(No Model.) 2 Sheets—Sheet 1.

E. E. DAVIS.

GRAIN BINDER.

No. 529,248. Patented Nov. 13, 1894.

Fig. 1.

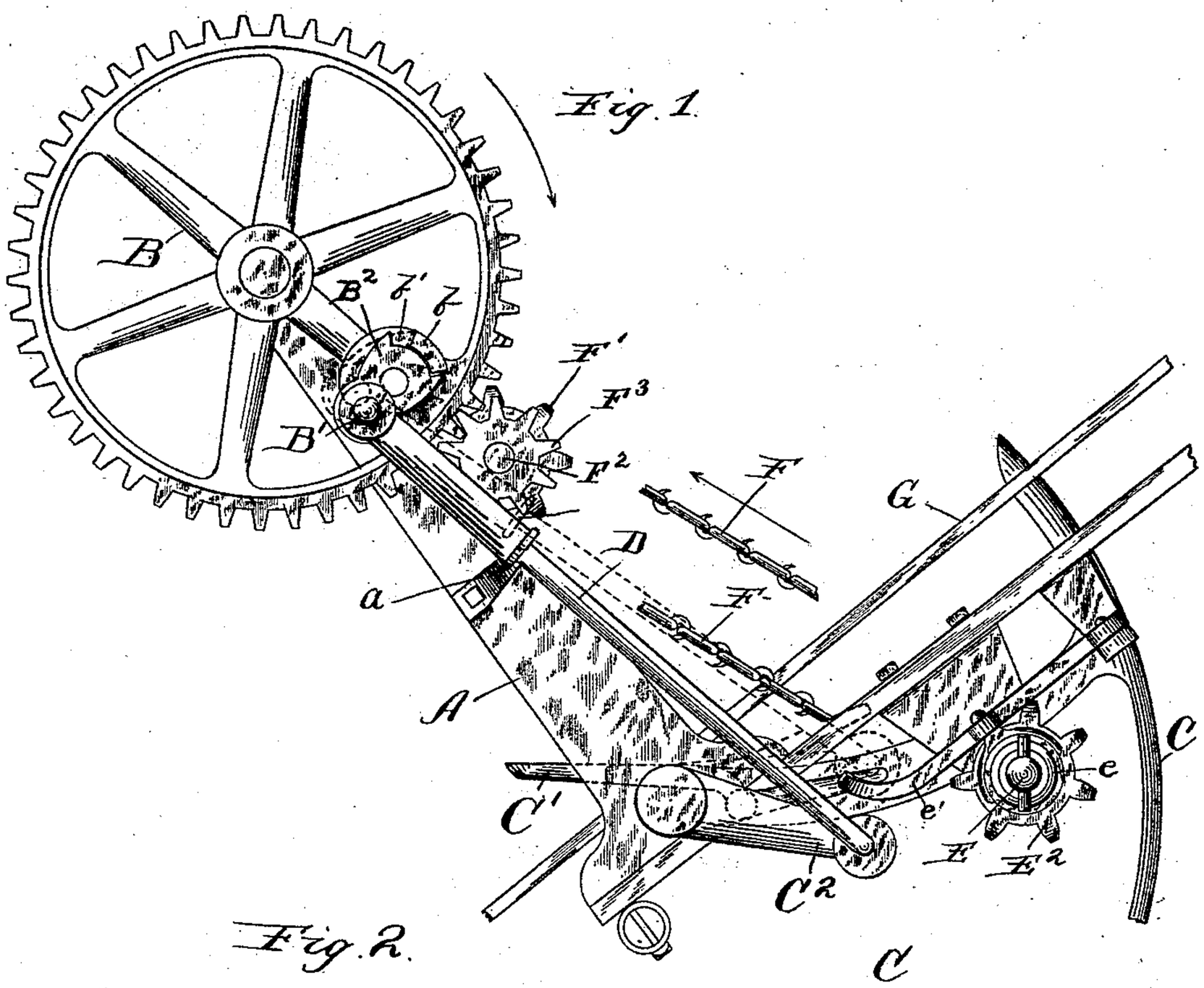
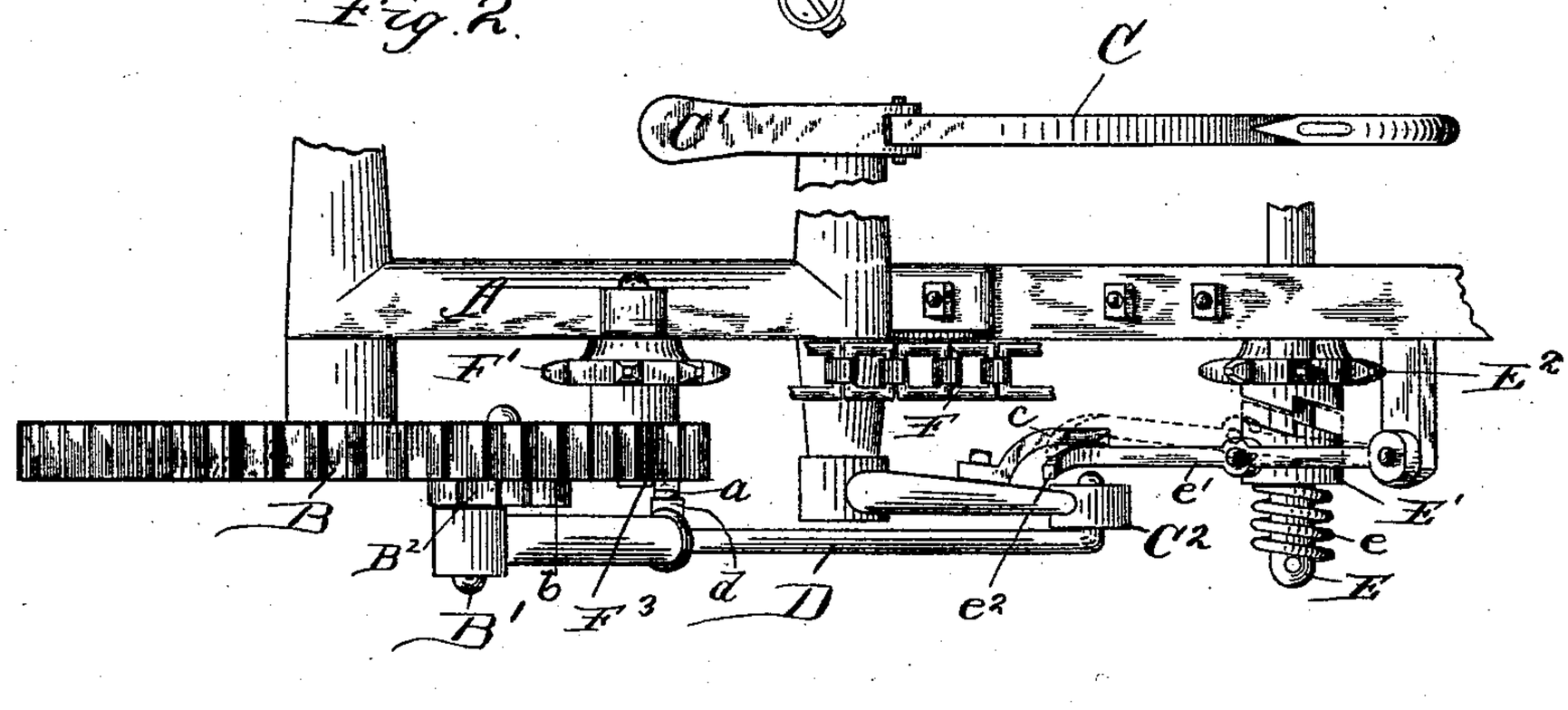


Fig. 2.



Witnesses:

E. T. Dowling

L. L. Morrison.

Inventor:

Eugene E. Davis

(No Model.)

2 Sheets—Sheet 2.

E. E. DAVIS.

GRAIN BINDER.

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Fig. 3.

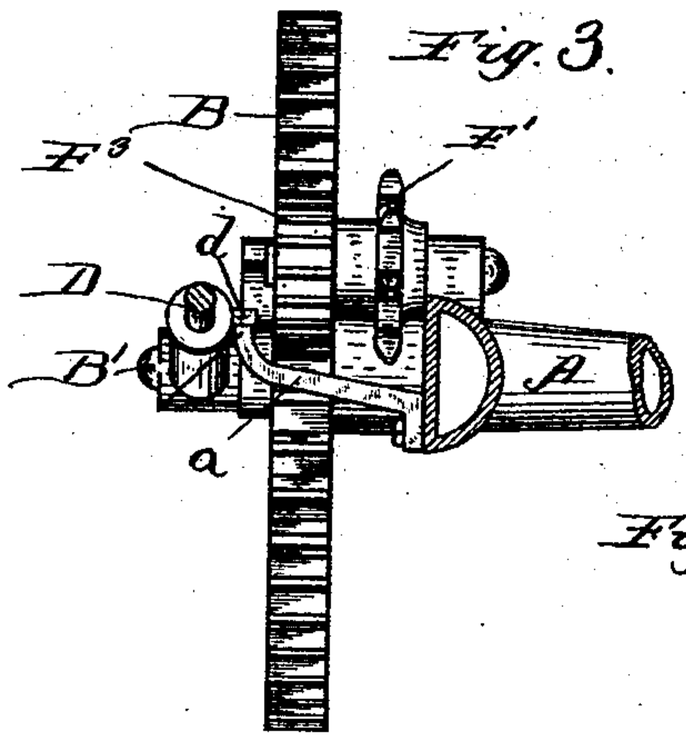


Fig. 4.

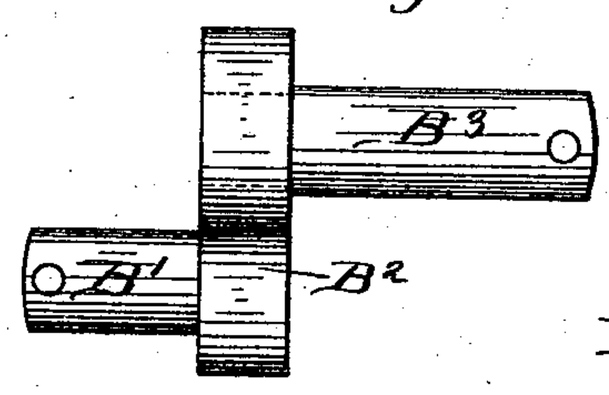


Fig. 10.

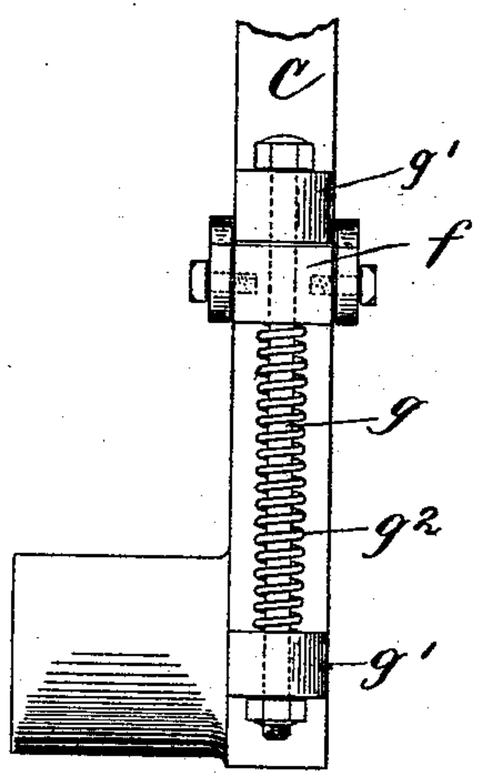


Fig. 11.

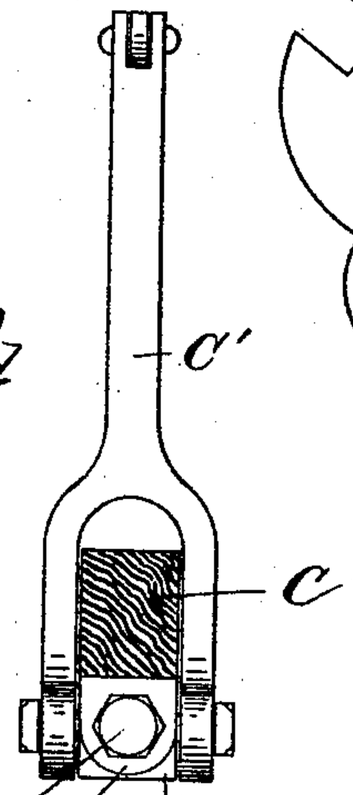


Fig. 5

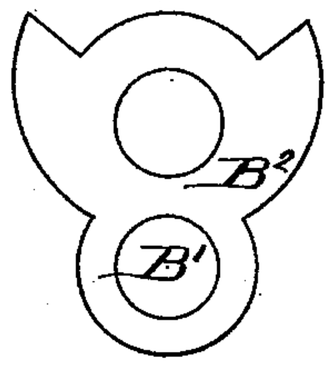


Fig. 6.

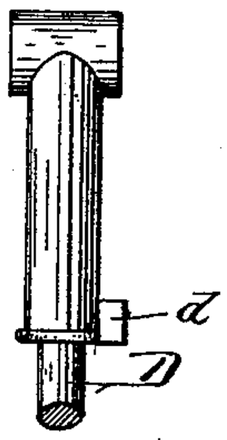


Fig. 7.

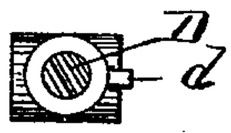


Fig. 8.

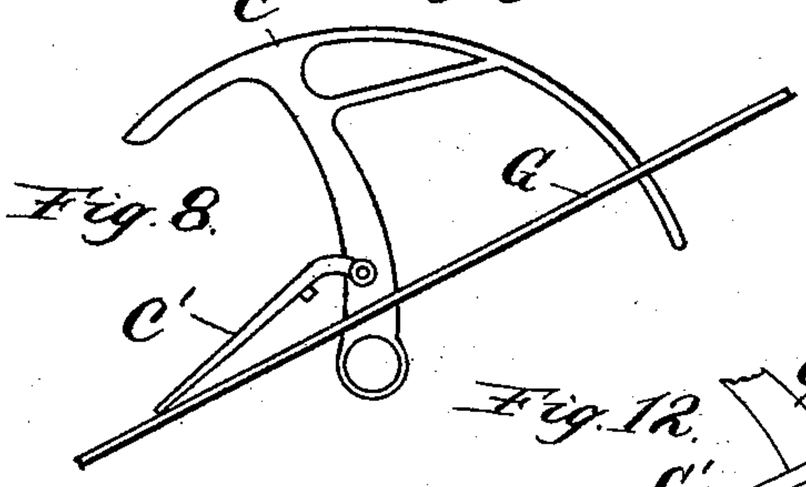


Fig. 9.

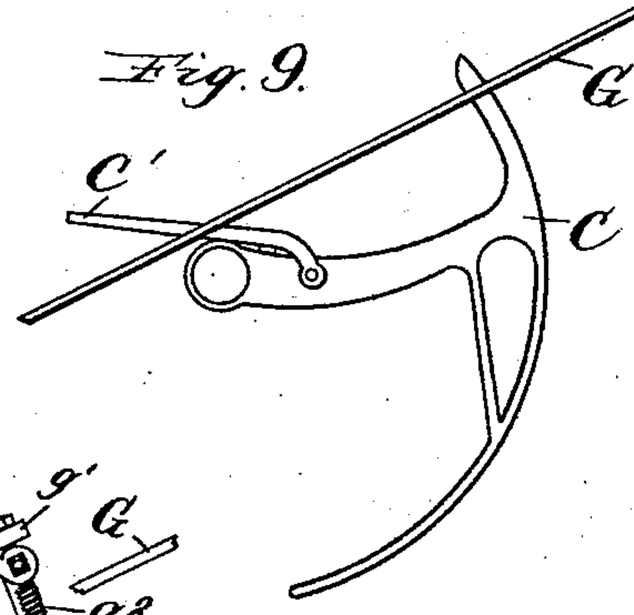
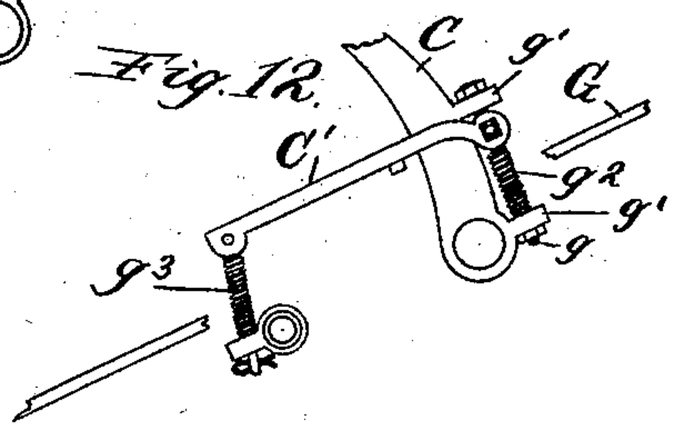


Fig. 12.



Witnesses:

E. T. Dowling.

L. L. Morrison.

Inventor:

Eugene E. Davis

UNITED STATES PATENT OFFICE.

EUGENE E. DAVIS, OF ROCKFORD, ILLINOIS.

GRAIN-BINDER.

SPECIFICATION forming part of Letters Patent No. 529,248, dated November 13, 1894.

Application filed May 23, 1889. Serial No. 311,899. (No model.)

To all whom it may concern:

Be it known that I, EUGENE E. DAVIS, a citizen of the United States, residing at Rockford, in the county of Winnebago, State of Illinois, have invented a new and useful Improvement in Grain-Binders, of which the following is a specification.

My invention relates to needle trips for grain binders, and the objects of my invention are, first, to provide a trip which shall start the binding mechanism from a state of rest by the accumulation of grain; second, to provide a trip which shall also act as a compress in binding the sheaf; third, to improve in general the construction of this part of the grain binder. I attain these objects by the mechanism illustrated in the accompanying drawings, in which—

Figure 1 is an end view of so much of the geared end of the binder as is necessary to show my improvement. Fig. 2 is a plan of the same. Fig. 3 shows binder gear and attachment. Figs. 4, 5, 6, 7, 8 and 9 show details. Figs. 10, 11, and 12 show a modified form of trip and compress.

Similar letters refer to the same parts throughout the several views.

In the drawings A is the binder frame of the usual form.

B is the binder gear on the end of what is usually called the knotter shaft.

C is the needle of the usual form used in binders except as hereinafter noted.

C′ is the needle trip and C^2 the operating arm on the needle shaft.

D is the pitman connecting the needle arm C^2 with the wrist pin B′. The pitman is of the usual form except that on the lower end of the pitman head is a radially projecting lug *d* (Figs. 2 and 7).

On the main frame A is fastened the stop *a* co-acting with lug *d* as hereinafter to be described. The wrist pin B′ is not fastened rigidly to wheel B as is usually done, but upon a crank piece B^2 the spindle of which B^3 is properly pivoted in the said wheel (Figs. 1, 2 and 4). Crank B^2 has a notch *b′* matching with a stop block *b* somewhat smaller than said notch on wheel B which operates to limit the vibratory movement of the said crank. It is readily seen that instead of the construction just described a crank piece B^2 can be used having holes instead of studs and a rigid stud to be fastened in the wheel B and a stud used on the pitman head, resulting in the same movement of the parts. The trip C′ is pivoted to the needle C as shown in Figs. 1, 2, 8 and 9, its free end extending above the deck G whereby it would arrest the grain brought against it, in the manner well understood in binders, and by its pressure starts the mechanism, to be described farther on. The trip C′ is pivoted to the body of the needle arm or to an extension therefrom if so desired.

The driving mechanism of the binder consists of the shaft E to which motion is given in any desired manner, not shown here, as it forms no part of my invention. Upon the end of the shaft is the ratchet clutch E′ kept from turning on said shaft in any well known way, but permitted to move freely endwise on the shaft. The spring *e* moves the clutch into operating contact with the driving sprocket E^2 which turns freely on shaft E when not connected with the clutch. The clutch is thrown out of engagement with the sprocket by guide lever *e′*, the free end of which is bent or beveled at e^2 (Fig. 2) coming into contact with the arm *c* fastened on the needle arm C^2. The chain F passes over sprocket E^2 on shaft E to sprocket F′ on stud F^2 in frame A. The pinion F^3 is either cast integral with sprocket F′ or is fastened rigidly thereto and meshes in the teeth of gear B (Figs. 1 and 2). The operation of my improved needle trip is as follows:

The mechanism is shown at rest in Figs. 1 and 2. The clutch E′ is held out of engagement by the guide lever *e′* resting against the arm *c* and lug *d* in contact with the stop *a*. When sufficient grain has accumulated upon the trip C′, to raise the needle shaft and with it arm C^2 and of course arm *c* which is rigid with arm C^2, until it has reached the position shown in dotted lines (Fig. 1) lever *e′* is released from contact with arm *e*, and lug *d*, by the endwise movement of the pitman, is released from contact with stop *a* so that the clutch E′ is thrown into engagement with sprocket E^2 by the action of spring *e* and

pinion F^3 turns the gear wheel B by which the pitman D draws up the needle in the usual manner well known in the binders. The endwise movement of the pitman is rendered possible by the wrist pin B′ being held in a crank B^2 as shown (Figs. 2 and 4). While the needle is being drawn up the free end of the trip moves down upon the deck and the hinged end is brought up against the gavel serving thereby as a compress while it is being tied (Fig. 8). When the needle is nearly returned to its position of rest the arm *c* engages the bent end e^2 of lever *e*, and withdraws clutch E′ from engagement with spocket E^2, and lug *d* comes in contact with stop *a* and the mechanism remains at rest until again started by the accumulation of the grain upon trip C′, when the operation just described will be repeated.

Instead of the trip C′ being pivoted rigidly to the needle as here shown, it may be pivoted to a block *f* sliding on a rod *g* held in lugs *g′ g′* on the rear edge of the needle arm held in position by spring g^2, or in any other manner by which a yielding support is given to said end, and the front end may also rest upon a spring g^3 as shown, the lower end of which is supported on a part of the binder frame whereby a yielding compression is made upon the gavel while being bound, (Figs. 10, 11 and 12). These improvements may be used in connection with other binders, or certain parts of my inventions can be used with other binders without using the others, and the construction may be varied from what is here shown without departing from the scope of my invention.

I do not claim a needle trip broadly; but

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

1. In a grain binder, the combination of a trip piece pivoted to the needle arm above the shaft, the free end extending upward above the binder deck and backward over the needle shaft whereby it shall engage the incoming grain to rock the needle shaft, a driving sprocket, a clutch to operate said sprocket, a guide lever to operate the clutch, and an arm secured to the needle shaft to operate said lever whereby the driving mechanism is brought to rest and continues so until a sufficient amount of grain is brought upon the trip to start it again in motion, substantially as set forth.

2. The combination of a trip pivoted to the needle above the needle shaft its free end extending upward above the binder deck and backward over the needle shaft to engage the incoming grain and to rock the needle shaft by the pressure of the grain, with means for driving and for locking the binding mechanism, and a releasing mechanism actuated by the rocking of the needle shaft, whereby the needle is operated and the needle trip is brought against the side of the gavel next to the deck whereby the gavel is compressed while being tied, substantially as set forth.

3. The combination of a trip pivoted to the binder needle above the needle shaft extending upward and backward over the needle shaft to engage the incoming grain, and to rock the needle shaft by the pressure thereof, a driving sprocket to operate the binding mechanism, a clutch to engage the driving sprocket, a guide lever to operate the clutch, an arm secured to the needle shaft to engage said lever, a pitman connecting the arm of the needle shaft with a wrist pin or its equivalent having a connection with the binder gear which permits a slight longitudinal movement of the pitman, substantially as set forth.

4. The combination of a needle trip pivoted to the binder needle above the needle shaft, extending upward and backward over the needle shaft above the binder deck to engage the incoming grain and to rock the needle shaft by the pressure thereof, a driving sprocket to operate the driving mechanism, a clutch to engage the driving sprocket, a guide lever to release the clutch, an arm extending from the needle shaft to operate the releasing lever, a pitman to operate the needle, having a stop lug to engage with a stop catch secured to the binder frame, operating substantially as and for the purpose set forth.

5. The combination of a binder gear provided with a wrist pin mounted on a crank pivoted to said gear, and having a limited movement on its pivot, a pitman provided with a lug to engage a fixed stop secured to the binder frame, adapted to be released from the same by an endwise movement of the pitman, and a driving mechanism for a binder operating substantially as and for the purpose set forth.

6. The combination of a needle trip connected with the binder needle by a downwardly yielding fastening and extending over the needle shaft adapted to rock the needle shaft by the pressure of the incoming grain, the free end of the trip sustained by a spring, with a driving mechanism, a clutch to engage the same, and a releasing mechanism whereby the binder is started into operation by the pressure of the grain and the compression of the gavel assisted by the trip, operating on the under side of the same substantially as set forth.

7. The combination of a needle trip pivoted to the needle near the needle shaft, its free end extending upward and over the needle shaft and the binder deck, whereby the grain is arrested by the said trip and the binding mechanism started into operation substantially as set forth.

EUGENE E. DAVIS.

Witnesses:
L. L. MORRISON,
E. F. DOWLING.