffers and communicating feed-surfaces are independent of and above the usual fixed chaffers and feed-surfaces forming the bottom of the customary grain-pan, whereby should any grain be fed forward with the chaff from the first series of chaffers such chaff containing grain will be compelled to pass over the second series of chaffers before the chaff is thrown off on the chaff heap.

Another purpose of the invention is to render the auxiliary chaffers of the grain-pan readily adjustable, so that such chaffers may be arranged for successful operation with any character of grain and under all conditions necessary to the perfect separation of grain from the chaff.

A further purpose of the invention is to locate the fan below the forward end of the grain-pan in such manner that the blast of air therefrom is directed into the grain-pan and upward through the spaces between the adjustable chaffer-slats.

The invention consists in the novel construction and combination of the several parts, as will be hereinafter fully set forth, and pointed out in the claims.

Reference is to be had to the accompanying drawings, forming a part of this specification, in which similar characters of reference indicate corresponding parts in all the figures.

Figure 1 is a vertical longitudinal section through a portion of the threshing-machine having the improvement applied. Fig. 2 is plan view of the improved grain-pan, and Fig. 3 is a side elevation of the same. Fig. 4 is a detail sectional view of the device for imparting movement to the chopper-slats.

The grain-pan D extends from a point below the concave to a point at or near the rear end of the casing A and is mounted to reciprocate in the usual manner. The improved grain-pan D consists of side pieces 10, which are of much greater transverse width than is customary in the construction of a grain-pan, and at the forward end of each grain-pan a recess 11 is made in the under edge of each side piece 10. The side pieces are connected at the front of the pan by a transverse bar 12, and at the rear the side pieces are connected near their upper edges by a cross-bar 13, as is best shown in Fig. 1. A feed-floor 14 for chaff and grain is constructed at the forward end of the grain-pan, extending from side to side thereof at the upper horizontal walls of the recesses 11 at the forward ends of the side boards of said pan, as is also best shown in Fig. 1, and the said feed-floor 14 is preferably made to connect with the forward end bar 12 of the grain-pan. Adjacent to the inner end of the forward feed-floor 14 an adjustable chaffer F is carried by the side pieces of the grain-pan, and adjacent to the rear portion of this adjustable chaffer F a second and longer grain-floor 15 extends from one side board to the other of the grain-pan, and between this second feed-floor 15 and the rear cross-bar 13 a second adjustable chaffer F′ is located in the said pan. The bottom of the grain-pan consists of the usual feed-floor 16, which extends from the forward recessed end of the side boards 10 of the grain-pan to a point beyond the center of said side boards, the rear end of the bottom feed-floor 16 being in communication with a fixed chaffer F^2, constituting the remaining portion of the bottom of the grain-pan, which fixed chaffer F^2 consists of a series of slats, metal or wood, rigidly attached to the said side bars 10, as is best shown in Fig. 1.

The usual straw-carriers 18 extend out from the bottom of the grain-pan D at its rear end, and each adjustable chaffer F and F′ consists of a series of slats 20 of desired width arranged one after the other and close enough so that in the horizontal positions of the slats

the slats of a series will overlap one another. Each slat 20 is provided at each end with a trunnion 21, said trunnions being loosely mounted in the side pieces 10 of the grain-pan, extending out beyond the outer faces of said side pieces, as is illustrated in Figs. 2 and 3. Each trunnion 21 has secured to its outer end a gear 22; but the gears of the various trunnions at each side of the grain-pan are placed so far apart that they cannot mesh; but motion from one of a series of gears 22 is imparted to all of the gears of the same series through transmitting spur-gears 23, which spur-gears are idlers and are mounted on suitable spindles between opposing gears 22, meshing with said gears and thus communicating motion from one gear to the other. The trunnions of the first slats 20 of a series are made to extend beyond the outer faces of the attached gears 22, and the outer ends of said trunnions are made to pass through apertures in brackets 24, secured to the outer faces of the side pieces 10 of the grain-board, and the projecting ends of the said trunnions of the first slats of a series are threaded to receive nuts 25. When the slats 20 are to be adjusted, the nuts 25 are removed, and the trunnions carrying them are turned by hand or by means of a suitable tool, and as the first slat of a series is moved corresponding movement is simultaneously given to all of the other slats of the series through the medium of the chain of gears heretofore described. After the slats have had proper adjustment the nuts 25 are again screwed to place against the brackets 24, holding the slats in their adjusted position.

A fan D′ is located in a suitable casing 19 below the forward feed floor or table 14 of the grain-pan D, and the outlet end of the casing 19 for the fan D′ is directed to the interior of the grain-pan D at the open portion of its forward end. The said fan-casing 19 is so placed that the blast of air delivered therefrom to the grain-pan will pass up through the spaces between the slats 20 of the adjustable chaffers F and F′.

The usual sieves or screens E and E′ are located below the fixed chaffer F^2, forming a portion of the bottom of the grain-pan E, and these sieves or screens are provided with the usual straw-carriers 18^a. (Shown in Fig. 1.) In conjunction with the sieves E and E′ a fanning-mill E^2 is employed, and the grain delivered from the screens or sieves E and E′ is received upon a table E^3, from whence the grain is delivered into a suitable trough or conveyer E^4.

It will be understood that each feed conveyer or table 14, 15, and 16 of the grain-pan is provided with the usual series of transverse teeth 26, having an upward and a rearward inclination.

A threshing-machine equipped with the improved grain-pan cannot become overcrowded on the sieves, as the two adjustable auxiliary chaffers F and F′ carried by the grain-pan entirely prevent such an occurrence. The chaffers F and F′ are made adjustable, so that more or less wind may be directed to the grain and chaff while passing over the auxiliary chaffers F and F′ and also so that the grain-pan will act with the best possible results on different characters of grain, since it is desirable in the treatment of some grain to have wide openings between the chaffer-slats 20, while in the treatment of other grain such openings between the slats should be quite small. Furthermore, by reason of the adjustability of the slats of the auxiliary chaffers F and F′ the bulk of the air-blast may be directed to the sieves or screens E or E′ should the operator deem such concentration of the air-blast desirable or needful.

The advantage obtained in having the grain separated from the chaff at different points in its passage over the grain-pan instead of effecting this separation throughout the whole distance of its movement through the grain-pan, as is customary, is that the grain-pan is prevented from becoming clogged and more satisfactory results are obtained, since the grain is received on the first feed-table 14 of the chaffer-section of the grain-pan and is naturally fed to the grain-pan free from chaff. The chaff and grain are delivered upon the first series of chaffer-slats F, between which the burden of the grain falls, and a minimum of chaff next the chaff with more or less accompanying grain passes upon the second feed-table 15, and in the passage of the material over this table the grain has a chance to leave the chaff, while the chaff is prevented from entering the grain-pan, and the consequence is that when the material reaches the rear set of chaffer-slats F the freed grain drops through clean and in bulk, while the chaff passes quickly over the second series of slats and but little falls into the pan, as at this point the material is subjected to the influence of the main fan E^2, but any grain which may still remain in the chaff is free to drop into the grain-pan.

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

1. In a threshing-machine, a grain-pan provided with adjustable chaffers, consisting of a series of pivoted slats located near the front and rear of the pan above the bottom, fixed feed-tables in the same plane with the adjustable chaffers, one feed-table being at the front of the pan and the other intermediate the chaffers, and exteriorly-operated shifting devices for the chaffers, the shifting devices for each chaffer operating to simultaneously move all the slats thereof in the same direction, as described.

2. In a threshing-machine, a grain-pan pro-

vided with adjustable chaffers consisting of a series of pivoted slats located near the front and the rear ends of the pan above its bottom, fixed feed-tables, one separating the adjustable chaffers from each other and the other feed-table located next the receiving end of the grain-pan, gears secured to the trunnions of the chaffer-slats, spur-gears meshing with the slat-gears, constituting chains of gearing, and means for locking the gears against turning, substantially as described.

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

NECOLAI E. HEIEREN.

Witnesses:
W. BROWN,
C. A. FOSNES.