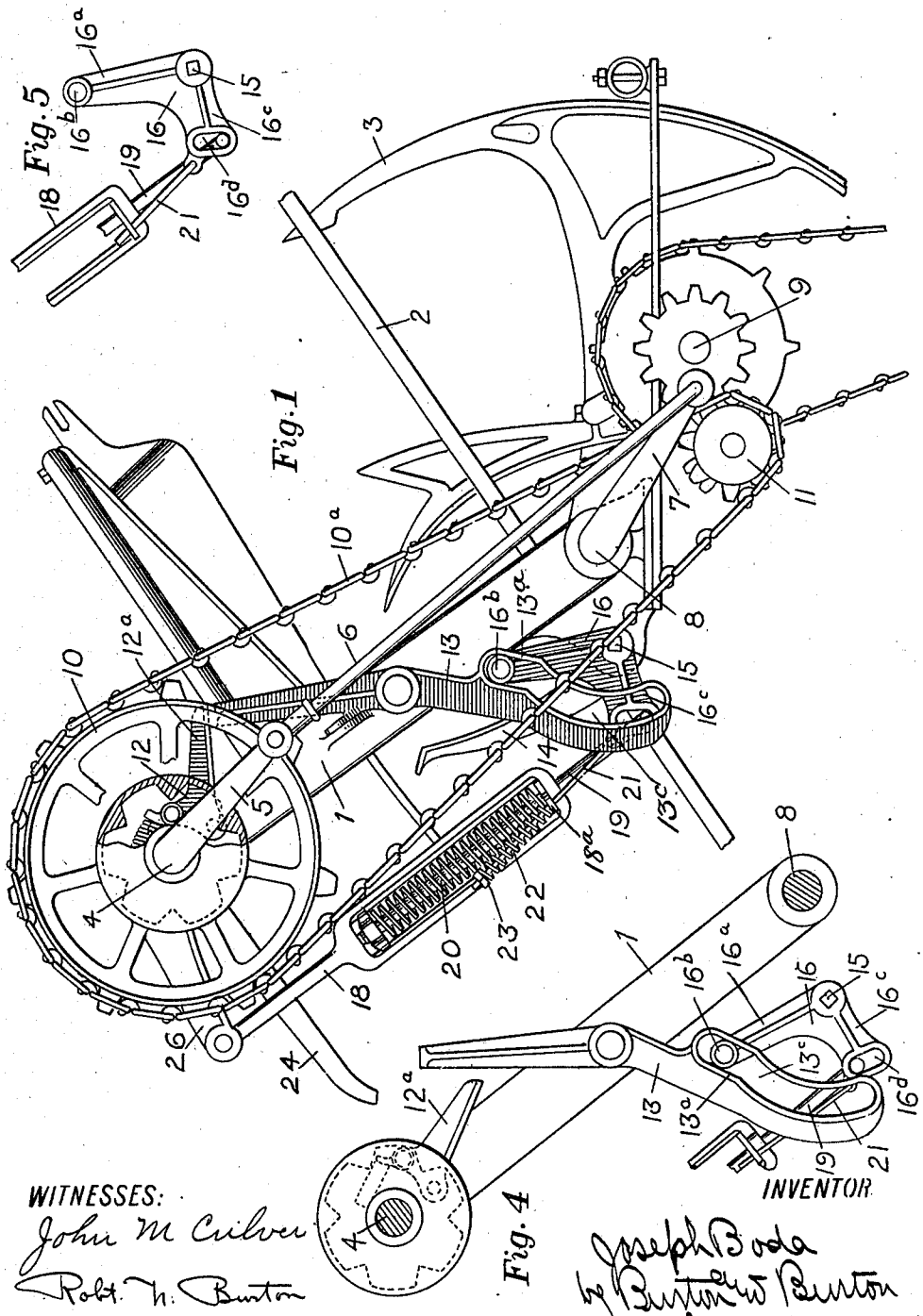
J. BODA.

COMPRESSOR AND TRIP MECHANISM FOR GRAIN BINDERS.

APPLICATION FILED SEPT. 29, 1909.

**974,348.** **Patented Nov. 1, 1910.**

2 SHEETS—SHEET 1.




THE NORRIS PETERS CO., WASHINGTON, D. C.

J. BODA.

COMPRESSOR AND TRIP MECHANISM FOR GRAIN BINDERS.

APPLICATION FILED SEPT. 29, 1909.

**974,348.** **Patented Nov. 1, 1910.**

2 SHEETS—SHEET 2.

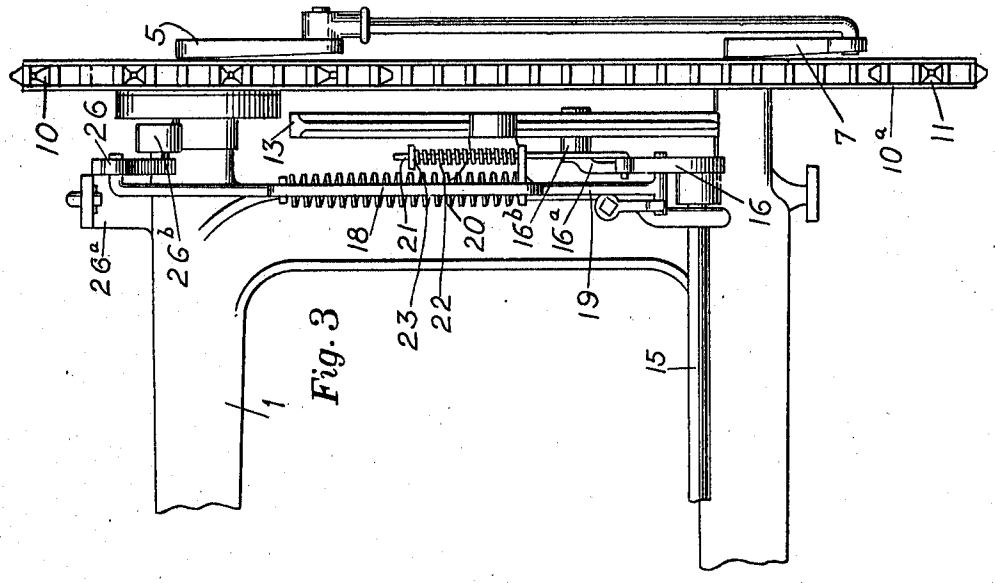



Fig. 3

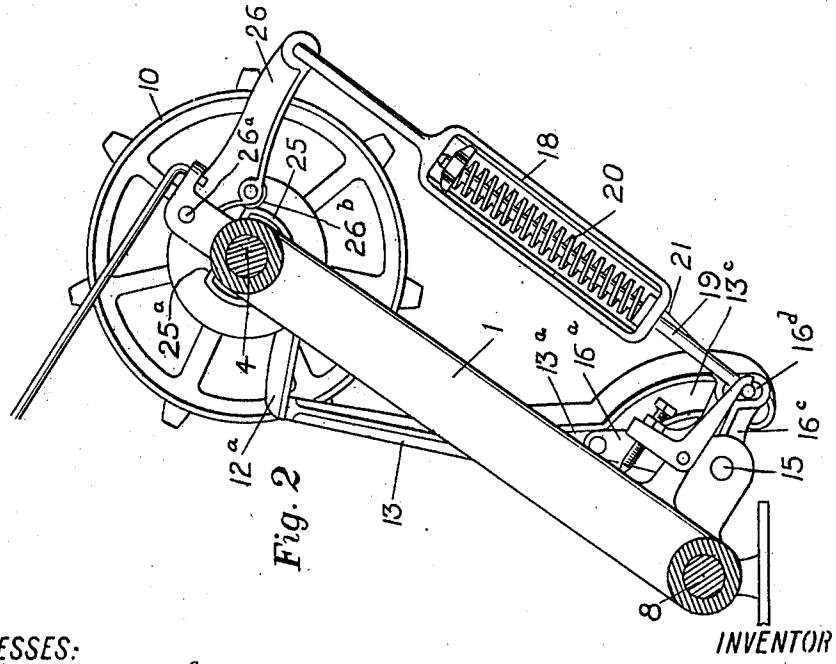



Fig. 2

WITNESSES:

John M Culver

Robt. H. Burton

INVENTOR

Joseph Boda

by Burton & Burton

his attys

THE NORRIS PETERS CO., WASHINGTON, D. C.

# UNITED STATES PATENT OFFICE.

JOSEPH BODA, OF PLANO, ILLINOIS, ASSIGNOR TO INDEPENDENT HARVESTER COMPANY, OF PLANO, ILLINOIS, A CORPORATION OF MAINE.

## COMPRESSOR AND TRIP MECHANISM FOR GRAIN-BINDERS.

974,348. Specification of Letters Patent. Patented Nov. 1, 1910.

Application filed September 29, 1909. Serial No. 520,059.

*To all whom it may concern:*

Be it known that I, JOSEPH BODA, a citizen of the United States, residing at Plano, in the county of Kendall and State of Illinois, have invented new and useful Improvements in Compressor and Trip Mechanism for Grain-Binders, of which the following is a specification, reference being had to the accompanying drawings, forming a part thereof.

The purpose of this invention is to provide an improved construction in the compressor and trip of a grain binder.

It consists in the features of construction and their combinations which are shown and described as indicated in the claims.

In the drawings:—Figure 1 is a front side elevation of a binder mechanism having embodied in it this invention. Fig. 2 is a rear side elevation of the same with some parts omitted. Fig. 3 is a discharge side elevation of the same showing only the mechanism at the forward end of the binder. Fig. 4 is a detail forward side elevation of the compressor and trip connections. Fig. 5 is a detail elevation of a portion of the same part shown in Fig. 4, showing the parts at a different stage in the operation.

The drawings show a familiar construction of grain binders in respect to the principal parts comprising the binder frame or standard, 1, deck, 2, binder arm or needle, 3, main binder shaft, 4, having a crank arm, 5, connected by a link, 6, with the lever arm, 7, of the needle rock shaft, 8. The drawings also show the continuously operating packer shaft, 9, from which power is communicated to the main binder operating wheel, 10, by a train which comprises a sprocket wheel, 11, and chain, $10^a$, extending about said sprocket wheel and the wheel, 10, as in many familiar types of grain binders.

The wheel, 10, is clutched to the main binder shaft, 4, by a familiar form of clutch requiring no description beyond mention of the tripping dog, 12, whose lever arm, $12^a$, extends in position for encounter by the trip lever, 13, which is fulcrumed on the binder standard. A trip arm, 14, is provided for receiving the pressure of the bundle for tripping and also for operating as the outer compressor. Said trip arm is rigid with a trip and compressor rock shaft, 15, journaled below the deck. At the forward end of said rock shaft, there is rigid with it a bell-crank lever, 16, of which the arm, $16^a$, extends up alongside the trip lever, 13, and is provided with a stud-and-roll abutment, $16^b$, which engages a cam track, $13^a$, in the trip lever, 13. The other arm, $16^c$, of the bell crank has a slot, $16^d$, at which it is connected with the lower end of the compressor link, which is of familiar construction, comprising two members, 18 and 19, extensibly connected together and having the compressor spring, 20, interposed between them to yieldingly resist the extension of the link. The said arm, $16^c$, of the bell-crank lever, 16, has also connected to it a link, 21, which extends through a forwardly jutting eye, $18^a$, on the lower end of the member, 18, of the compressor link; and above said eye there is coiled about said link, 21, the trip spring, 22, stopped at its upper end by a nut, 23, screwed on to said link, 21, for adjusting the tension of the trip spring.

When the pressure of the accumulating bundle against the trip and compressor, 14, becomes sufficient to rock the shaft, 15, against the resistance of the trip spring, 22, the rocking movement of the bell-crank lever causes the abutment, $16^b$, at the upper end of the arm, $16^a$, of said lever engaged with the cam slot, $13^a$, of the trip lever, 13, to rock said trip lever about its fulcrum in direction for disengaging its upper end from the arm, $12^a$, of the trip dog, 12, thereby causing the binding mechanism to be set in motion. The amount of movement of said bell crank necessary for thus disengaging the trip connections and initiating the movement of the binder mechanism is less than the play provided by the slot, $16^d$, at the engagement of the bell crank lever with the compressor, 19, so that no compression of the compressor spring, 20, occurs until after the binder starts. The cam slot, $13^a$, at the upper part at which the abutment, $16^b$, is engaged with it at the position of rest is shaped for a short distance only so as to cause the rocking of the bell-crank lever to swing the lever, 13, about its fulcrum, and said lever is thus swung only to sufficient distance to disengage its upper end from the trip dog. The remainder, $13^c$, of the cam slot is curved with a radius equal to the length of the arm, $16^a$, of the bell-crank lever and from the time the abutment, $16^b$,

reaches said curved portion, 13c, said portion stands in the normal path of said abutment throughout the remainder of the rocking movement of the bell crank which may be caused by further swinging outward of the compressor and trip arm, 14. The discharge arm, 24, which is secured in the usual position on the knotter-actuating wheel (not shown), and occupies a position about the axis of the shaft, 4, with respect to the needle-operating crank arm, 12a, which is seen in Fig. 1, operates in the usual manner for discharging the bundle.

The compressor link is controlled in the usual way by a cam flange 25, on the wheel 10, which upholds the lever arm 26, fulcrumed on the binder frame or standard at 26a, and connected at its outer end to the upper end of the upper member 18, of the compressor link. The cut away portion 25a, of the cam flange 25 reaches the abutment 26b, on the lever 26, substantially at the time the discharge arm reaches the bundle for ejecting it and the compressor is thus permitted to drop out of the path of discharge of the bundle, the rock shaft 15, and bell crank lever arm 16a, moving through an arc of substantially ninety degrees in the process of discharge, and in this movement the abutment 16b, on the lever arm 16a, moves as stated in the curved portion of the cam track 13c, without causing any substantial movement of the trip lever 13, and when the continued rotation of the wheel 10, causes the cam flange 25, to swing the lever 26, upward for retracting the compressor trip to operative position ready for the next bundle, the reverse movement of the bell crank 16, while the abutment 16b is traversing said portion of the cam track, occurs without causing movement of the trip lever which is however moved back into the position for encounter of its upper end with the trip dog 12, by the upper straight portion of the cam track 13c which is traversed at the closing part of the inward movement of the compressor trip 14. In such retracting movement of the compressor trip it will be observed that the bell crank 16, is directly actuated by the lifting action on the outer end of its arm 16c, of the link 21, rather than by the lower end of the compressor link 19, because of its slotted connection of said member 19, at its lower end with said bell crank lever arm.

It will be obvious that the provision of the closed cam 13c, on the trip lever 13, for the engagement of the bell crank 16, causing the rocking movement of the compressor rock shaft to actuate the trip arm position in both directions, and the provision of the trip spring 22 interposed as shown in the connection made by the link 21 between the bell crank and the compressor link, obviating the necessity for any spring-acting directly upon the trip lever for throwing it into position for engaging the trip dog, results in avoiding any spring pressure acting upon the connection between the bell crank and the trip lever during the rocking of the compressor 15, outward for discharge of the bundle and during its return; that is while the abutment 16, on the bell crank is traversing the curved portion 13c, of the cam; and the avoidance of such pressure which would increase the friction and tend to embarrass the action, is the purpose of employing a closed cam to produce positive actuation of the lever in both directions.

The slotted connection between the arm 16c, of the bell crank and the lower member 19, of the compressor link, and the connection which is without such play between the said arm 16c, and the link 21, causes the yielding movement of the compressor trip arm for rocking the trip lever to disengage it from the finger 12a, of the trip dog to be resisted only by the spring 22, which may therefore be of suitable tension for that purpose only, and much lighter than is necessary for the compressor spring. It will be understood that the slot 16d, corresponds in length to the straight portion of the cam slot 13a, so that the trip lever is fully moved for disengagement from the trip dog in the rocking movement of the compressor arm, which is accommodated by the slot 16d without bringing into action the compressor spring.

I claim:

1. In a grain binder, in combination with the trip lever, trip rock shaft and yieldingly extensible compressor link comprising two members and a compressor spring interposed between them; a lever on the rock shaft which connects it with the trip lever; a cam constituting said connection, said lever on the rock shaft having a slotted connection with one member of the extensible compressor link; a link connecting said lever with the other member of the compressor link, and a spring interposed in the last mentioned connection.

2. In a grain binder, in combination with the trip lever, trip rock shaft and yieldingly extensible compressor link comprising two members and a compressor spring interposed between them; a lever on the trip rock shaft; a cam on the trip lever engaged by said rock shaft lever, one portion of the cam track being curved in an arc whose radius is the length of the arm of the rock shaft lever which engages the cam, and the portion at one end of said curved portion being deflected out of the curve; said rock shaft lever having slotted connection with one end of the compressor link, the play at said slotted connection corresponding in extent to said deflected portion of the cam track; a link from said rock shaft lever connected with the other member of the com-

pressor and a spring interposed in such connection.

3. In a grain binder, in combination with the trip lever, trip rock shaft and yieldingly extensible compressor link comprising two members and an interposed compressor spring, a closed cam on the trip lever, a lever on the rock shaft having an arm provided with an abutment engaging said closed cam, said rock shaft lever being connected with the lower member of the extensible link, and an independent connection from said lever to the upper member of the link.

4. In a grain binder, in combination with the trip lever, trip rock shaft and yieldingly extensible compressor link comprising two members and an interposed compressor spring, a bell crank on the rock shaft, a cam on the trip lever with which one member of the bell crank is engaged, the other member having slotted connection with the lower member of the compressor link, the upper member of the link having an offset eye; a link from the slotted arm of the bell crank extending through said eye; a spring coiled above the eye and a stop on the link for the end of the spring remote from the eye.

5. In a grain binder, in combination with the trip lever, trip rock shaft and yieldingly extensible link comprising two members and an interposed compressor spring; a bell crank on the trip rock shaft; a cam on the trip lever with which one arm of the bell crank is engaged, the other arm of the bell crank being connected with the lower member of the compressor link with play at its connection longitudinally with respect to the link, a second link connecting said bell crank lever to the upper member of the compressor link, and a spring interposed in the last mentioned connection.

In testimony whereof, I have hereunto set my hand, in the presence of two witnesses, at Plano, Illinois, this 21 day of September, 1909.

JOSEPH BODA.

In the presence of—
J. W. LONG,
A. M. EDSLOW.