

(Model.)

3 Sheets—Sheet 1.

W. N. WHITELEY.

GRAIN BINDER.

No. 376,123.

Patented Jan. 10, 1888.

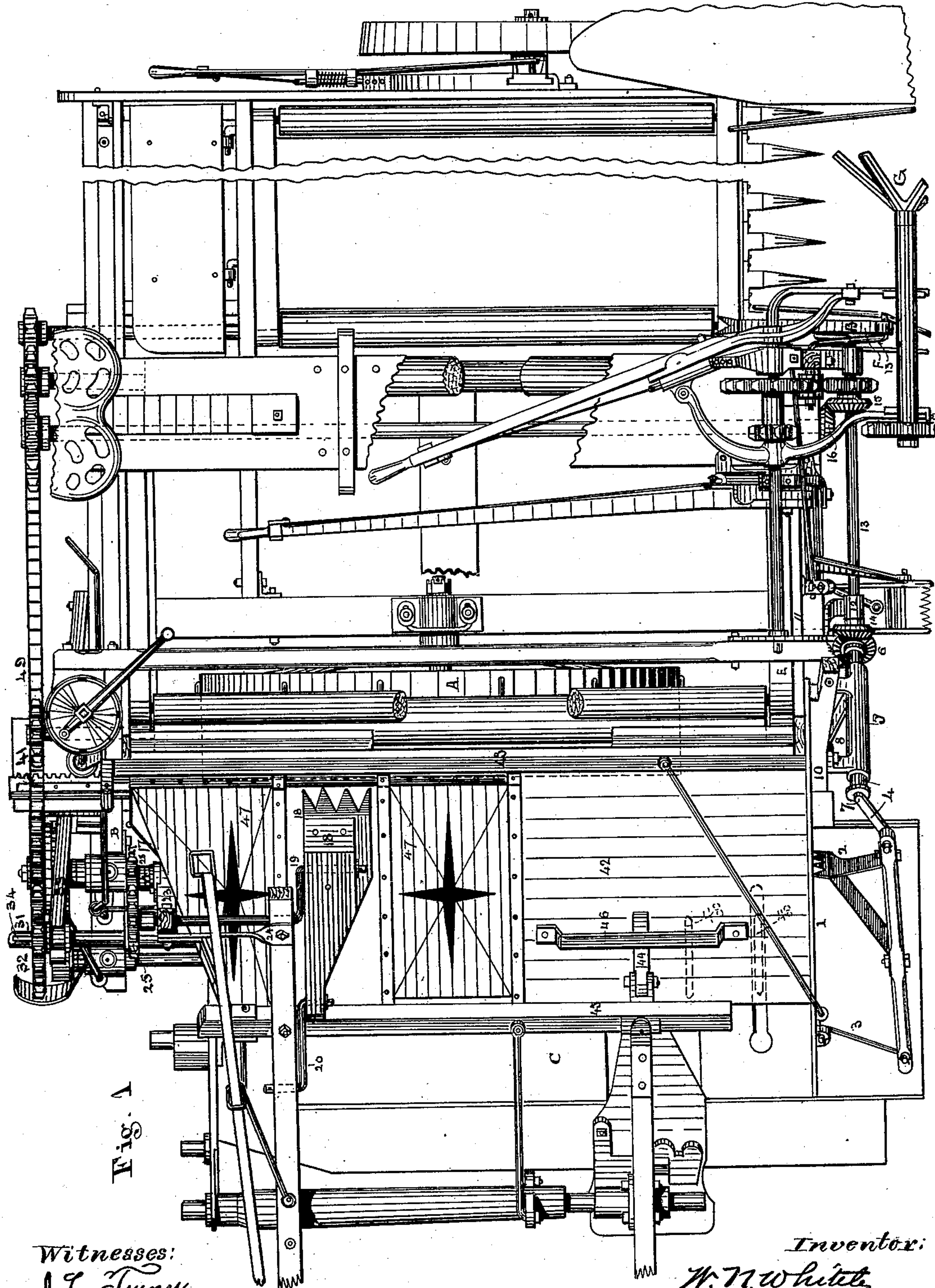


Fig. 1

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J. C. Turner.  
E. C. Ford.

Inventor:  
W. N. Whiteley,  
By his atty,  
R. D. Smith.



(Model.)

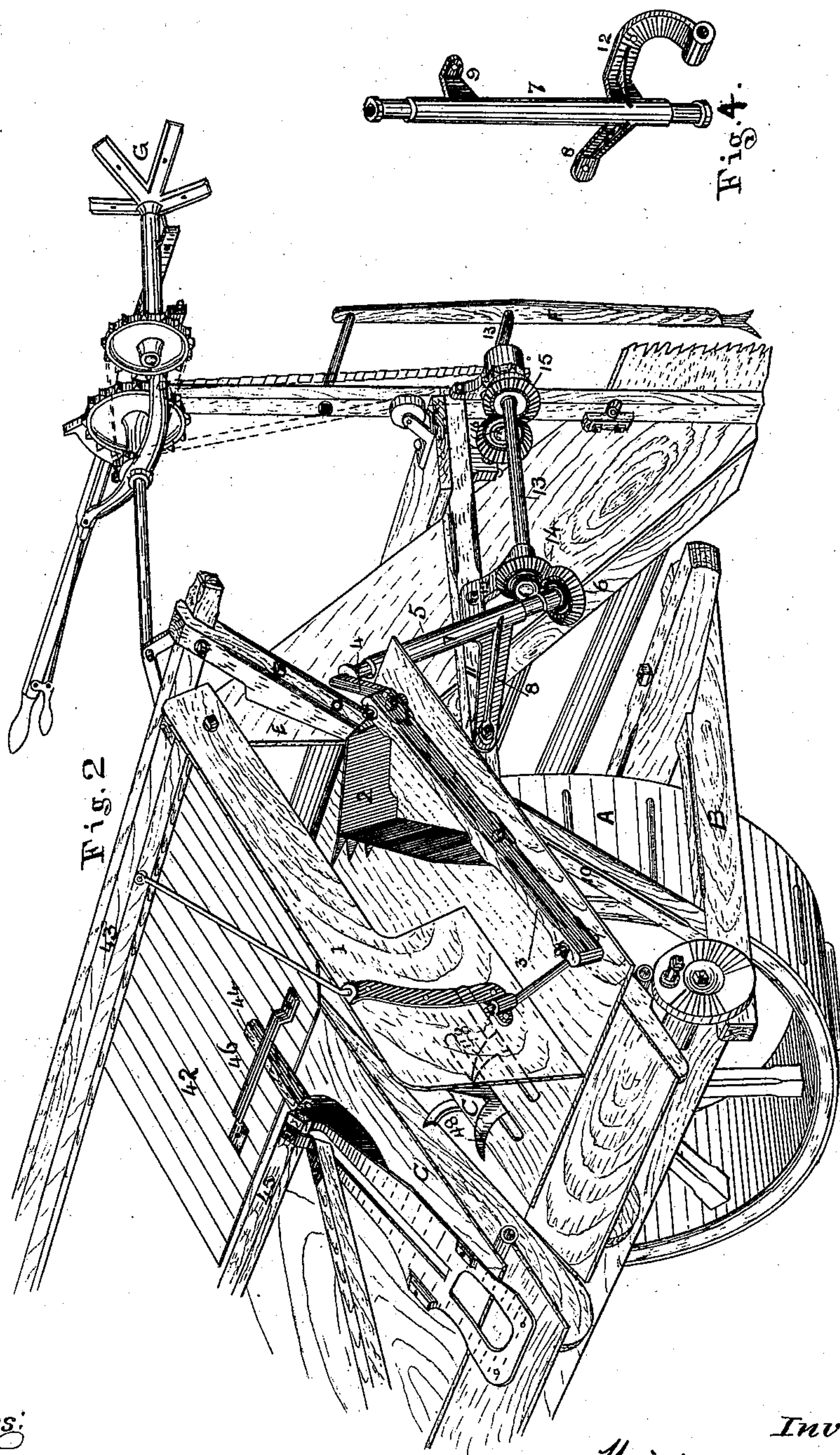
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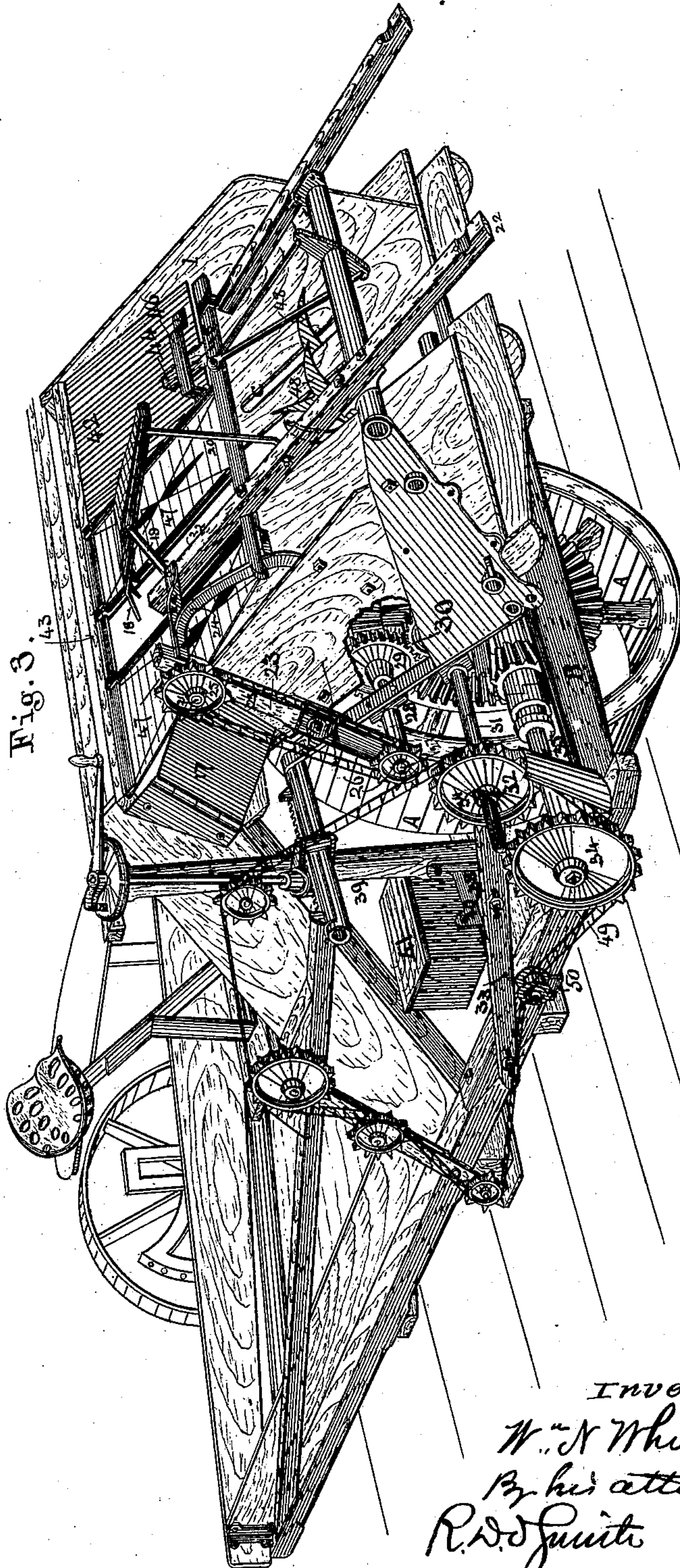
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# UNITED STATES PATENT OFFICE.

WILLIAM N. WHITELEY, OF SPRINGFIELD, OHIO.

## GRAIN-BINDER.

SPECIFICATION forming part of Letters Patent No. 376,123, dated January 10, 1888.

Application filed April 15, 1884. Serial No. 127,993. (Model.) Patented in Canada October 1, 1884, No. 20,327.

*To all whom it may concern:*

Be it known that I, WILLIAM N. WHITELEY, of Springfield, in the county of Clark and State of Ohio, have invented new and useful Improvements in Grain-Binders, (which have been patented in Canada October 1, 1884, No. 20,327;) and I do hereby declare that the following is a full and accurate description of the same.

The general structure and mode of operation of the binding mechanism, so far as relates to the introduction of the grain, placing and securing the band, and discharge of the bound bundle, are well known and will be understood by persons skilled in the art from an inspection of the drawings; and for that reason a particular description of those well-known features will not be required herein. The following detailed description will therefore mainly refer to those parts which are the subject of the claims herein.

Figure 1 is a plan of my machine. Fig. 2 is a perspective view from the front. Fig. 3 is a perspective view from the rear. Fig. 4 is a perspective view of the pipe-box and bracket.

A is the main supporting and driving wheel. B is the main frame of the harvester, and C is the binder attached thereto, including packers, knotting mechanism, &c. At the front of the binder, but attached to and supported by the elevator-frame E, I attach a butt-board, 1, the lower edge being close to but clear from and parallel with the deck of the binder. This butt-board is independent of the binder, for the reason that the binder is movable longitudinally on the harvester, so as to adjust the binding devices to the center of length of the grain; but the butts will always occupy a position close to the front of the elevator, whether the grain be long or short. Therefore the butts of the grain will always drag; and it has heretofore been found advisable to assist them to move forward, and the relief-rake F has been employed for that purpose. I now, in addition, have devised the butt-rake 2, the tail whereof is attached to a radius-rod or vibrating arm 3, which in turn is connected to the butt-board 1. The rake 2 is carried on the arm, and its inner end is operated by the crank 4, so that it has imparted to it a continuous movement in an elliptical path, which on the advance projects inward past the butt-board

and pushes the butts of the grain inward and backward toward the binder, while the retreat is outside of the board and clear of the butts.

The shaft 5, which carries the crank 4 and pinion 6, has its bearings in a long pipe-box, 7, which is provided with lugs 8 and 9, whereby it is bolted to the elevator-frame bars 10 and 11, and thereby it not only strengthens the frame but is itself steadily held in position. It is also provided with the foot-extension 12, which constitutes the box or bearing for the shaft 13, with its pinions 14 and 15, whereby motion is communicated from shaft 16 to the relief-rake F, the reel G, and the butt-rake 2. The shaft 16 is driven by power applied at its rear end, as hereinafter described.

To prevent any dragging back of the heads as they enter upon the binder-deck and pass the inclined head-board 17, whereby the bundle is restrained from motion endwise under the action of the butt-rake, I have placed the hand-like head-rake 18 above the receptacle of the binder, carried and controlled by a crank, 19, and its tail controlled by a radius-rod or pivoted link, 20, and so that it has a movement in a vertical plane similar to the movement of the butt-board, striking into the grain at the heads with an action like that of a human hand to move it outward to the binder, and by the same action upon a succeeding bundle help to force the bound sheaf out of the machine.

The crank 19 is actuated by the shaft 21, having a bearing at one end on the brace-arm 22 and at the other end on the standard 23, which is also strengthened by the braces 24. The sprocket-wheel 25 is mounted on the extremity of the shaft 21, and it is driven by a chain from the sprocket 26, at the lower extremity of the standard 23. The sprocket 26 is placed on the shaft 27, which turns in a pipe-box, 28, firmly bolted to the frame of the binder, and moves back and forth with it when its adjustment is changed. At the inner end of the shaft 27 there is a spur-gear, 29, which meshes with a similar gear, 30, on the packer-shaft 31, the bearing-boxes for which are also secured to the frame of the machine, so that the head-rake 18 is driven from the shaft, which also drives the ordinary packers, and therefore works coincidently with them.



The ordinary packers, 48, are carried and operated by the shaft 31, which is at its rear end provided with a sprocket-wheel, 32, turning in a permanent bearing supported by the brace 33, and is provided with a feather or sliding key, 34, which travels in a longitudinal groove in the shaft 31, so that as the binder is shifted forward or backward, carrying shaft 31 with it, said shaft slides through the hub of the sprocket 32, but does not fail to turn it, whatever position the binder may be in. It is necessary to maintain the wheel 32 in position in the plane of the wheel 34 on the main pinion-shaft 35, whereby motion is transmitted from the main wheel to the conveying and binding devices by means of a single chain, as shown.

In order that the relative positions of shafts 21 and 27 may be regulated to adjust the tension of the driving-chain, the wheel 32 is supported upon the end of the brace 33, which at its opposite end is bolted to the sill of the main frame, and near the shaft-bearing it is supported by a bracket, 38, secured to the post 39 of the elevator-frame. The bracket 38 is also provided with an arm, 40, whereon the twine-box 41 is secured.

The grain is delivered from the elevator upon the deck of the binder and protected from the action of the wind by a sheet-iron cover, 42, which is secured at one edge to the ridge-bar 43 of the elevator-frame, and at the opposite edge is supported by a short arm, 44, projecting from the bar 45 of the binder-frame, projecting under the long strap or bail 46 of the cover 42, so that while said cover is attached to the elevator-frame, and is therefore relatively stationary, the binder may slide forward and backward and still support the cover. It is necessary that the head-rake 18 shall have free passage through a space in the cover adapted to the width of said rake; and it is therefore required that the cover shall be made in separate parts, the part 42 being stationary, as described, and the part 47 being attached to the binder and movable with it. The opening for the passage of the rake is in the part 47, and the front edge of said part slides under the cover 42.

The packers 48, acting from below the platform upward, about the middle of the bundle and the butt-rake and head-rake at or near its extremities above the platform, co-operate to move the grain with certainty and dispatch forward within reach of the binder-arm.

The driving-chain 49, whereby motion is transmitted from the wheel 34 to wheel 32 and the other wheel whereby the elevating and binding devices are actuated, passes over a tightener or idler, 50.

Having described my invention, I claim as new—

1. In a self-binding harvester, the combination, with an adjustable binder, of butt-rake 2 and butt-board 1, located on the elevator-frame and working in line with deck or platform of the binder, but independent thereof, whereby the binder may be moved, as to the

elevator-frame, without moving said butt-rake or butt-board.

2. A traveling butt-rake, 2, connected with the fixed butt-board by a link, 3, and carried on and driven by a crank, 4, located on the elevator-frame independent of the binder-platform, as set forth and described.

3. The pipe-box 7, provided with bracket-legs 8 and 9, and the bracket-leg 12, provided at its extremity with a bearing for the reel-driving shaft, whereby the butter-driving shaft and the reel-driving shaft are always kept in exact positions, as set forth.

4. A butt-rake mounted above the binder deck or platform, in combination with a relief-rake at the foot of the elevator, and shafts 5 and 13, and gearing whereby said rakes are driven by one shaft, 16, substantially as set forth.

5. The shaft 16, in bearings at the front and rear ends of the machine and receiving power at its rear end from the prime mover, combined with the shafts 5 and 13, actuated by said shaft 16, the butt-rake 2, relief-rake F, and reel G, driven by chain from shaft 13, all actuated by power transmitted by said shaft 16.

6. The palmated head-rake 18, located on top and at rear end of binder above the inflowing grain, mounted on and moved by a crank and radius rod, substantially as shown and described.

7. In a grain-binding harvester, the combination of the grain-binding mechanism adjustable longitudinally upon the harvester, and provided with a head-rake mounted upon the binder and movable therewith, and a butt-rake mounted upon the frame of the elevator and independent of the binder, as set forth.

8. In an automatic grain-binder longitudinally adjustable on the harvester, in combination with the grain-packers of said binder working beneath the platform thereof and nearer the butts of the grain than the needle-arm, a palmated reciprocating butt-rake located over and close to the binder-platform, but entirely independent thereof, for the purpose of cleaning the elevator-belts and raking the grain over the binder-table.

9. In an automatic grain-binder, the combination, with a longitudinally-adjustable binder mounted on the harvester, the compressing devices, against which the grain is compressed, and packers working from below upward through the platform of the binder, of a head-rake mounted on said binder above the platform and inflowing grain, said packers and head-rake being movable with the binder, and a butt-rake mounted on the frame of the elevator independent of the binder, substantially as set forth.

10. In a grain-binding harvester, the combination, with an automatic binder mechanism adjustable longitudinally upon the harvester and provided with a head-rake carried on said binder, of a butt-rake carried by the harvester independent of the binder, and a shield or cover in two parts, one part attached



to and moving with the binder, the other part rigidly attached to the harvester and arranged substantially as set forth.

11. The head-rake and its crank-shaft 21, 5 combined with packer crank-shaft 27, the standard 23, and the sprocket-wheels and connecting-chain, whereby the head-rake is actuated by the packer-shaft, as set forth.

12. The braces 33, fastened at one end to 10 the rear sill, and near the other end supported by the rear elevator-post, 39, with slotted holes

for the fastening-bolts, and a seat for the hub of wheel 32, thereby forming an adjustable support for the rear end of the packer-shaft.

13. The bracket 38, with seat-arm bolted on 15 the rear elevator-post, 39, making a combined support for the twine-box 41 and packer-shaft brace 33.

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Witnesses:

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