No. 780,081. PATENTED JAN. 17, 1905.

W. N. WHITELY.

GRAIN HARVESTER BINDER.

APPLICATION FILED JUNE 8, 1903.

3 SHEETS—SHEET 1.

Fig. 1

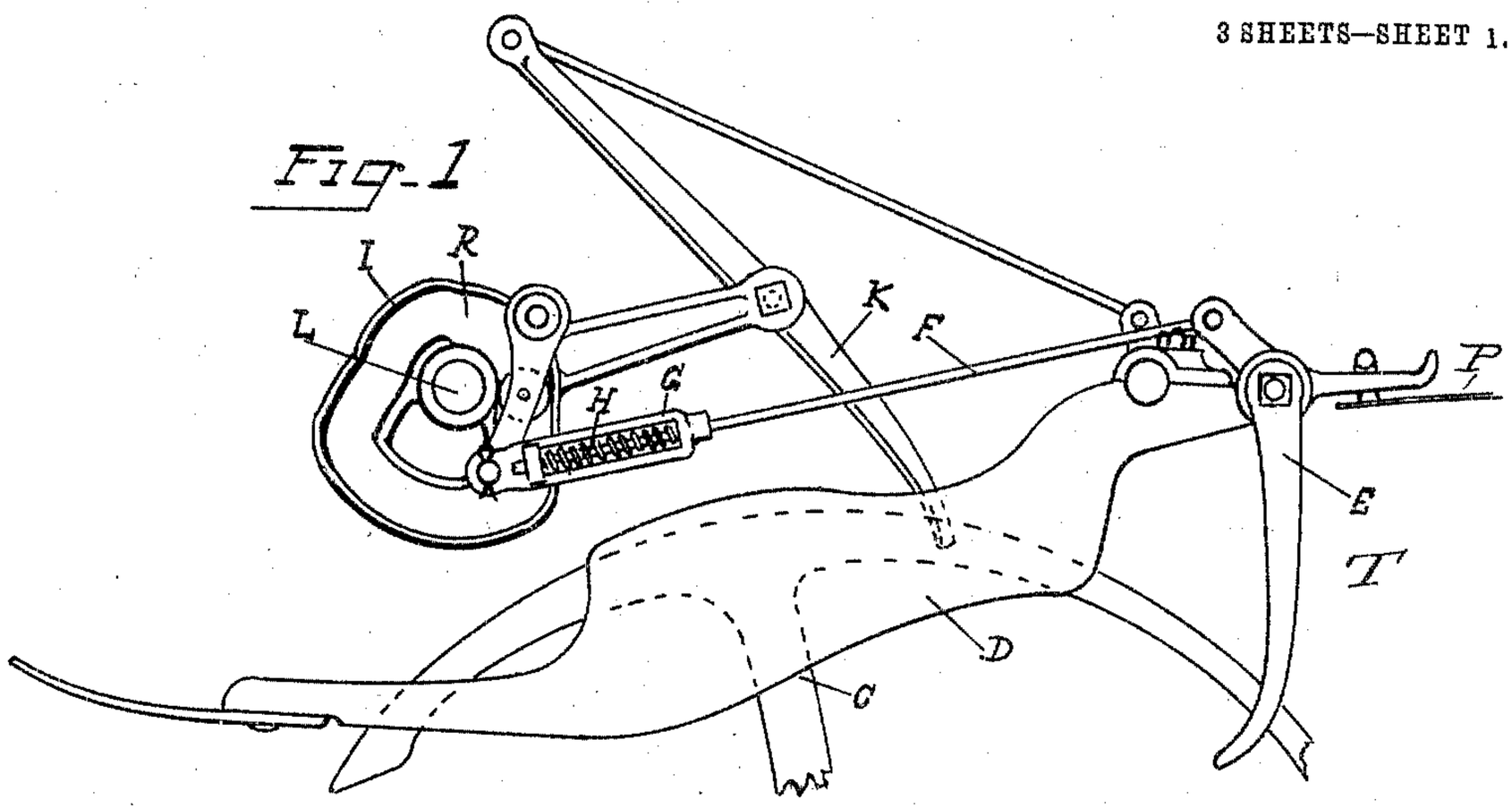


Fig. 2

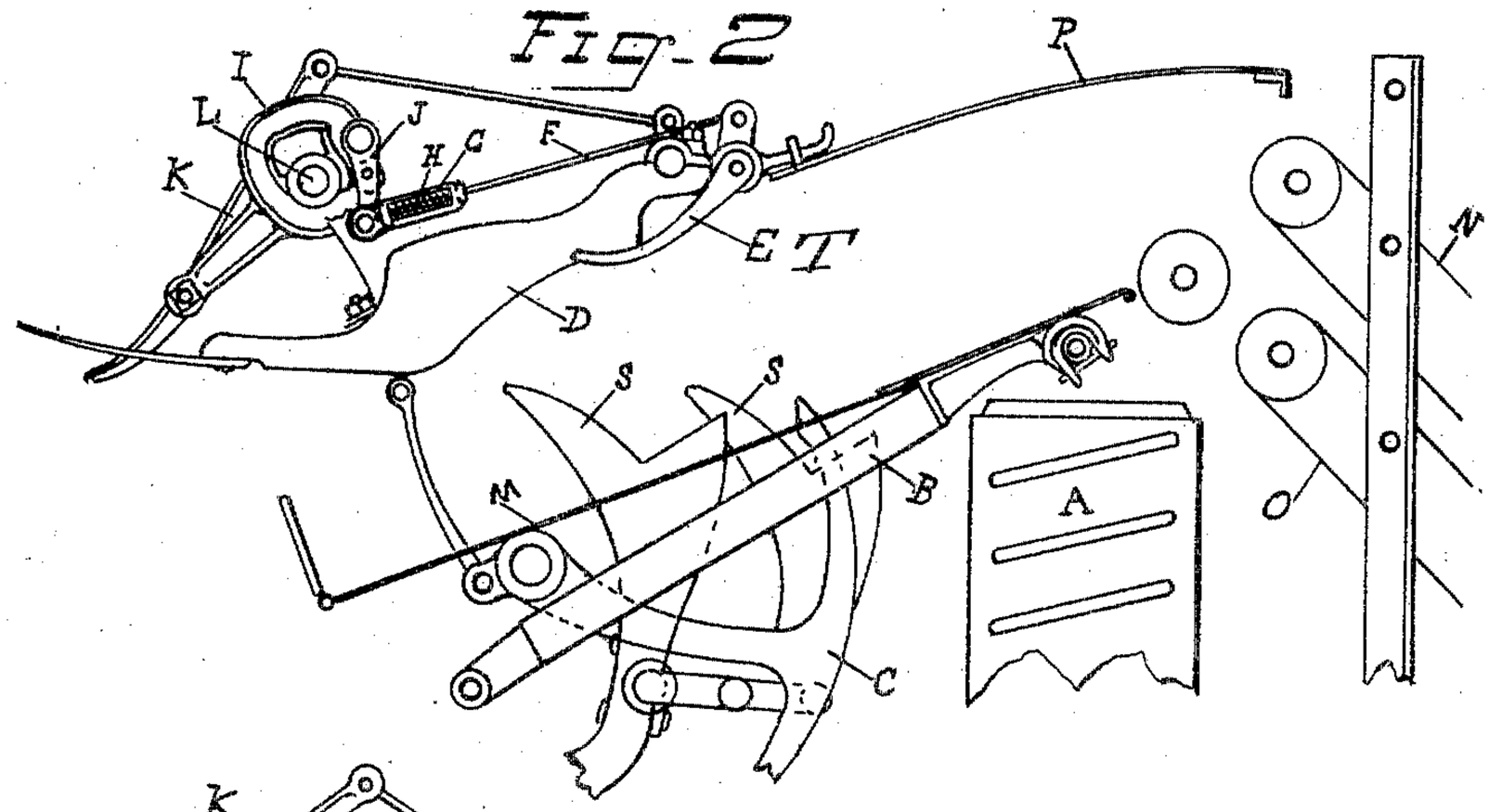
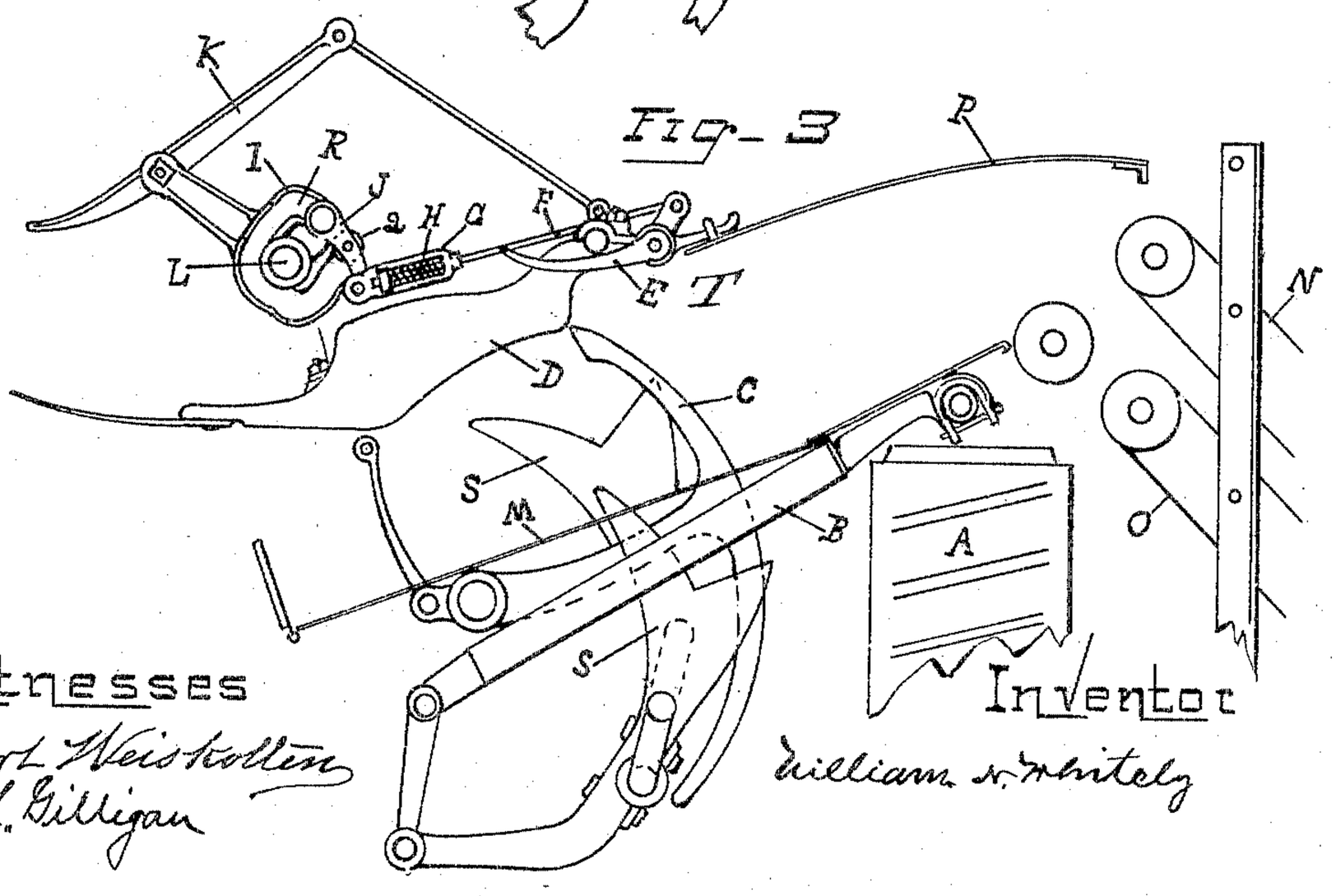


Fig. 3



Witnesses

Robert Weistoffen

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3 SHEETS—SHEET 2.

Fig. 4

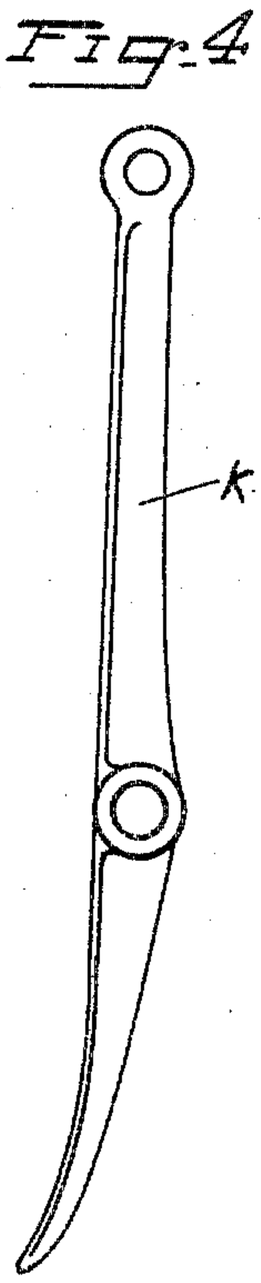


Fig. 5

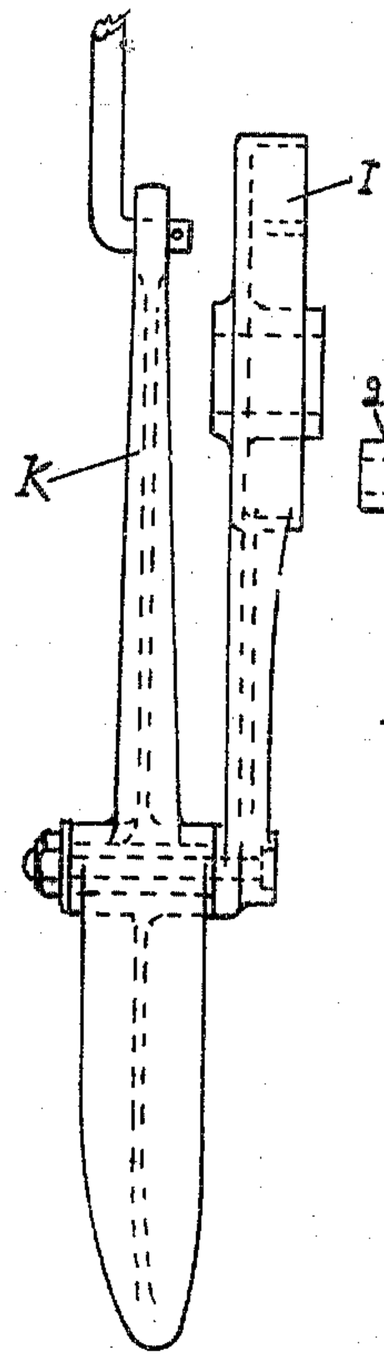


Fig. 6

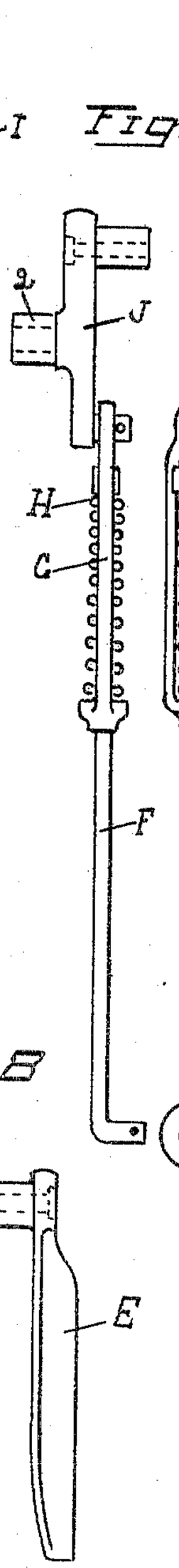


Fig. 7

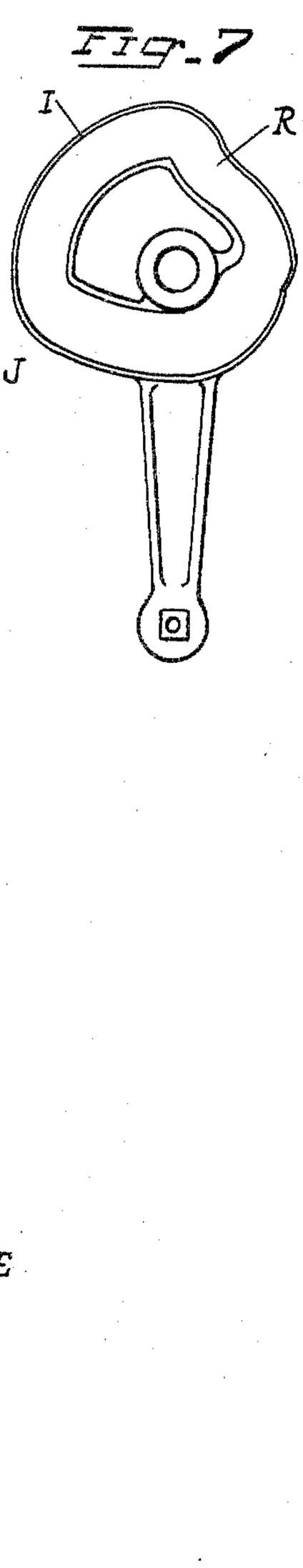
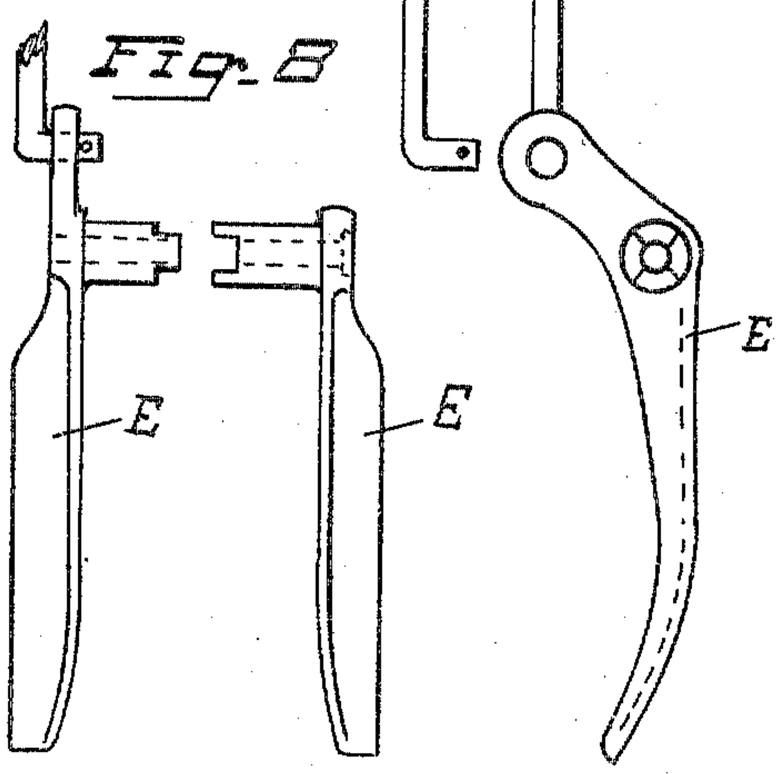


Fig. 8



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3 SHEETS—SHEET 3.

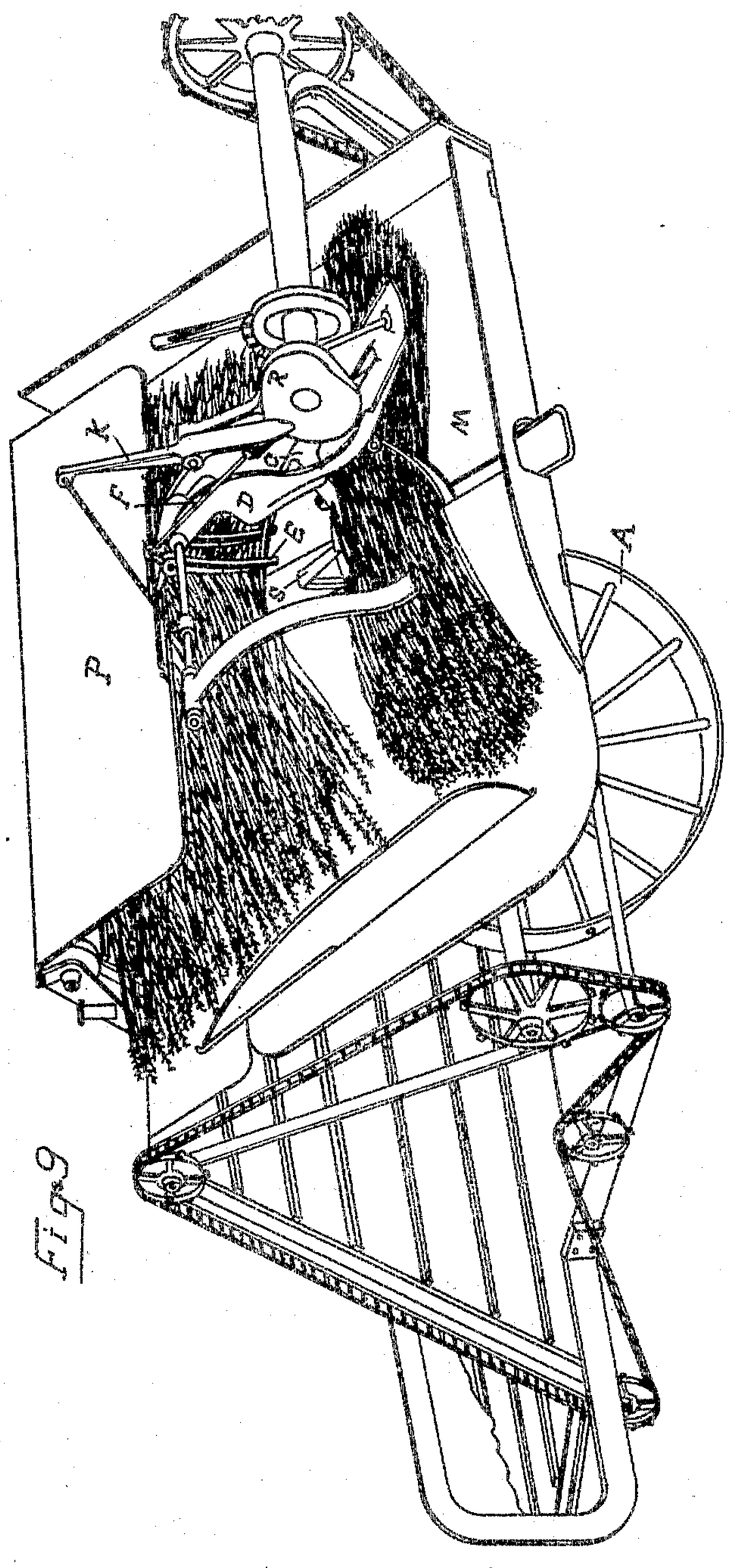

Fig 9

WITNESSES:

Robert Weiekolden

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No. 780,081. Patented January 17, 1905.

UNITED STATES PATENT OFFICE.

WILLIAM N. WHITELY, OF SPRINGFIELD, OHIO.

GRAIN-HARVESTER BINDER.

SPECIFICATION forming part of Letters Patent No. 780,081, dated January 17, 1905.

Application filed June 8, 1903. Serial No. 160,641.

To all whom it may concern:

Be it known that I, WILLIAM N. WHITELY, a citizen of the United States, residing at No. 153 East High street, Springfield, in the county of Clark and State of Ohio, have invented certain new and useful Improvements in Grain-Harvester Binders; and I do declare the following to be a full, clear, and exact description of the invention, such as will enable others skilled in the art to which it appertains to make and use the same, reference being had to the accompanying drawings, and to the letters of reference marked thereon, which form a part of this specification.

My invention relates to improvements in grain-harvester binders of the elevator type—that is, machines employing two elevator-belts and in which the needle rises through the binder-deck and through the grain thereon and passes through a breastplate to convey and present the cord to the knot-tying mechanism. (Not shown.) The binding mechanism is attached to the harvester (as partly shown) in the usual manner.

The object of my invention is to construct a breastplate with an angle to the path of the cord-needle above the flow of the grain binderward, so that the surplus grain not encircled by the cord-needle in its binderward movement may move upward and grainward and not be compacted at the cord-needle's entrance to the breastplate, and also to provide a mechanically-operated grain-gate supported by the breastplate near the cord-needle's entrance to said breastplate to guide the grain downward until the approach of the cord-needle, also to move the grain away from the path of the ejector when discharging the gavel, and also means to allow said grain-gate to yield when encountering heavy masses of grain without breaking said gate or stopping the operation of the machine. I attain these objects by the mechanism illustrated in the accompanying drawings, which are made a part of this specification, in which—

Figure 1 is a rear view of a portion of a grain-harvester binder embodying my invention, showing the breastplate, grain-gate, cam-wheel, and connecting parts between said wheel and grain-gate and the position of the grain-gate when the cord-needle has about reached its farthest binderward movement. Fig. 2 is a rear view of a portion of a grain-harvester binder embodying my invention, showing the breastplate, cam-wheel, and grain-gate supported by said breastplate and connecting parts between said wheel and grain-gate, also a portion of the main driving-wheel and elevators, binder-deck, binder-frame, and the position of the grain-gate when the cord-needle is at rest. Fig. 3 is a rear elevation of the parts shown in Fig. 2, showing the position of the grain-gate when the cord-needle is entering the breastplate, the grain-gate being now at its farthest point binderward, so as to make room for the accumulating grain to pass into the grain-space at the grainward end of the breastplate and back of the cord-needle and not compact against and be drawn into the breastplate by the cord-needle. Fig. 4 is a detail side elevation of the ejector-arm. Fig. 5 is a detail front view of the ejector-arm and cam-wheel. Fig. 6 is a detail front and side view of the crank operated by the cam-wheel and the connecting-rod and spring from said crank to the grain-gate. Fig. 7 is a detail side view of the cam-wheel. Fig. 8 is a detail plan view of the parts forming the grain-gate, showing the manner of connecting together and locking said parts.

Similar letters refer to similar parts throughout the several views.

A indicates the main driving-wheel of the harvester; B, the binder-frame; C, the cord-needle; D, the breastplate; E, the grain-gate; F, the connecting-link from the grain-gate to the cam-wheel; G, the adjustable head on said link; H, the spring mounted on said link; I, the cam-wheel; J, the crank connected to and operated by said cam-wheel; K, the ejector; L, the knotter-shaft; M, the binder-deck on which the grain is deposited by the elevator-belts; N, the upper elevator-belt; O, the lower elevator-belt; P, the binder-deck cover; Q, the roller on the cam-wheel crank; R, the cam-track on the cam-wheel I; S S, the packers; T, the grain-receptacle grainward of the grain-gate E.

Mounted on the shaft L for the knotter is

the cam-wheel I, which rotates with said shaft, and as said cam-wheel I rotates by means of the cam-track R on said wheel constantly contacting with the roller Q on the crank J, to which the adjustable head G is pivotally connected, motion is communicated to the grain-gate mechanism.

Adjustably connected to the link F is the adjustable screw-threaded head G, by means of which the throw of the grain-gate E is regulated. The other end of said link F is pivotally connected to the grain-gate E, and as the cam-wheel I rotates the cam-track R, contacting with the crank J, operates, through the medium of the link F, the grain-gate E, which is supported by the breastplate D.

While I prefer to construct my improved grain-gate bifurcated, as shown in detail in Fig. 8, with means to connect and lock the two parts together, it may be made bifurcated in one piece only, or it may be made with one finger only, the two parts of said grain-gate E being joined together, as shown in Fig. 8. I do this so that the parts may operate closely to the sides of the breastplate D in order to get as close to the cord-needle as possible. I find the bifurcated grain-gate preferable and more effective on the grain than if made with only one finger, as it moves the grain evenly and uniformly from both sides of the cord-needle simultaneously and has no tendency to move one end of the grain faster than the other, which would be objectionable, as the grain would then have a tendency to assume an oblique position on the binder-deck.

During the time the cord-needle C is at rest and while the loose grain is being delivered onto the binder-deck M from the elevators N and O, the grain-gate E is held up in the position as shown in Fig. 2, so as not to hinder the free passage of the grain down the binder-deck M and to close the grain-space in the breastplate D, and when sufficient grain has accumulated on the binder-deck M to form a gavel the cord-needle C starts binderward, penetrating and passing through the accumulated grain on the binder-deck M, and the grain-gate E then assumes the position as shown in Fig. 3, opening the grain-space in the breastplate D, so as to allow the accumulating grain back of the cord-needle C to move freely upward into the grain-space formed on the grainward end of the breastplate D, and when the cord-needle C has about reached its farthest movement binderward the grain-gate E then assumes the position shown in Fig. 1 to sweep grainward the accumulated grain lying back of the cord-needle C away from the breastplate D and the ejector K and not to interfere with or retard the free return movement of the cord-needle C, and when the cord-needle C has about reached its farthest grainward movement the grain-gate E then assumes the position as shown in Fig. 2, closing the grain-space at the grainward end of the breastplate D, so as to allow a free and uninterrupted flow of the grain down the binder-deck M, and remains in that position until sufficient grain has accumulated on the binder-deck M to form a gavel, and when the cord-needle C starts binderward the grain-gate E moves upward in advance of said cord-needle C, opening the grain-space in the breastplate D, and remains in that position until the cord-needle C has about reached its farthest binderward movement and starts to return, when the grain-gate E then moves grainward with the cord-needle C, clearing the accumulated grain off the back of the cord-needle C away from the reach of the ejector K in its movement to eject the bound gavel and to offer no resistance to the free return of the cord-needle C.

In grain-harvester binders as heretofore constructed much trouble and annoyance is occasioned by the accumulating grain crowding onto and compacting against the back of the cord-needle C in its binderward movement, and by the action of the packers S S constantly working the grain binderward wet or tangled grain is sometimes carried by the cord-needle into the slot of the breastplate, particularly grain back of the cord-needle, and sometimes to such an extent as to clog its movements and wedge the cord-needle tightly into the breastplate, stopping its movements in either direction and stopping the machine, and as the cord-needle returns, the grain being compacted by the packers against the back of the cord-needle, it is with much difficulty and at times impossible for the cord-needle to force its way against the accumulated grain in its return movement, and in the event the cord-needle could be forced through the mass of accumulated compacted grain on the binder-deck it is at great expense of power and much strain upon the machine. My invention is intended to overcome these difficulties. By means of my improved breastplate space is provided at its grainward end to allow a certain portion of the accumulating grain to move upward and not be crowded against the back of the cord-needle, and by means of my grain-gate the grain is moved from the back of the cord-needle and breastplate and a good separation of the grain is made, and as the grain-gate holds the accumulating grain back of the path of the ejector it is not ejected with the bound gavel, as otherwise frequently occurs. This is a very important feature, as in grain-harvester binders as now constructed, having no means other than the cord-needle to separate the unbound from the bound grain on the binder-deck, much grain is wasted and lost by being thrown out loosely with the bound gavel. It will be observed by reference to Fig. 1 that the ejector does not reach the accumulating grain on the binder-deck, as it is held away from it by the grain-gate, so as to avoid any

possibility of the ejector catching any grain not encircled by the cord-needle.

My improvement is believed to be new and novel and has proved valuable in grain-harvester binders, as it overcomes a very serious trouble common to all grain-harvester binders as heretofore constructed.

What I claim as my invention, and desire to secure by Letters Patent, is—

1. In a grain-harvester binder, in combination, a pair of grain-elevator belts, a binder-deck between the binder mechanism and elevator-belts to receive the grain from said belts, a packer system to force the grain binderward on said binder-deck, a cord-needle, a breastplate, a grain-gate pivotally connected to said breastplate, an ejector, a binder-deck cover located between the binder mechanism and said elevator-belts, mechanical means to first move said gate upward from the needle and then downward and grainward after said cord-needle has entered into said breastplate to move the accumulated grain grainward from the back of said cord-needle to effect a separation of the unbound from the bound grain for the free action of said ejector.

2. In a grain-harvester binder, in combination, a pair of grain-elevator belts, a binder-deck between the binder mechanism and elevator-belts to receive the grain from said belts, a packer system to force the grain binderward on said binder-deck, a cord-needle, a breastplate, a grain-gate pivotally connected to said breastplate, a binder-deck cover located between the binder mechanism and said elevator-belts, an ejector, a cam-wheel operated from the knotter-shaft to operate said grain-gate to move same grainward after said cord-needle's entrance into said breastplate to effect a separation of the unbound from the bound grain for the free action of said ejector.

3. In a grain-harvester binder, in combination, a breastplate, its grainward end formed with an angle to the path of the cord-needle's entrance above the line of the flow of the grain binderward, a grain-space on the grainward end of said breastplate back of and above the cord-needle's circuit, a grain-gate pivotally supported by said breastplate grainward from said angle to guide the grain below said angle while the gavel is being formed, mechanical means to elevate said grain-gate in advance of the binderward movement of the cord-needle for the purposes set forth.

4. In a grain-harvester binder, in combination, a vibrating grain-gate supported by the breastplate, near the cord-needle's entrance, means to mechanically operate said grain-gate to close the opening at the grainward end of the breastplate, and upon the approach of the needle to move said grain-gate upward that the surplus grain may pass into said opening back of and above said cord-needle, and thereafter to swing the gate downward and grainward to force said grain grainward and hold it from the ejector in discharging the gavel.

5. In a grain-harvester binder, in combination, a breastplate with a portion thereof at an abrupt angle to the path of the cord-needle, a cord-needle having a concentric back and operating through a slot in said breastplate, a grain-gate pivotally connected to said breastplate, mechanical means to hold said gate to cover said angular portion while the gavel is accumulating and move said grain-gate upward in advance of the upward movement of said cord-needle, and then downward and grainward to free the back of said cord-needle from the accumulated grain in its return movement.

6. In a grain-harvester binder, in combination, a cord-needle, a breastplate, a grain-gate pivotally connected to the grainward end of said breastplate above the flow of the grain, a grain-receptacle grainward of said grain-gate, a knotter-shaft, a gavel-ejector, an actuating-rod, a yielding mechanism connected therewith to operate said grain-gate, one end of said rod pivotally connected to said grain-gate, a driving mechanism operated by said knotter-shaft, to which the opposite end of said rod is pivotally connected, said yielding mechanism adapted to yield against the movement of said grain-gate as said grain-gate is moved grainward from the back of said cord-needle in advance of said needle for the purpose of holding the unbound grain from the bound gavel while being discharged.

7. In a grain-harvester binder, in combination, a grain-binder deck, a cord-needle, a breastplate above the binder-deck, a binder-deck cover between the elevators and said breastplate, a grain-gate pivoted upon said breastplate, a cam located upon the tier-wheel shaft of the binding mechanism, a link connection from said cam to said grain-gate, acting first to raise said grain-gate and provide space for the loose grain as raised by the upward movement of said cord-needle, and then acting to move said grain-gate downward and grainward to hold the unbound grain away from the bound gavel that the ejector may pass around said gavel freely without interfering with the unbound crop for the free and easy discharge of the bound gavel.

8. In a grain-harvester binder, in combination, a grain-receiving receptacle between the elevator and binder mechanism, a binder-deck cover between the elevator and binder mechanism, a breastplate above said grain-receptacle, a cord-needle, its shaft located below said grain-receptacle, the grainward end of said breastplate formed at a right angle to the path of said cord-needle, a grain-gate pivotally connected to the grainward end of said breastplate, means for operating said grain-gate in connection with said cord-needle and breastplate, to cause the grain-gate to first

rise upward as the cord-needle advances, forming a grain-space back of and above said cord-needle and after the point of said cord-needle has entered said breastplate to move said grain-gate downward and grainward to separate the unbound grain from the bound gavel and to return said grain-gate to its normal condition when said cord-needle is at rest to guide the inflowing grain smoothly under said breastplate to the knot-tying mechanism.

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

WILLIAM N. WHITELY.

Witnesses:
JOHN L. GILLIGAN,
ROBERT WEISKOTTEN.