4 Sheets—Sheet 1.

# S. D. LOCKE.
## Grain-Binder.

No. 203,168. Patented April 30, 1878.

*Fig. 1.*

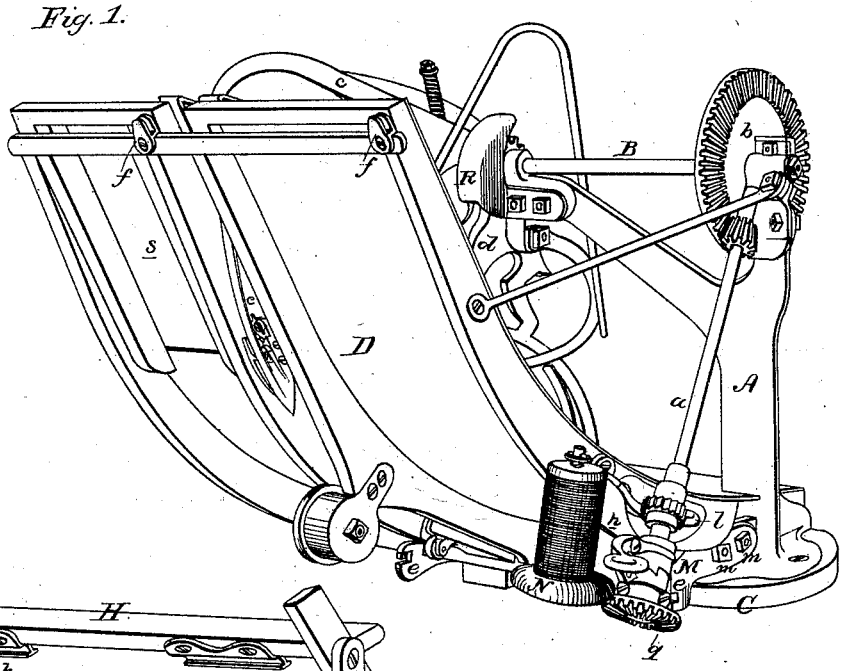
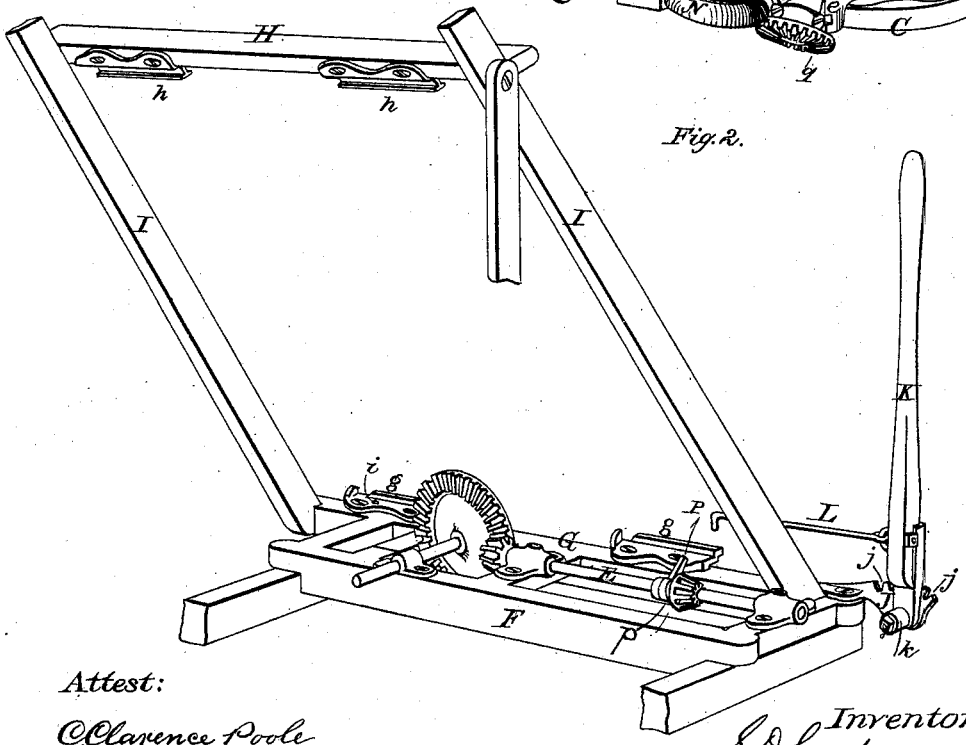



*Fig. 2.*

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J. S. Brown.

Inventor:
S. D. Locke By his atty
R. D. O'Smith

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# S. D. LOCKE.
## Grain-Binder.

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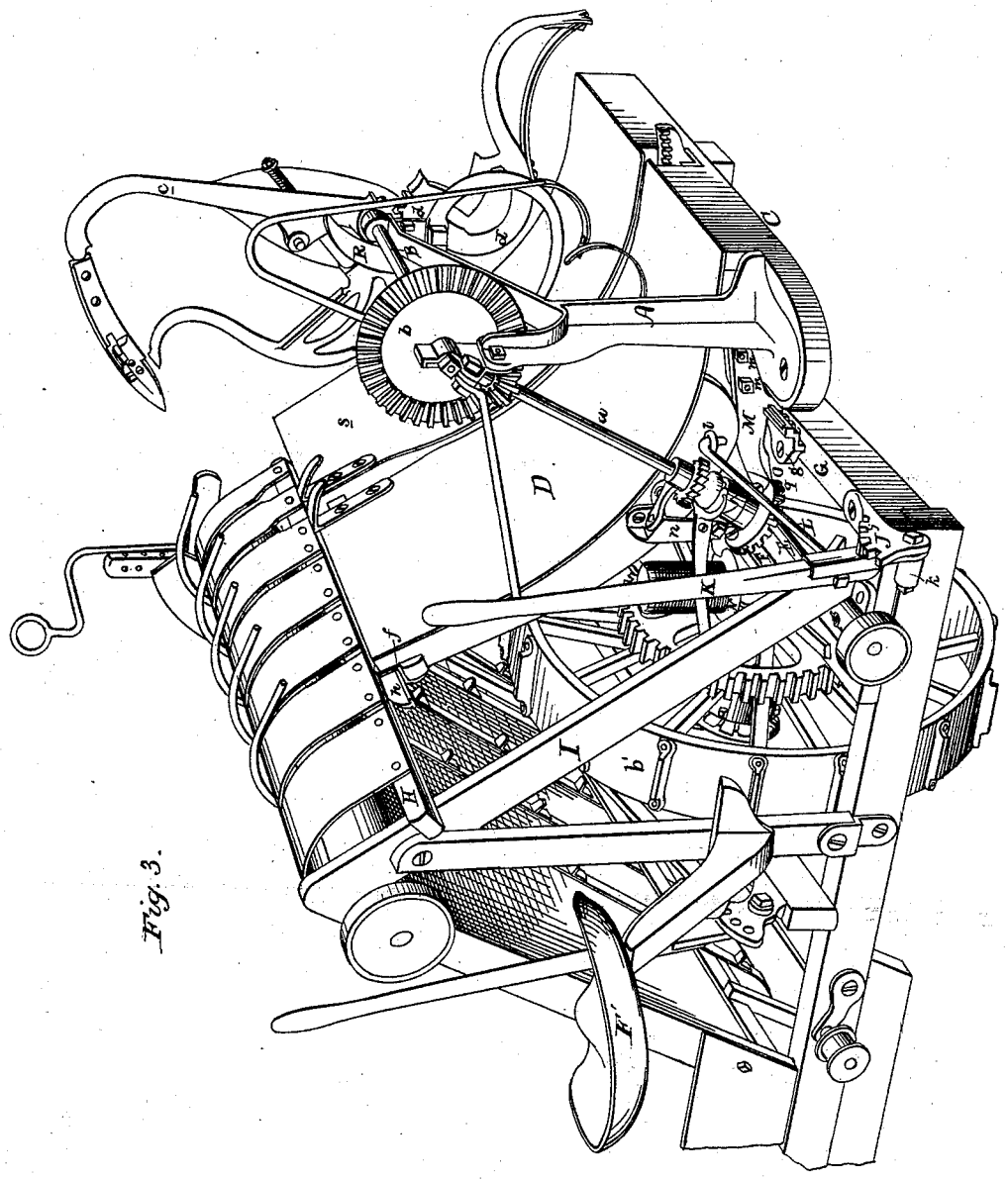

Fig. 3.

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# S. D. LOCKE.
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No. ~~203,168.~~ **Patented April 30, 1878.**

*Fig. 4.*

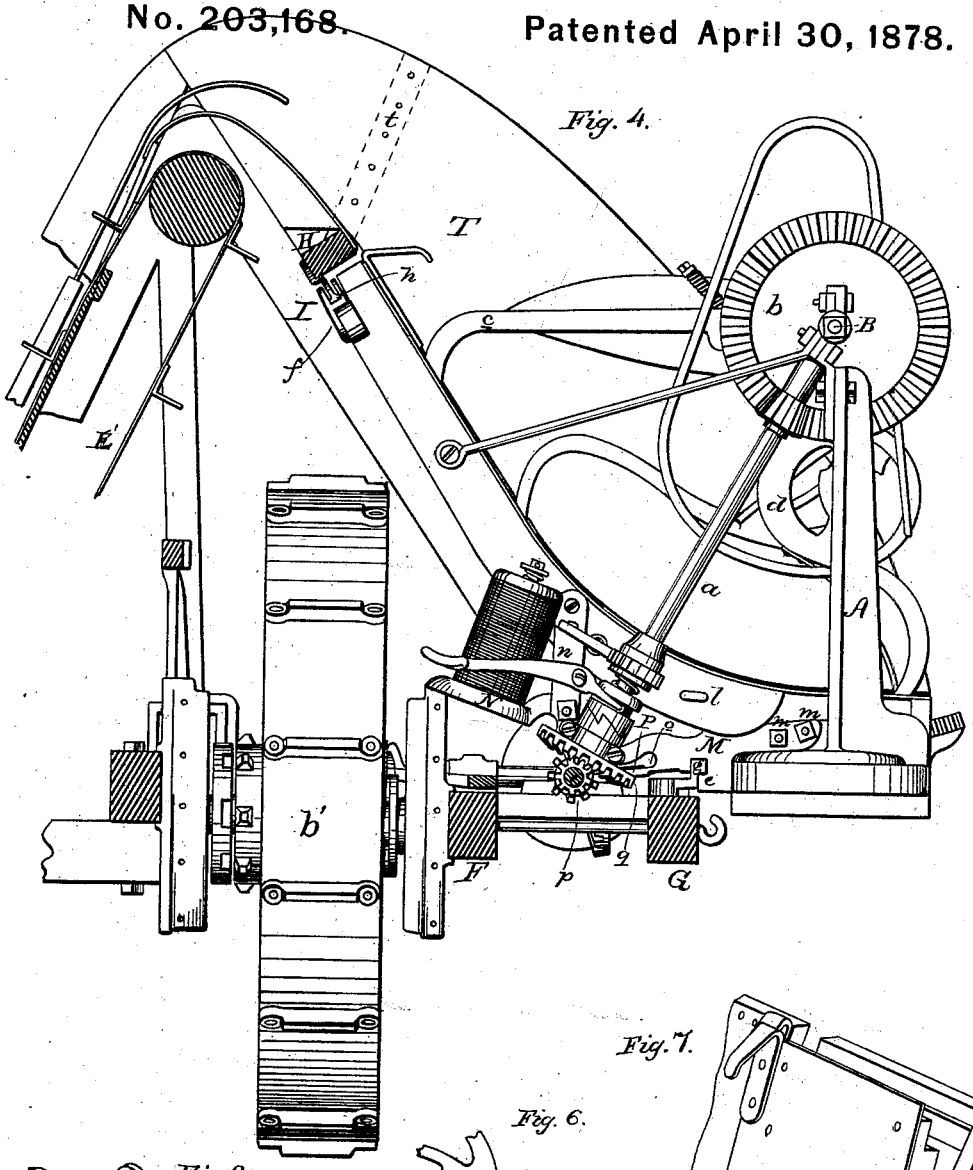



*Fig. 7.*

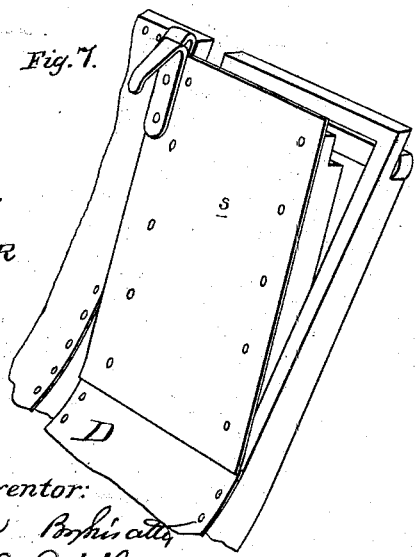



*Fig. 6.*

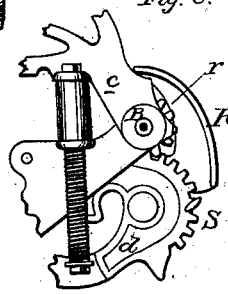
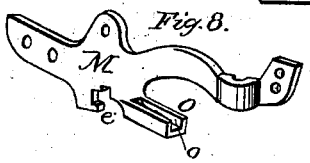



*Fig. 8.*

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# S. D. LOCKE.

## Grain-Binder.

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Fig. 5.

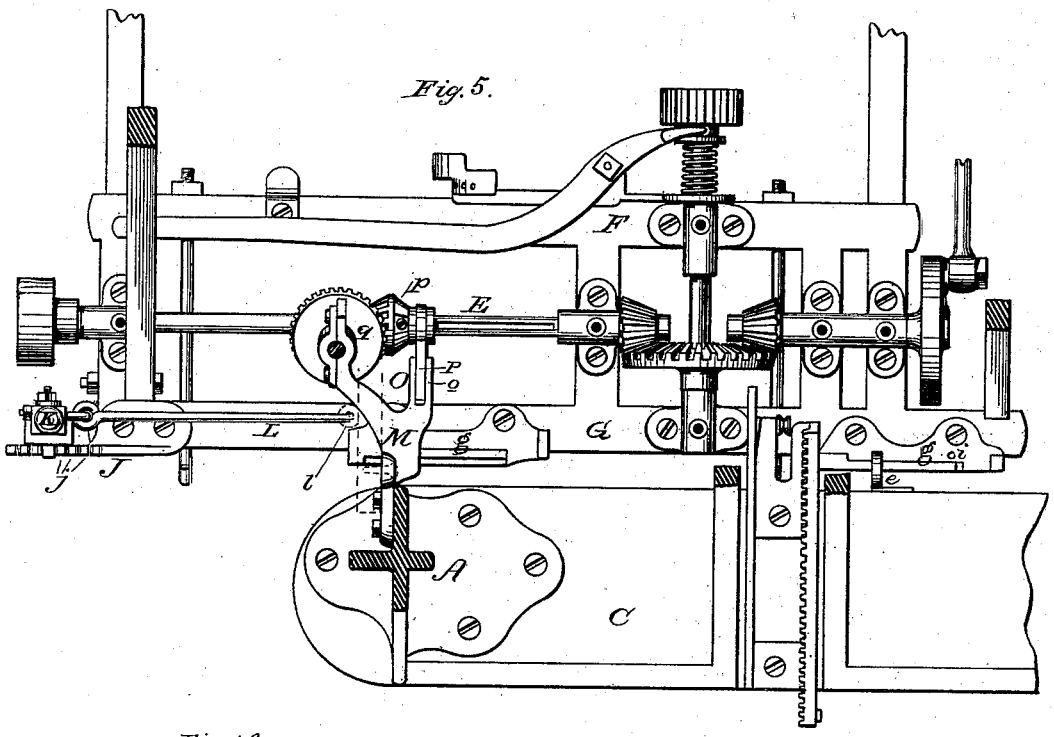



Fig. 13

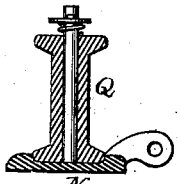



Fig. 9.

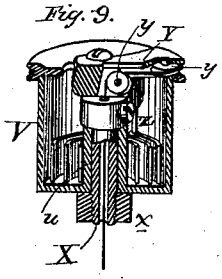
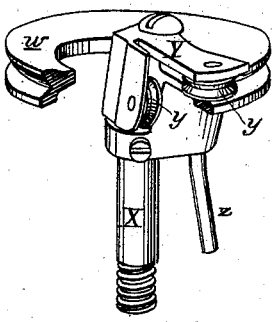



Fig. 10.



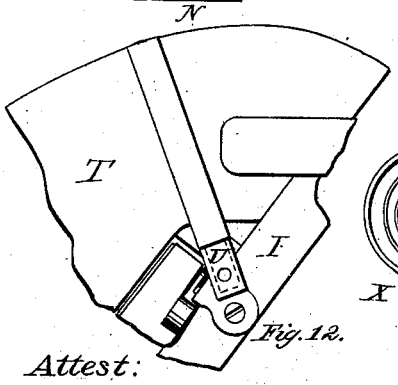
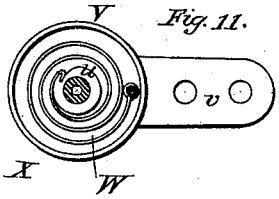




Fig. 12.

Fig. 11.

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J. S. Brown.

Inventor:

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R. D. O. Smith

# UNITED STATES PATENT OFFICE.

SYLVANUS D. LOCKE, OF HOOSICK FALLS, NEW YORK.

## IMPROVEMENT IN GRAIN-BINDERS.

Specification forming part of Letters Patent No. **203,168**, dated April 30, 1878; application filed March 23, 1876.

*To all whom it may concern:*

Be it known that I, SYLVANUS D. LOCKE, of Hoosick Falls, in the county of Rensselaer and State of New York, have invented a new and useful Improvement in Binders for Harvesters, which improvement is fully set forth in the following specification.

This invention relates generally to all the various kinds of automatic binding-machines, as well as to the rotary automatic binding-machine for which I have heretofore received Letters Patent dated November 17, 1871; and the object of the same is to facilitate the handling, management, adjustment, and easy attachment or detachment of the binding-machine from the harvester; and it consists, first, in stationary rails secured to the harvester-frame and to the elevator-frame, and corresponding forks and feet to clasp and slide upon said rails, secured to the binder-frame, the said feet being so fashioned that they clasp said rails, and can only be detached by sliding off the ends of the same, whereby the detachment may be easily effected without the removal of any bolts or catches, and may be prevented by the presence of a removable stop or pin; second, in a peculiarly-shaped foot-bracket, which, in addition, supports the box for the lower end of the counter-shaft and in the peculiar construction of the stand or support of the wire or band spool, to prevent the wire from drawing under the spool as it leaves the spool; third, in a socket-palm extending from the foot-bracket, to receive a collar-stud from the sliding pinion, for the purpose of retaining said pinion in gear with the counter-shaft wheel while the binding-machine is moving along its rails; fourth, in the shield to cover the binding-arm driving-gears, to prevent entanglement of the grain; fifth, in a detachable segment of the cradle, to afford easy access to the mechanism under the cradle; sixth, in the construction of the rotary intermediate take-up.

That others may fully understand my improvements, I will particularly describe them, having reference to the accompanying drawings, wherein—

Figure 1 is a perspective view, from the back, of my binding-machine. Fig. 2 is a corresponding perspective of that part of the harvester-frame. Fig. 3 is a perspective of the binder in place in operative condition. Fig. 4 is a transverse section of the binding-machine and its connected parts of the harvester-frame. Fig. 5 is a plan of the end of the harvester-frame and binder base-plank, showing the foot-connections and driving mechanism for the binder. Fig. 6 is an elevation of the binding-arm segment-gears and their protecting-shield. Fig. 7 is a perspective view, showing the removable section of the binder-cradle. Fig. 8 is a perspective view of one of the foot-brackets. Fig. 9 is a central sectional perspective of the rotary take-up. Fig. 10 is a perspective, showing the roller-piece in position. Fig. 11 is a plan of the take-up case. Fig. 12 is an elevation, showing the wind-board socket. Fig. 13 is a central section of the spool and stand.

In automatic binding-harvesters it is desirable and essential that the grain-receptacle be so constructed as to receive and fully support the grain, and especially that portion coming from the line of the cutter-bar, as, owing to its varied height, denseness of growth, and condition due to wind, hail, rain, grass, and other and manifold causes, the grain is liable to displacement and entanglement, and is frequently delivered as though coming solely from the line of the cutters. It is also desirable to have this receptacle built solidly with the operating parts, so that they may be adjusted together and be immovable as to each other, and that it be mounted upon rails, and be provided with mechanism for its lateral adjustment at will, and during the progress of the machine, to the varying length of the straw and to the elevating and delivering mechanism. I therefore have constructed the receptacle or grain-receiver so that it can be projected at least so far forward as, or in advance of, the line of cut or the front line of the elevating or delivering mechanism, and that it shall provide a full support of the unbound bundle, and have mounted this receptacle, and indeed my whole binding-machine, upon rails constructed in any desired form, which permit it to traverse or slide back and forth, and have provided it with a holding and control-

ling mechanism, whereby the driver can, at will, unlock, and move said receptacle and binding apparatus along its rails, and then sesure or lock the same again. The locking and moving mechanism may be constructed in a great variety of forms, and in exhibiting and describing only the simplest structure for that purpose I do not propose to limit myself in any manner to the detail of the structure shown.

In the several figures, A is the main standard or post of my binder. It supports at its top the binder-shaft B, which carries at one end the driving-gear *b*, and at the other end the rotating binder-arm *c*, together with the compressor-arm *d*.

The post A is bolted firmly to the base-plank C, which also supports and forms a part of the frame of the receptacle D, whereon the grain is delivered by the elevator-belts E′. The wheel *b* is driven by the counter-shaft *a* and its pinions, which, in turn, take motion from the shaft E on the main frame F of the harvester, and their prime mover is the main wheel *b′*. These parts correspond with like parts of my binder heretofore patented to me, as above stated, and do not require more particular description.

In general, I will say that the elevator and other parts of the harvester herewith used, or related and joined hereto, are fully shown and described in my application for patent on harvesters of even date herewith, to which application reference is hereby made for more particular description of said parts, without, however, intending to limit this invention to the details of the machines therein described.

The grain-receptacle is connected with the main frame of the harvester by means of forked feet or couplers secured to the former, and engaging with rails properly located and secured to the latter. The forked feet or couplers are shown at *e e f f*, respectively, attached to the receptacle or binders' frame, and their corresponding rails are shown at *g g h h* attached to the harvester-frame. The rails *g g* are attached to the outer edge of the transverse beam G at the extremity of the main frame, and the rails *h h* are secured to the string-piece H near the top of the elevator-frame I. In Figs. 1 and 2 these parts are represented in relative position, but detached. In Fig. 4 they are represented in sectional elevation in position connected.

In placing the binding-machine upon the harvester it is only required that the couplers *f f* should be placed upon the rails *h h* and the feet *e e* on the ledges at the forward end of the rails *g*, when, upon sliding the binder backward, the feet *e e* will immediately move into place upon the rails *g*, and the binder will be mounted and capable of moving back and forth upon said rails, so as to bring the binding-arm *c* more or less nearly opposite the center of the grain-stalks.

But it is required that accidental displacement shall be guarded against, and for that purpose the rails *g g* are made L or T shaped in cross-section at their outer edges, and the feet *e e* are correspondingly shaped, so that when in place upon said rails they cannot be displaced except by slipping to the ends of said rails, or to some point where the L or T flanges are cut away for that purpose. It is evident the end is the most suitable place for such entrance and exit, and that the insertion of a small peg or pin in a hole, *i*, in or a movable stop on one of said rails *g* will effectually prevent any accidental displacement of the binding-machine, while its intentional removal will permit the said binding-machine to be readily detached and taken away.

At the rear end of the main-frame timber G, I attach a segment-notched plate, J, at the axis of which is pivoted the lever K, which is provided with a stud to engage with the peripheral notches *j* of the segment-plate J. A spring, *k*, is placed behind said lever, to keep the same always up and in engagement with the segment-plate notches.

A hook-rod, L, connects said lever to the receptacle or binder-frame by engaging with the eye *l*. When the binder is to be removed from the machine, said hook-rod is disengaged from said eye, and, if desirable, the lever K may itself be removed from the segment-plate J. At the rear end of the binder-frame is a bracket-plate, M, irregular in shape, and combining in itself several offices. It is firmly bolted to the standard A at *m m*, and thence it curves downward and forms the notched foot *e* to receive the rail *g;* thence it is divided. One branch curves outward and forms one-half the box for the lower end of the counter-shaft *a*, and has a projection beyond said box for the attachment of the brace *n*, which is secured at one end to the receptacle or binder-frame, and supports the outer end of said bracket and the counter-shaft box. The spool-stand N is also attached to the outer end of said bracket M.

The other branch of said bracket curves inward and outward, and forms a horizontal palm, O, provided with a rectangular socket or recess, *o*, to receive a collar-stud, P, attached to the pinion *p*, which meshes with the bevel-wheel *q* at the lower end of the shaft *a*. The pinion *p* slides upon the feather on the shaft E, or has a stud or dowel sliding in a slot in the shaft, and is kept in proper mesh with the wheel *q* by the stud P in the socket *o*, and said pinion is thereby caused to slide back and forth upon said shaft without disturbing the proper driving-mesh.

When the binder is removed the collar-stud readily withdraws from the socket *o;* but when the binder is replaced the stud must be replaced in the socket.

When wire is drawn off from a reel or spool there will be frequently a tendency to form slack, either by the momentum of the spool or from a little giving back on the part of the drawing-off mechanism; and when this hap-

pens there is liability that the wire will get over the end of the spool and draw in around the spindle or mandrel, resulting in a breakage of the wire or stoppage of the machinery. Such an event is peculiarly annoying in automatic binding-machines; and to render it impossible I construct my spool-stand N with a socket-seat for the spool Q, as shown in Fig. 13, and it is then impossible for the wire to draw under it. There is in this case no danger that the wire will draw over its upper end, because of the vertical position of the spool, which will cause the weight of the wire to depress it constantly.

The segment-gears *r* S at the end of the shaft B, whereby the compressing-arm *d* is actuated, are sometimes liable to be clogged and entangled with the grain-stalks which may be carried up by the rotary arm or blown by the wind; and I have therefore covered and protected said gears by a shield-plate, R, which is firmly bolted to the side of the post A, as shown in Fig. 1.

It is frequently necessary to obtain access to the mechanism beneath the cradle D—as, for instance, in case the wire is to be led through the take-up and the machine prepared for starting, &c.; and I therefore make a section, *s*, of the receptacle D removable, as shown in Figs. 1 and 7.

The wind-guard T is provided with a transverse cleat, *t*, which extends across the upper end of said wind-guard, and its lower end is projected far enough to enter a metallic socket, U, bolted to the upper end of the forward bar of the elevator-frame I, where it may be secured with a pin, if required.

The rotary intermediate take-up is composed of a cylindrical case, V, provided with a hollow axial stud, *u*, and a lug, *v*, projecting laterally from its base, for the purpose of secure and permanent attachment to the frame of the binder. The axial stud or hub part *u* is provided with a groove or pin on one side for the attachment of the inner end of the coiled spring W.

The cover of the case V is a circular plate, *w*, having a peripheral groove to receive and hold the slack wire to be taken up, and a tubular axis-stud, X, which passes down through, and is fitted to, the axial stud *u*, and is secured therein by a nut, *x*, or other suitable device. A separate plate, Y, bearing two small grooved rollers, *y y*—one of them in the plane of the above-mentioned peripheral groove and the other in the plane of the axis—is secured to the plate *w* by a single screw. A stud, *z*, projecting downward from the cover *w*, engages with the outer end of the coiled spring W.

The end of the wire is brought from the spool Q to the bottom stud X, and passed through the same from the rear, as shown in Fig. 9. The said end is pushed through said stud and past the axial roller *y* without difficulty, because it is a straight course. The hand then seizes it and pulls a sufficient length of it through to enable it to be passed over the peripheral roller *y*, through the space alongside of the plate Y, and several times around the plate *w* in its peripheral groove. Said wire end is then taken to the binding-head at the extremity of arm *c*, and secured therein.

The revolution of the plate *w* upon a long stud, X, is much more steady and less liable to derangement than as heretofore arranged; and the adjustment of the small rollers *y y* upon a single detachable plate, Y, and the straight unobstructed passage for the wire through the axis of the take-up, and thence by winding around the take-up without the necessity of threading through holes or under rollers, makes this take-up very easy of management or repair.

It will be observed that, in operation, the elevating mechanism or elevator E′ delivers the grain as it is cut by the harvester continuously or in a continuous stream into the receptacle D, where it is taken by the binding-arms *c* and *d* and automatically separated into gavels, and bound and discharged upon the ground; and that the driver in the seat F′, by means of the lever R, can, at will and without stopping the progress of the machine or any part of the work, slide the receptacle D forward or back to adjust the band centrally to the varying length of the grain delivered by the elevator.

Having described my invention, what I claim as new is—

1. The combination of hooking-feet *e* on the grain-receptacle and flanged rails *g* on the main frame with a removable stop or pin, substantially as described.

2. An automatic binding-machine provided with the forks *f f* at the top and the hooked feet *e e* at the bottom, attached to the main frame of the harvester by the rails *h h* and the flanged rails *g g*, substantially as set forth.

3. The bracket M, substantially as described, comprising in itself one of the feet *e*, a support of the lower box of shaft *a*, and for the spool-stand N and the socket-palm O, as set forth.

4. The pinion *p*, sliding upon the shaft E, and provided with a collar and stud, P, combined with the palm O, secured to the binder-frame, constructed with the socket *o* to receive and hold said stud and pinion in a fixed relation with the wheel *q*.

5. The wire-spool Q, combined with a stand, N, constructed with a sunken or recessed seat to receive one end of said spool, for the purpose set forth.

6. The binding and compressing arms *c d* and the segment-gears *r* S, provided with the shield R, as set forth.

7. The receptacle D of an automatic binder, constructed with a removable section, *s*, substantially as set forth.

8. The rotary take-up case V, constructed with the hollow axial stud *u* and laterally-projecting lug *v*, combined with the cover-plate *w*, having a peripheral groove, and the tubular stud X, fitted to rotate within the hollow stud *u*, as set forth.

9. The rotating cover-plate *w*, having a peripheral groove, and a tubular axis-stud, X, combined with the rollers *y y*, mounted upon the detachable axis-plate Y, as set forth.

SYLVANUS D. LOCKE.

Witnesses:
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THOMAS P. HEWITT.