

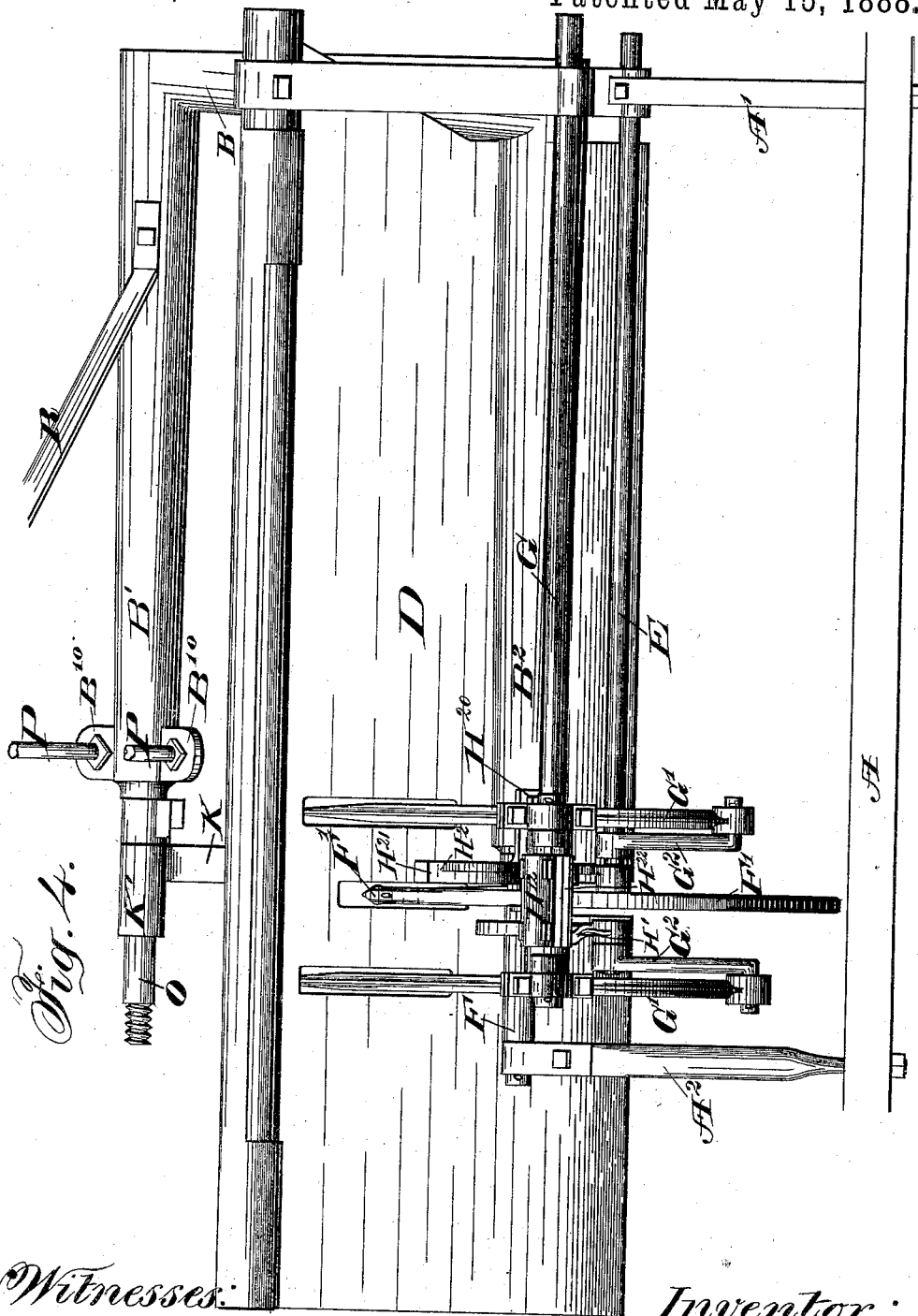
(No Model.)

J. F. STEWARD.
GRAIN BINDER.

4 Sheets—Sheet 2.

No. 382,842.

Patented May 15, 1888.



Witnesses:

H. Kaspari.
C. R. Moore

Inventor:

John F. Steward.

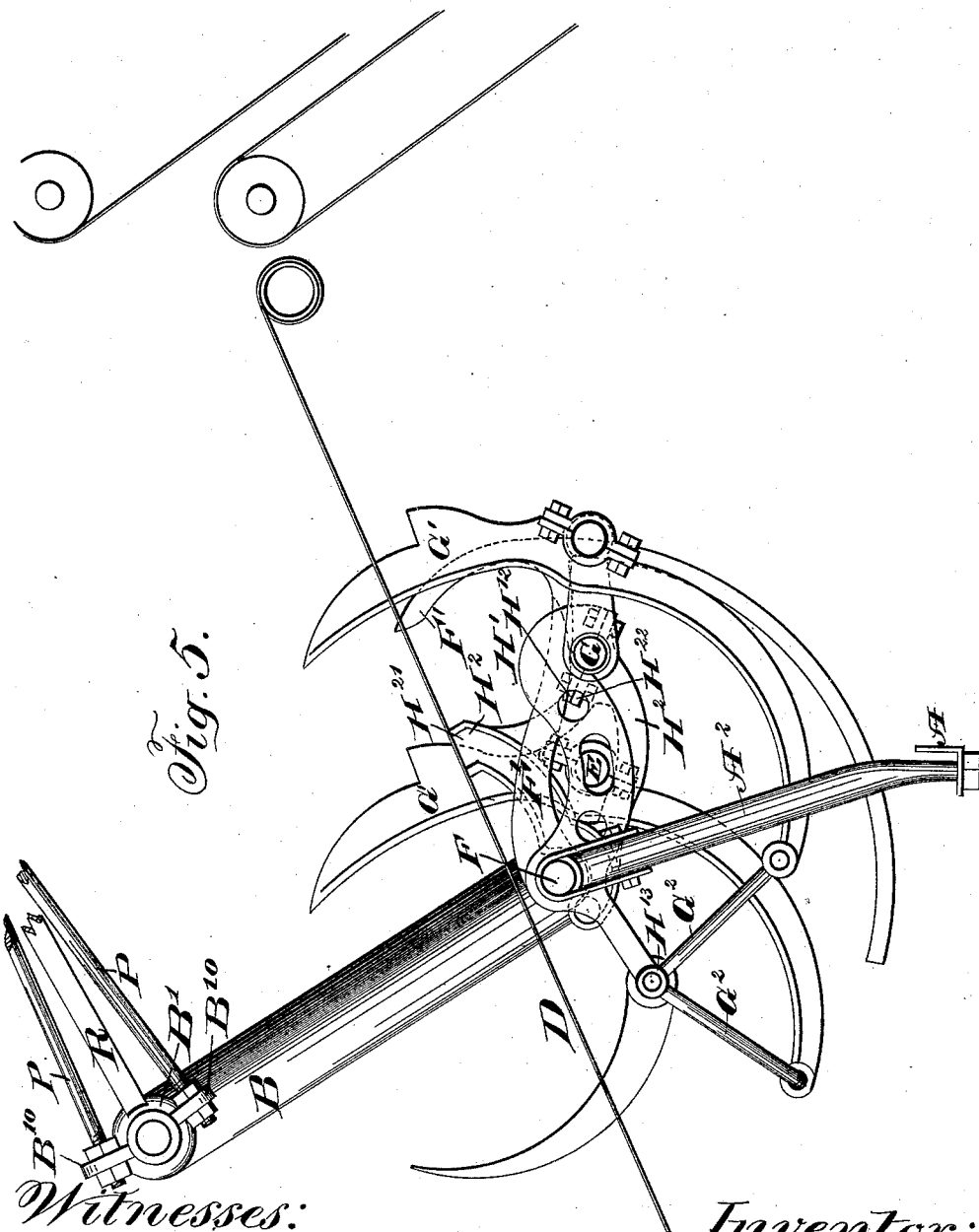
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J. F. STEWARD.
GRAIN BINDER.

4 Sheets—Sheet 3.

No. 382,842.

Patented May 15, 1888.



Witnesses:
A. Knappe,
E. R. Munn.

Inventor:
John F. Steward,

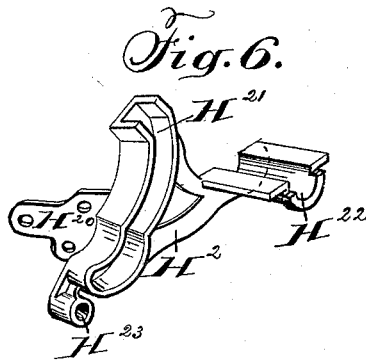
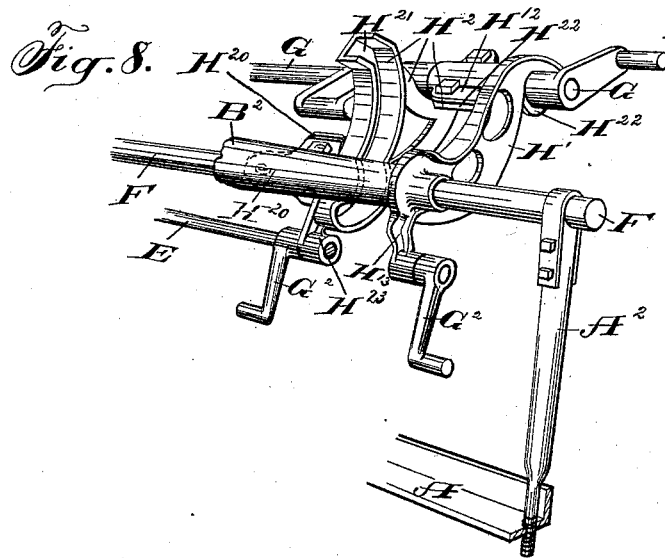
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4 Sheets—Sheet 4.

J. F. STEWARD.
GRAIN BINDER.

No. 382,842.

Patented May 15, 1888.



Witnesses:
John B. Maspari.
John H. Vetterstrom.

Inventor.
John F. Steward.
By His Attorneys.
Burton & Burton.

UNITED STATES PATENT OFFICE.

JOHN F. STEWARD, OF CHICAGO, ILLINOIS.

GRAIN-BINDER.

SPECIFICATION forming part of Letters Patent No. 382,842, dated May 15, 1888.

Application filed November 23, 1887. Serial No. 256,293. (No model.)

To all whom it may concern:

Be it known that I, JOHN F. STEWARD, a citizen of the United States, residing at Chicago, in the county of Cook and State of Illinois, have invented certain new and useful Improvements in Grain-Binders, which are fully set forth in the following specification, reference being had to the accompanying drawings, forming part thereof.

Figure 1 is an outer side elevation of a binder-frame, showing a portion of my invention above the deck. Fig. 2 is a detail front elevation of a part of a binder-frame, showing the same part of my invention which appears in plan in Fig. 1. Fig. 3 is a detail plan of a part of the upper arm of a binder-frame and certain braces therefrom which pertain to my invention. Fig. 4 is an inner side elevation, looking at the under side of the deck, of a binder-frame and part of the mechanism thereon. Fig. 5 is a front elevation of a binder-frame, showing part of my invention which is located below the deck. Figs. 6 and 7 are perspectives, respectively, of two brackets, which have mated halves of a journal-box for the packer-shaft, and certain other bearings pertaining to my invention. Fig. 8 is a perspective of the portions of the frame and brackets secured thereto underneath the deck.

The general purpose of this invention is to diminish the amount of frame-work which is necessary to support the various parts of a binder-frame. It comprises two parts—the devices which support the breast-plate and knotter-frame and devices which support the packer-shaft and other parts below the deck.

A represents a main bar of the harvester-frame.

B is the binder-gear standard, having the usual overhanging arms, B' and B², and with them constituting the principal part of the binder-frame.

A' represents a bracket or post which is supported on the main frame, and in turn supports the rear end of the binder-frame.

A² is a bracket secured to the bar A and extending upward, leaning somewhat outward, and having at the upper end a bearing for the forward end of the needle rock-shaft, which is journaled, as usual, in the lower arm, B², of the binder-frame.

D is the deck.

E is the trip rock-shaft.

F is the needle rock-shaft.

F' is the needle.

G is the packer crank-shaft.

G' G' are the packers.

G² G² are the packer guide-links.

H' H² is a compound bracket, made up of two simple brackets, which have, respectively, the upper and lower halves of a journal-bearing for the packer-shaft. The bracket H² is secured by means of the wing or seat H²⁰ to the under side of the arm B² of the binder-frame. This bracket also has formed integral with it the tucker-cam H²¹, of familiar form and function. The half of the packer-shaft journal-box H²², which is formed on the bracket H², opens upward and supports the packer-shaft. This bracket also supports the bracket H' in part, the half H¹² of the packer journal-box which pertains to the bracket H' lying upon and being bolted fast to the half H²². The bracket H' has the bearing H¹¹, which receives the needle rock shaft F, which further supports said bracket. The bracket H² has a bearing, H²³, for the trip rock-shaft E, and the bracket H' has in line with the bearing H²³ and with the trip shaft E the eye H¹³, which receives the pivot of the link G² connected with the forward packer. The corresponding link G², connected with the rear packer, is pivoted on the trip rock-shaft E.

Upon consideration of this structure it will be noticed that the needle rock-shaft F, being journaled in the arm B² of the binder-frame and having a journal-bearing at the forward end in the post or bracket A², which is supported directly on the main frame, affords support for the forward end of the binder-frame and dispenses with any other support at that end. Next, that the bracket H², being secured rigidly to the same lower arm, B², of the binder-frame, affords positive support for the packer-shaft and dispenses with the necessity for any other bearing for that shaft forward of the binder-gear standard. Also, that the bracket H', having the eye-bearing H¹¹, through which the needle rock-shaft passes, gains support from said shaft, and, being bolted fast to the bracket H², further assists the support of that bracket, so that the needle rock-shaft is made the medium of transmitting the support afforded by the bracket or post A² to

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the packer-shaft. Also, that the packer-links are pivoted in line with the trip rock-shaft, and that shaft is utilized as the pivot of one of them. Also, that the brackets H' and H², being rigidly secured together, are, in effect, as described, a single compound bracket, which is supported by connection with the lower arm of the binder-frame and with the needle rock-shaft.

Above the deck the knotter-frame K, breast-plate L, and grain-check springs M M M require support. The knotter-frame is provided, as usual, with a sleeve, K', by means of which it is hung upon the binder-shaft O. The breast-plate is secured to the knotter-frame, as usual. The bar N, called hereinafter the "check-spring" bar, is secured to the inner end of the breast-plate, and the grain-check springs M M M are secured to and coiled around it. Heretofore it has been customary to support this bar at the rear end or at the forward end, and sometimes at both ends, upon the binder-gear standard or other support, reaching down by some means to the base-support of the binder-frame. I aim to dispense wholly with such end support and provide it sufficient support at or near the middle to uphold the inner end of the breast-plate and keep the knotter-frame in proper position, and also to hold the check-springs. For this purpose I form said bar N only long enough to enable it to hold the check-springs in their proper places with respect to the height of the grain, and while the end portions are preferably rounded, as illustrated, to facilitate the action and reaction of the springs coiled about them, I prefer to leave the intermediate portion square, or at least polygonal, to facilitate securing to it the braces P P, which are each secured at one end into one of the lugs B¹⁰, which project from the arm B' of the binder-frame, one projecting upward and the other downward, so that the points at which said braces P P are secured are several inches apart. Said braces extend inwardly above the deck, approaching each other in a vertical plane, and are both united to the bar N, being, preferably, also secured to each other by the same bolts which unite them to said bar, and to give them very firm attachment to said bar they are flattened at their inward portion, though preferably round throughout their remaining extent, and such flattened portion is bent at right angles to the remainder and forms a foot, to which the bar N is secured. The distance by which the ends of said braces are separated at the binder-frame arm B' renders them, when thus joined at their inner ends as a bracket, very stiff in a vertical plane, and such plane (the plane in which they extend from the arm B' to said bar N) being about midway in the length of the bar, or midway between the foremost and rearmost pressure exerted by the grain to distort or move the bar N and the breast-plate, the knotter-frame is in the best position to resist such strain and pressure. In order to enable it to resist pressure in horizontal direc-

tion also, the brace R is provided, which is also secured to the bar N by a flat foot, R', which is secured to the bar, preferably, by the same bolts which fasten one or both of the braces P, the rear end of said brace R being bolted fast to the arm B' of the binder-frame well toward the rear, near the gear-standard B. These three braces, formed, as described, with broad or extended fastenings to the bar N and bracing each other, as the legs of a tripod, give the bar N rigid fixedness of position, and being thus securely joined to it near its middle render any end supports for it needless.

It will be obvious that the braces may be connected to the breast-plate without the intervention of the bar N, and in the structure shown they should be considered as in reality connected to the breast-plate to uphold it, the said bar N being a convenient medium of connection, being necessarily located in the vicinity and itself rigidly braced to hold the grain-check springs M M M.

I claim—

1. In combination with the harvester main frame, the binder-frame, the needle rock-shaft journaled in said binder-frame, and a post or bracket, as A², supported on the main frame and having a bearing for the needle rock-shaft, whereby the binder-frame receives support through the needle rock-shaft, substantially as set forth.

2. In combination with the harvester main frame and the binder-frame comprising a rigid arm, as B², the needle rock-shaft journaled in said arm and protruding from the end of it, and a rigid post or bracket, as A², on the main frame, having a bearing in which the protruding end of the needle rock-shaft is journaled, substantially as and for the purpose set forth.

3. In combination with the binder-frame having a rigid arm, as B², the needle rock-shaft journaled in said arm, and having the needle at one end of said arm, the packer crank-shaft having its cranks located one on each side of the vertical plane of the needle, and the bracket H², secured to the arm B² and having a journal-bearing for the packer crank-shaft between the cranks, substantially as set forth.

4. In combination with the binder-frame and the packer crank-shaft, a bracket, as H², secured to the binder-frame and having a bearing for the packer crank-shaft between its cranks, and having also a bearing for the trip-shaft, substantially as set forth.

5. In combination with the binder-frame, the needle rock-shaft journaled in an arm thereon, a rigid bracket secured to the said arm and hung on said rock-shaft, and having a bearing for the packer crank-shaft, substantially as set forth.

6. In combination with the binder-frame and the needle rock-shaft journaled in an arm thereof and carrying the needle located at the end of such arm, and protruding beyond said

needle, a bracket, as H' H^2 , having a journal-bearing for the packer crank-shaft and extended from such bearing in two arms, one on each side of the vertical plane of the needle, one of them being secured to the binder-frame arm and the other supported on the protruding end of the needle rock-shaft beyond the needle, substantially as set forth.

7. In combination, substantially as set forth, the binder-frame, needle rock-shaft, packer crank-shaft, and the bracket composed of the parts H' and H^2 , each part having a portion of a journal-box for the packer-shaft, one part, H' , being supported on the needle rock-shaft and the other part, H^2 , being secured to the binder-frame, substantially as set forth.

8. In combination with the binder-frame, the bracket H^2 , secured to the lower arm of said frame, the trip-shaft and the packer-shaft each having bearings therein, the packer, and the packer guide-link having the trip shaft as its pivot, substantially as set forth.

9. In combination with the binder-frame, the packer crank-shaft and the trip-shaft having their bearings rigid therewith, the packer journaled on the crank-shaft wrist, and the packer guide-link pivoted to the packer and having its other pivot on the trip-shaft, substantially as set forth.

10. In combination with the binder-frame, the bracket H^2 , secured to the lower arm of said frame, having the tucker-cam integral with it, and having the bearing for the packer-shaft, substantially as set forth.

11. In combination with the binder-frame, the bracket H^2 , secured to the lower arm of said frame, having the tucker cam integral with it, and having the bearing for the trip-shaft, substantially as set forth.

12. In combination with the binder-frame, the bracket H^2 , secured to the lower arm of said frame and having the tucker-cam integral with it, and having the bearings for the packer-shaft and the trip-shaft, substantially as set forth.

13. In combination with the binder-frame, the needle rock shaft journaled in its lower arm, the brackets H' and H^2 , rigidly joined, one of them being secured to the binder-frame arm and the other being hung upon the needle rock-shaft, and the trip-shaft having a bearing in one of said brackets, substantially as set forth.

14. In combination with the binder-frame, the needle rock-shaft journaled in its lower arm, the brackets H' and H^2 , rigidly joined, one of

them being secured to the binder-frame arm and the other being hung upon the needle rock-shaft, the packer crank-shaft journaled in one of said brackets, the packers pivoted on the cranks of said shaft, and the packer guide-links having one end pivoted to the packers, respectively, and the other end pivoted to said brackets H' and H^2 , respectively, substantially as set forth.

15. In combination with the binder-frame arm B' , the braces $P P$, secured to said arm and extended thence inward and rigidly secured at approximately the same point to the bar N , said bar terminating free of support at both ends, and the grain-check fingers $M M$, secured to said bar, substantially as set forth.

16. In combination with the binder-frame arm B' , the binder-shaft O , journaled therein, the knotter-frame K , supported on the protruding portion of said shaft, the breast-plate secured to the lower part of the knotter-frame and extending inward, the braces $P P$, secured to the arm B' and extending thence inward and rigidly connected with the inward part of the breast-plate, and the bar N , rigidly secured both to the breast-plate and to both said braces and terminating free of other support at both ends, substantially as set forth.

17. In combination with the binder-frame arm B' , the braces $P P$, rigidly secured to the said arm, one on the upper and the other on the lower side thereof, and extended thence inward and bent at their inner ends to form a foot on each, and the bar N , rigidly secured to such feet and extending both ways therefrom and terminating free of other support at both ends, and the grain-check fingers secured to said bar, substantially as set forth.

18. In combination with the binder-frame arm B' , the braces $P P$, rigidly secured to said arm, one on the upper and the other on the lower side thereof, and extended thence inward and bent at their inner portion to form feet at an angle with their remaining portion, the bar N , rigidly secured to said feet and terminating free of other support at both ends, the binder-shaft journaled in the arm B' , the knotter-frame hung upon its protruding portion, and the breast-plate secured to the knotter-frame and to the bar N , substantially as set forth.

JOHN F. STEWARD.

Witnesses:

MATHIAS KASPARI,
C. L. MOSS.