(No Model.)

4 Sheets—Sheet 1.

G. W. MORRIS.

THRASHING MACHINE.

No. 310,072. Patented Dec. 30, 1884.

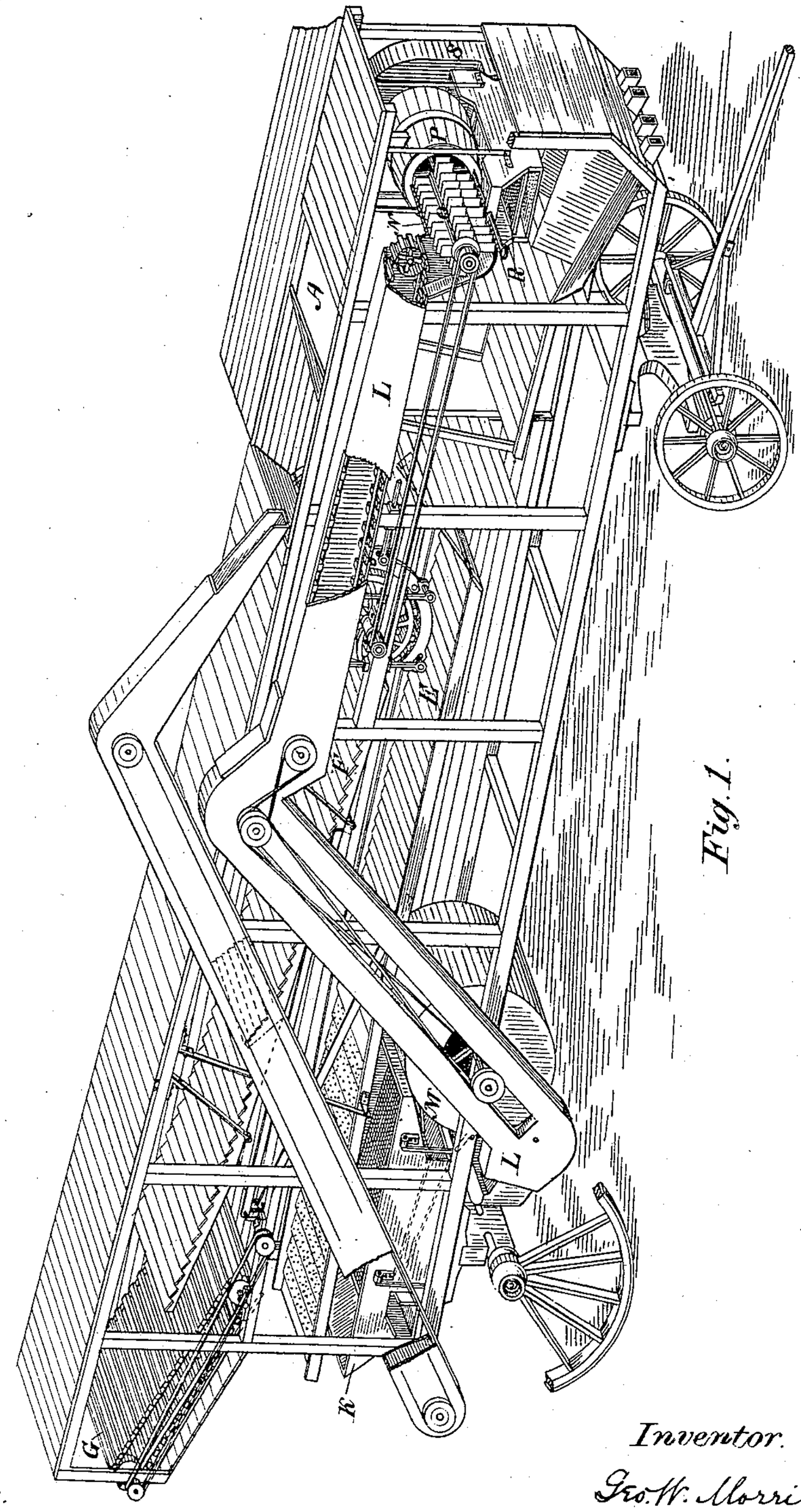

Fig. 1.

Witnesses.

W. D. Graham.

C. C. Baldwin

Inventor.

Geo. W. Morris.

by Donald C. Ridout & Co.

Atty's.

(No Model.)

4 Sheets—Sheet 2.

G. W. MORRIS.

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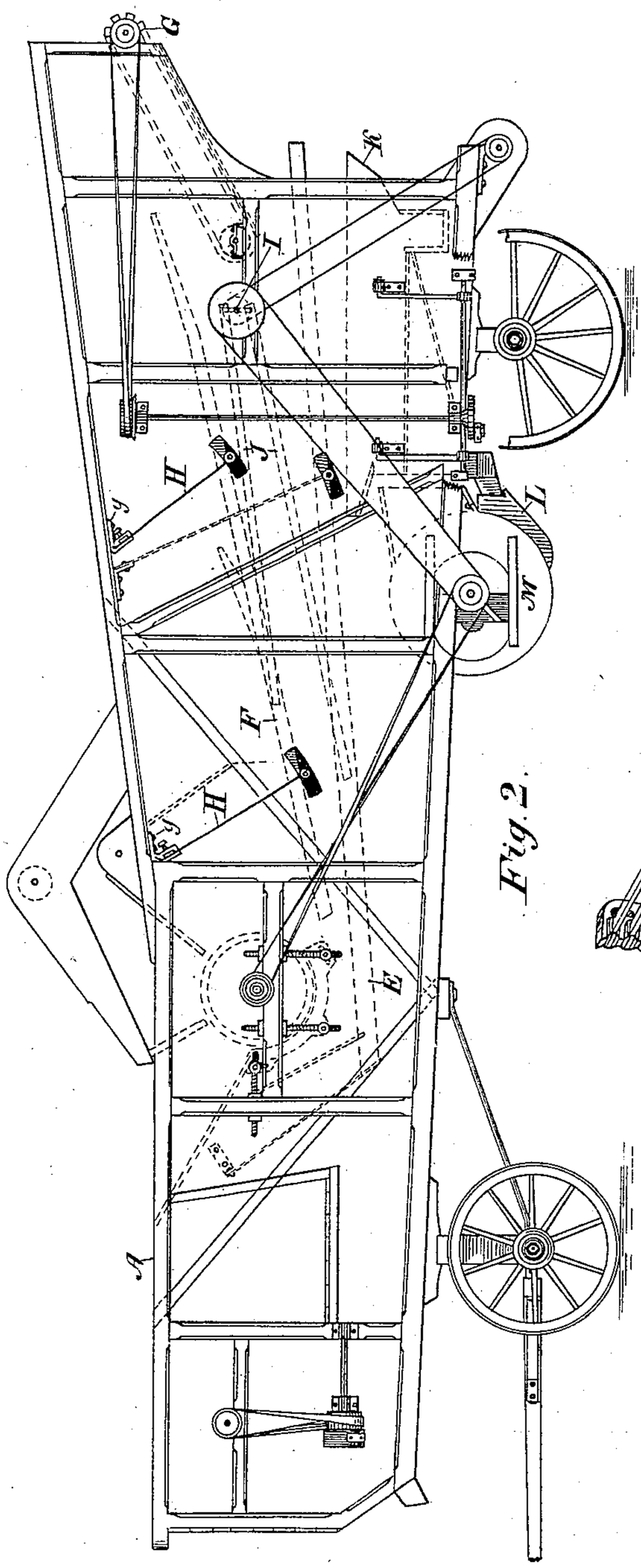

Fig. 2.

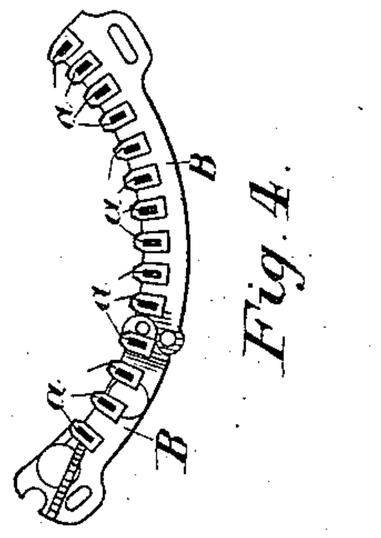

Fig. 4.

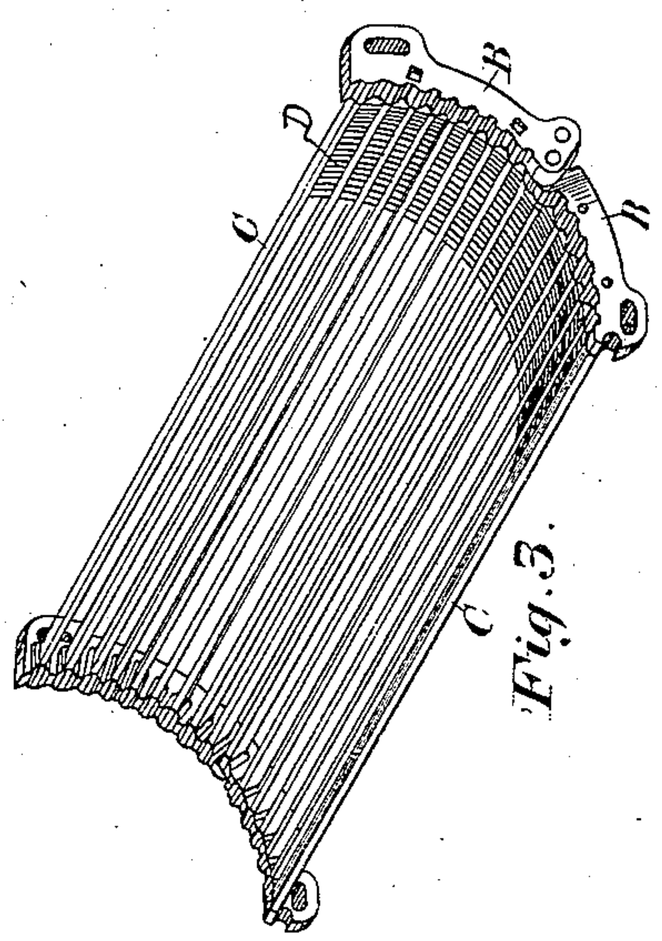

Fig. 3.

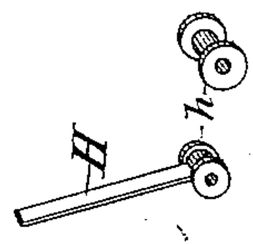

Fig. 6.

Witnesses.

W. Graham.

C. C. Baldwin.

Inventor.

Geo. W. Morris.

by Donald C. Ridout & Co.

Attys.

(No Model.)

4 Sheets—Sheet 3.

G. W. MORRIS.

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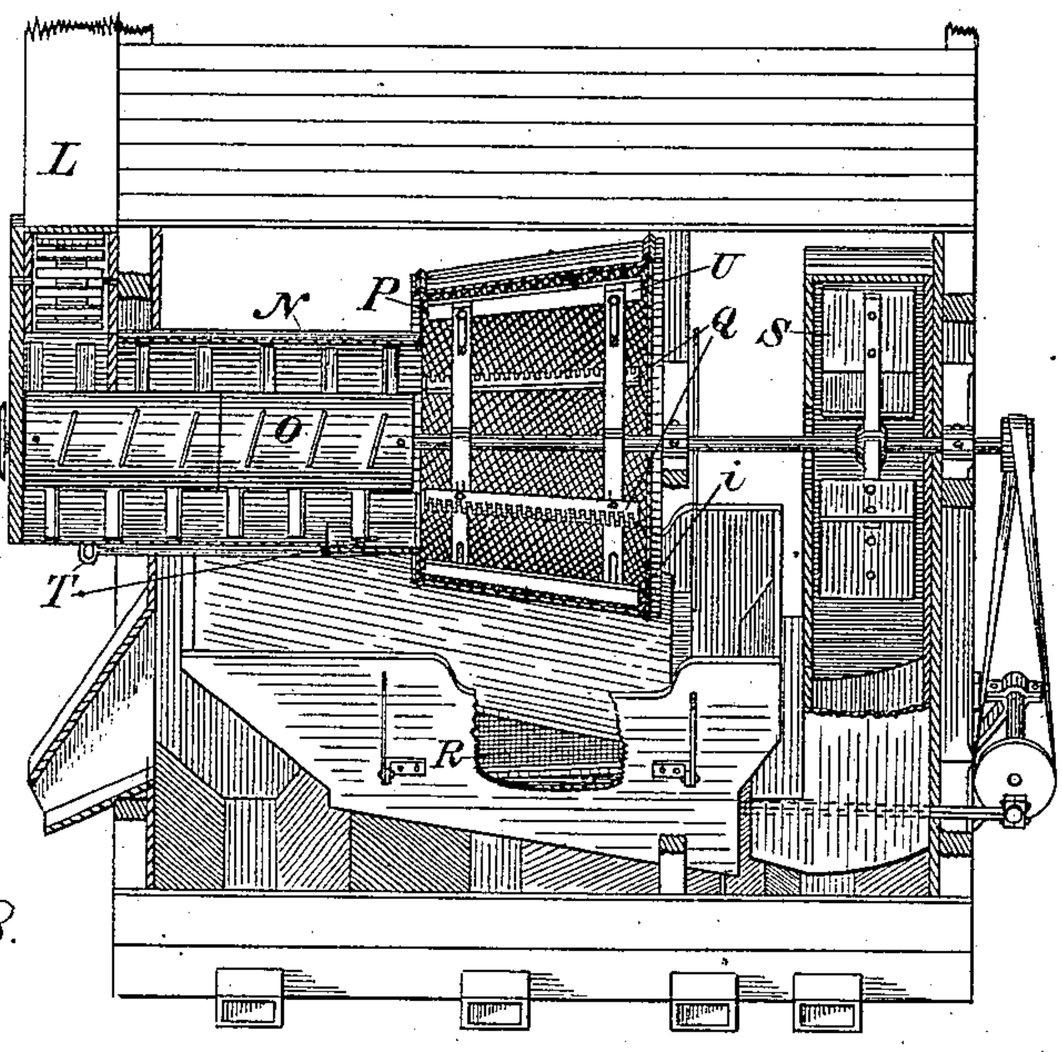

Fig. 8.

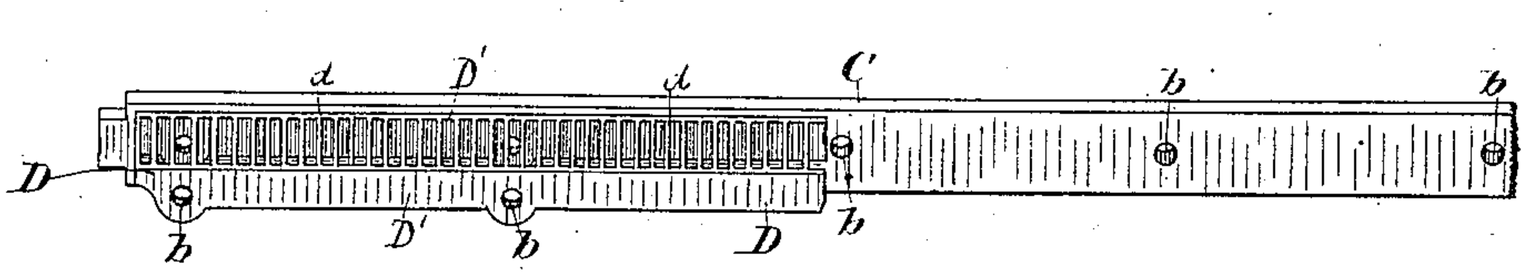

Fig. 5.

Witnesses:

W. D. Graham.

C. C. Baldwin

Inventor.

Geo. W. Morris.

by Donald F. Ridout & Co.

Attys.

(No Model.) 4 Sheets—Sheet 4.

G. W. MORRIS.

THRASHING MACHINE.

No. 310,072. Patented Dec. 30, 1884.

Fig. 9.

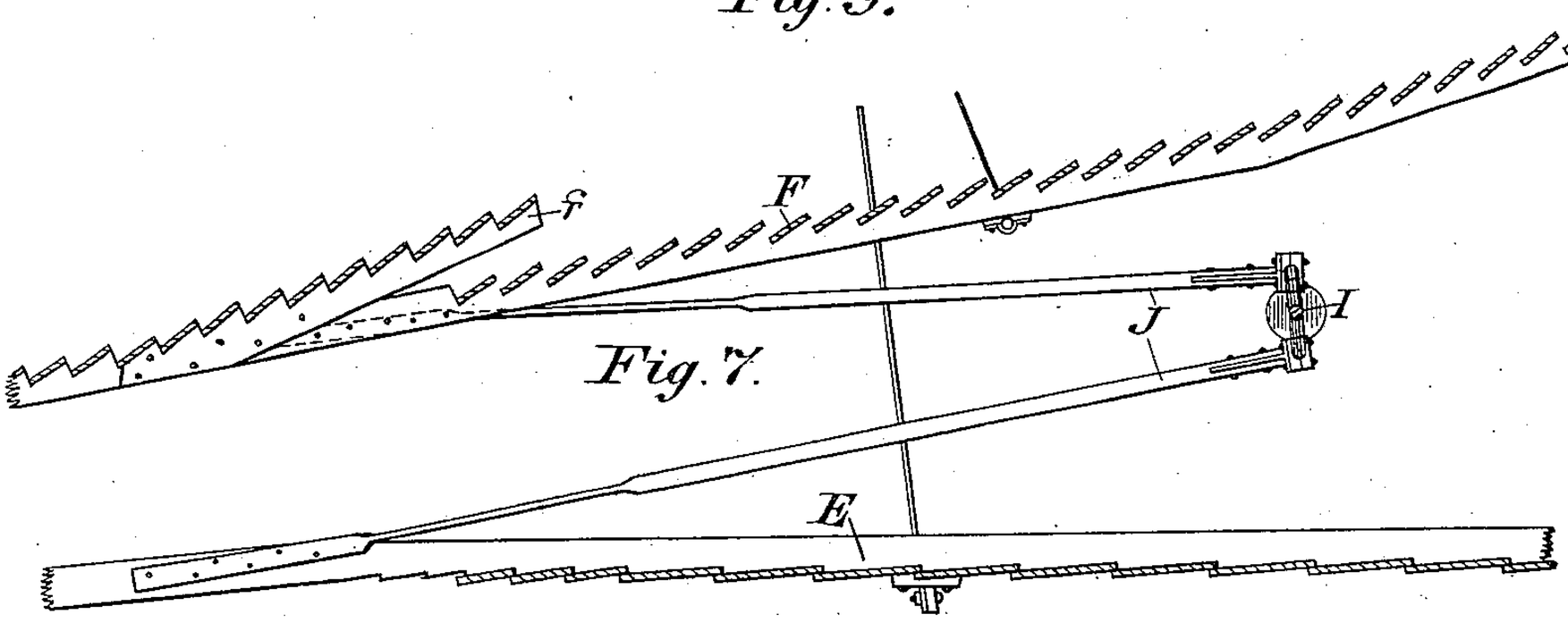

Fig. 7.

Witnesses.

W. D. Graham.

C. C. Baldwin

Inventor.

Geo. W. Morris.

by Donald C. Ridout & Co.

Attys.

UNITED STATES PATENT OFFICE.

GEORGE W. MORRIS, OF BRANTFORD, ONTARIO, CANADA.

THRASHING-MACHINE.

SPECIFICATION forming part of Letters Patent No. 310,072, dated December 30, 1884.

Application filed March 13, 1884. (No model.)

To all whom it may concern:

Be it known that I, GEORGE WILLIAM MORRIS, of the city of Brantford, in the county of Brant, in the Province of Ontario, Canada, machinist, have invented certain new and useful Improvements in Thrashing-Machines; and I do hereby declare that the following is a full, clear, and exact description of the same.

The object of the invention is to devise a simply and cheaply constructed double-blast thrashing-machine, in which the grain is most thoroughly separated from the straw without any fear of the kernels being cracked or broken, and in which the dust, chaff, and foul seed are most perfectly removed, and the grain is beautifully brightened, ready for the market, before being finally discharged from the machine; and it consists in the peculiar combinations and the construction and arrangement of parts, more fully hereinafter described, and then pointed out in the claims.

Figure 1 is a perspective view of my improved thrashing-machine with a portion of the sheeting removed to expose its interior construction. Fig. 2 is a side elevation of my improved machine, looking at it from the opposite side to that exposed in Fig. 1. Fig. 3 is a perspective detail of my improved concave. Fig. 4 is an end detail of the concave. Fig. 5 is a perspective view, showing the form of my improved grate fixed to one of the longitudinal bars of the concave. Fig. 6 is a perspective detail showing the construction of my spring-hanger. Fig. 7 is a skeleton elevation showing the straw-shaker and grain-carrier, with the mechanism by which they derive the longitudinal shake. Fig. 8 is a sectional end view of my combined smutter and fanning-mill. Fig. 9 is a detail of crank-shaft for driving straw-shaker and grain-carrier.

In the drawings like letters of reference indicate corresponding parts in each figure.

The simplest plan by which the special construction of the parts involved can be explained is to commence at the point where the straw is conveyed into the machine and to follow the grain in its passage through the machine.

On reference to Figs. 1 and 2 it will be seen that the operator stands on a foot-board in front of the cylinder, a space, A, being left in the machine to allow his body to project above the top of the machine in the usual manner.

The grain, when fed into the mouth of the machine, is thrashed in the ordinary manner; but instead of using the toothed cylinder, acting in conjunction with a toothed concave, an ordinary drum-cylinder provided with grooved steel beaters of the usual description may be employed.

I claim nothing peculiar in the construction of the drum-cylinder; but in the formation of the concave used in conjunction with it a considerable improvement is effected.

On reference to Figs. 3, 4, and 5 the peculiarity of my construction will be understood. Each end of the concave is formed of two curved castings, B, hinged together as indicated in Figs. 3 and 4. These curved castings have sockets *a* formed in them, into which the ends of the bars C are fitted. These bars are preferably formed of steel, and have tenon ends, as indicated in Fig. 5, designed to fit into the socket *a*. By thus having tenon ends the bars C can not only readily be fitted into the ends B to form the concave, but it enables them to be readily reversed when their edges become worn. As there are four edges for each bar, and only one edge at a time being acted against, this plan, by which the bars can readily be changed, renders the life of the concave much greater than were the bars fixed rigidly in position.

Between each pair of bars C, I insert a grate, D, which consists of the side bars, D′, and the bridges *d*, which, extending at right angles thereto, form part of the said bars C, or, in other words, these grates D fill the opening between the bars C, which would, if the grates were not inserted, have long openings running parallel with them. This construction is clearly shown in Figs. 3 and 5.

It will be noticed that the bolt-holes *b*, for the passage of the binding-bolts, are made through the bars C, the said holes being in the center of the bars and at such a distance apart longitudinally as may be necessary to properly bind the bars C against the grate-bars D′, the holes through the grate-bars being at equal distances apart, corresponding with the holes

in the bars C, so that the said bars may be reversed without altering the relative position of the two sets of holes through the bars and grates, respectively.

Suitable bolts, with heads and nuts countersunk into the ends B, are employed for binding the concave together longitudinally.

I do not claim anything special in the hinging of the two castings forming the ends of the concave. It is therefore sufficient to state that the grain thrashed out of the straw in the cylinder falls through the grate D onto the jog-tray or grain-carrier E, and, owing to the special construction of the concave herein described, the grain so thrashed out is less liable to be cracked or broken than in any other form of concave I know of.

Before following the course of the grain thus dropped onto the grain-carrier E, I shall first follow the course of the balance of the grain, which, with the straw, is thrown by the action of the cylinder onto the straw-shaker F. This straw-shaker is composed of a series of cross-slats, *d*, supported in a longitudinal frame. These cross-slats are arranged in what may be termed a "clap-board" form, which is clearly indicated both in Fig. 1 and in Fig. 7, in which latter figure it will be noticed that there is a small space between each of these slats, which space permits the grain to fall through the straw-shaker F onto the grain-carrier E during the passage of the straw from the cylinder to the revolving tail-rake G.

In order to insure the separation of the grain from the straw before it reaches the end of the shaker F an inclined bridge, *f*, is placed across the upper surface thereof, which bridge raises the straw a short distance above the main surface of the shaker F and drops it onto the said surface, which drop shakes up the straw and effectually frees the grain held by it; but in order to still further provide for the thorough separation of the grain from the straw the end of the straw-shaker F is raised some little distance above the revolving tail-rake G, which distance produces a sufficient fall to thoroughly separate any odd kernels of grain which may have been held in the straw. Both the grain-carrier E and the straw-shaker F are suspended from the main frame of the machine by spring-hangers H.

A detail showing the shape of the hangers H is exhibited in Fig. 6, in which it will be seen that it is composed of a spring-bar fitted into a slot, g', within the bracket *g*, and secured therein by a set-screw, g^2, and clamp-block g^3, so that it may be readily withdrawn or adjusted. The other end of the hanger H is bent around a spool, *h*, having a hole through it, through which a pivot-pin is inserted to connect the hanger to the carrier or shaker, the bracket *g* being fastened to the main frame of the machine, as indicated in Figs. 1 and 2. On reference to these figures it will also be noticed that the hangers H are set at an angle, the object of which is to insure a vertical movement of the shaker and carrier simultaneously with their longitudinal reciprocating movement. This movement is derived from a crank-shaft, I, (shown in detail in Fig. 9,) in which figure it will be noticed that there are two cranks at each end of the shaft, the double crank at each end being provided for driving the shaker and carrier on both sides, the cranks being connected to the carrier E and shaker F by the rods J, and so set that while the shaker and carrier operate simultaneously the movement of one will be in a forward direction, while the movement of the other is backward; consequently, while they both derive a reciprocating longitudinal movement from the motion of the crank-shaft I, they never move simultaneously in the same direction. The connection between the crank-shaft and shaker and carrier is exhibited in detail in Fig. 7. The upward longitudinal reciprocating motion of the grain-carrier E and the straw-shaker F causes the straw on the shaker F to move toward the end of the shaker F, where it falls onto the revolving tail-rake G, the grain, during the passage of the straw thus moved, being completely shaken out of the straw, and falling through the open shaker F onto the grain-carrier E, which grain-carrier is formed of a series of cross-slats arranged in what may be termed "clap-board" form, similar to the shaker F, only that the boards thus arranged are close together in the carrier E, as shown in Fig. 7, so as to form a close bottom; consequently the grain, as it cannot fall through the carrier E, will, by the vertical longitudinal reciprocating movement of the carrier E, be caused to travel toward the back end of the said carrier; but before it reaches the end it has to pass over the perforated portion of the carrier E, which perforations are made through the clap-boards forming the bottom of the carrier at the point immediately over the dressing-shoe K. These perforations will be seen on reference to Fig. 1, and are of such a size as to permit the grain to fall through the bottom of the carrier E into the dressing-shoe K, while the straw and rubbish continue to move toward the end of the carrier E and fall over its end.

The dressing-shoe K is of the ordinary construction, and derives a vibrating lateral shake from the main driving mechanism of the machine. After the dressing-shoe K has performed its duty the grain is discharged from it into the bottom end of the elevator L, which is designed, as shown in Fig. 1, to convey the grain into the combined smutter and fanning-mill, located in the front of the machine. The fan M sends a blast through the bottom of the dressing-shoe, blowing the light stuff which may have fallen through with the grain out of the end of the machine. I do not claim anything peculiar in this fan or in the dressing-shoe; but my object is to devise a simple means for still further cleaning the grain, in order to make it ready for market before it is finally discharged from the machine.

Nothing peculiar is claimed in the con-

struction of the elevator L, it being made in the ordinary manner, the only peculiarity being that it is caused to convey the grain, as indicated, from the dressing-shoe K to the chamber N, located in the front of the machine. This chamber is cylindrical in shape, and has a worm-conveyer, O, as shown in Figs. 1 and 8, designed to carry the grain through the chamber into a smutter-barrel, P, provided with beaters Q, the teeth in the beaters being set in a spiral form, so that when revolving they form what might be termed a "worm-conveyer," to carry the grain through the barrel P to the discharge-port *i* in the said barrel. The said beaters, while so operating, effectually crush the smut into powder, which, when discharged with the grain onto the finishing-sieve R, is blown away by the action of the fan S, located at the end of the smutter, as indicated. It will thus be seen that should the grain being thrashed require additional cleaning after passing through the dressing-shoe K it will be very effectually purified by the time it has passed through the smutter-barrel P, and is screened by the finishing-sieve R, which derives a reciprocating shaking movement from the main driving mechanism of the machine.

When the grain has been discharged by the elevator into the chamber N, the operator is enabled to examine its condition by opening the slide T, made in the bottom of the chamber N. Should he find that the grain did not require to be passed through the smutter he can, by opening the slide T, discharge the grain onto the finishing-sieve R without passing it through the smutter.

I make no claim in this application to the smutter-barrel and fan, as the same may form the subject-matter of a separate application.

What I claim as my invention is—

1. In a thrashing-machine, the combination, with a drum-cylinder, of a concave formed of bars C, with a grate, D, inserted between each pair of bars, said grate consisting of the side bars, D′, and transverse bridges *d*, formed in one piece, substantially as and for the purpose described.

2. In a concave of a thrashing-machine, the bars C, having tenoned ends, and holes *b* at equal distances apart in their centers, and castings B, provided with sockets *a*, for the purpose described, in combination with a grate, D, inserted between each pair of bars C, and bolts passing through the holes *b* in the bars C, and corresponding holes in the side bars, D′, of the grate, substantially as shown and described.

3. The frame A and shakers E and F, in combination with the spools *h*, spring-hangers H, having their lower ends bent around the said spools, slotted brackets *g*, set-screws g^2, and clamp-blocks g^3, for removably securing the upper or free ends of the spring-hangers to the main frame, as and for the purpose herein set forth.

4. In combination with the chamber N, worm-conveyer O, smutter-barrel P, in axial line therewith, and finishing-sieve R, located beneath the said chamber and smutter, the slide T, located at the lowest point of the chamber N, and between it and the smutter-barrel P, for cutting off the supply from the said smutter and discharging the same onto the finishing-sieve, substantially as herein shown and described.

Signed, at the city of Brantford, this 20th day of February, 1884.

GEORGE W. MORRIS.

In presence of—

COLIN MCINTOSH,

EDMAN BROUR.