Charles W. Bowron's
Improved Grain Binder.

Patented Jan. 16, 1872.

No. 122,803.

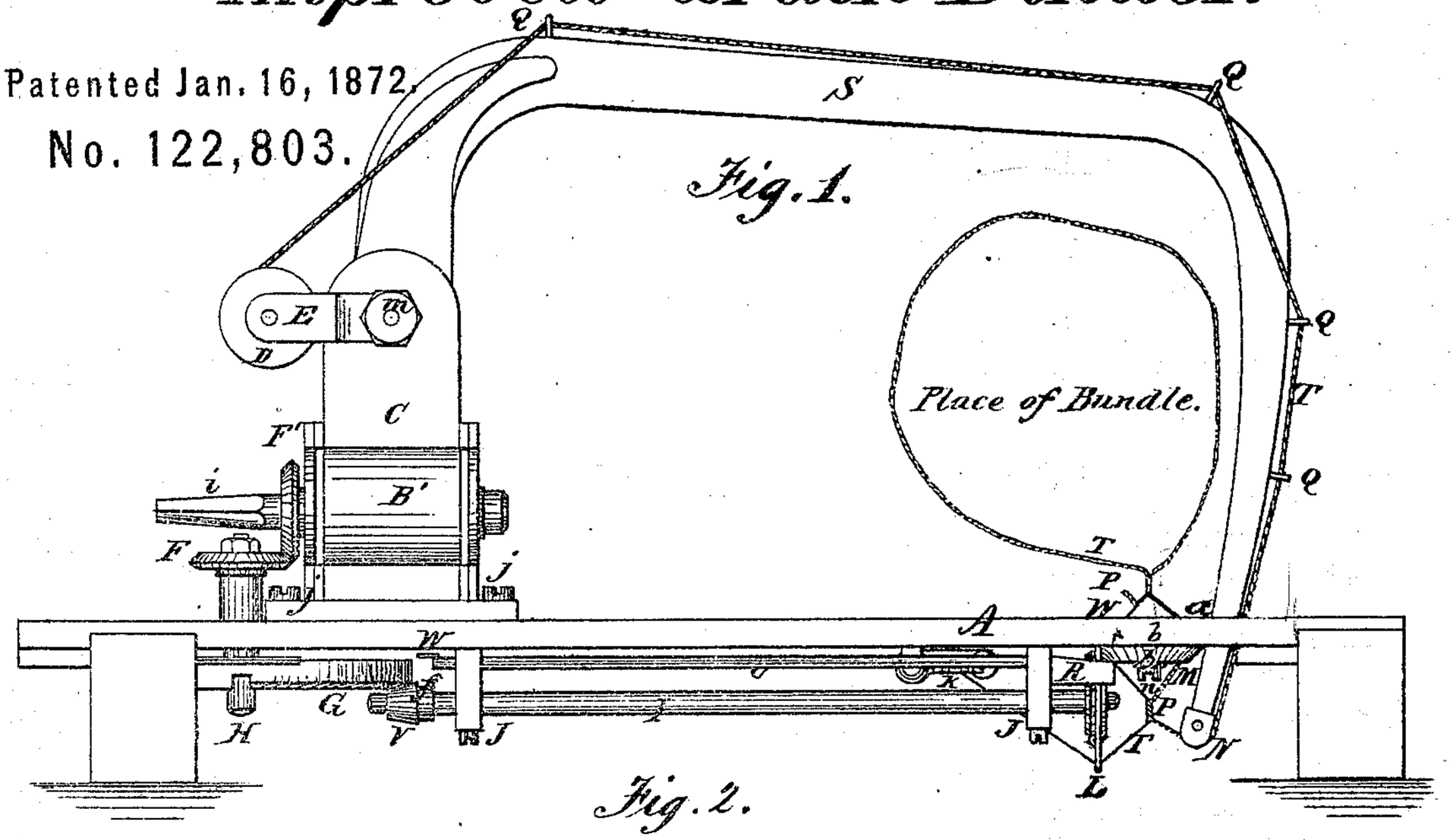


Fig. 1.

Fig. 2.

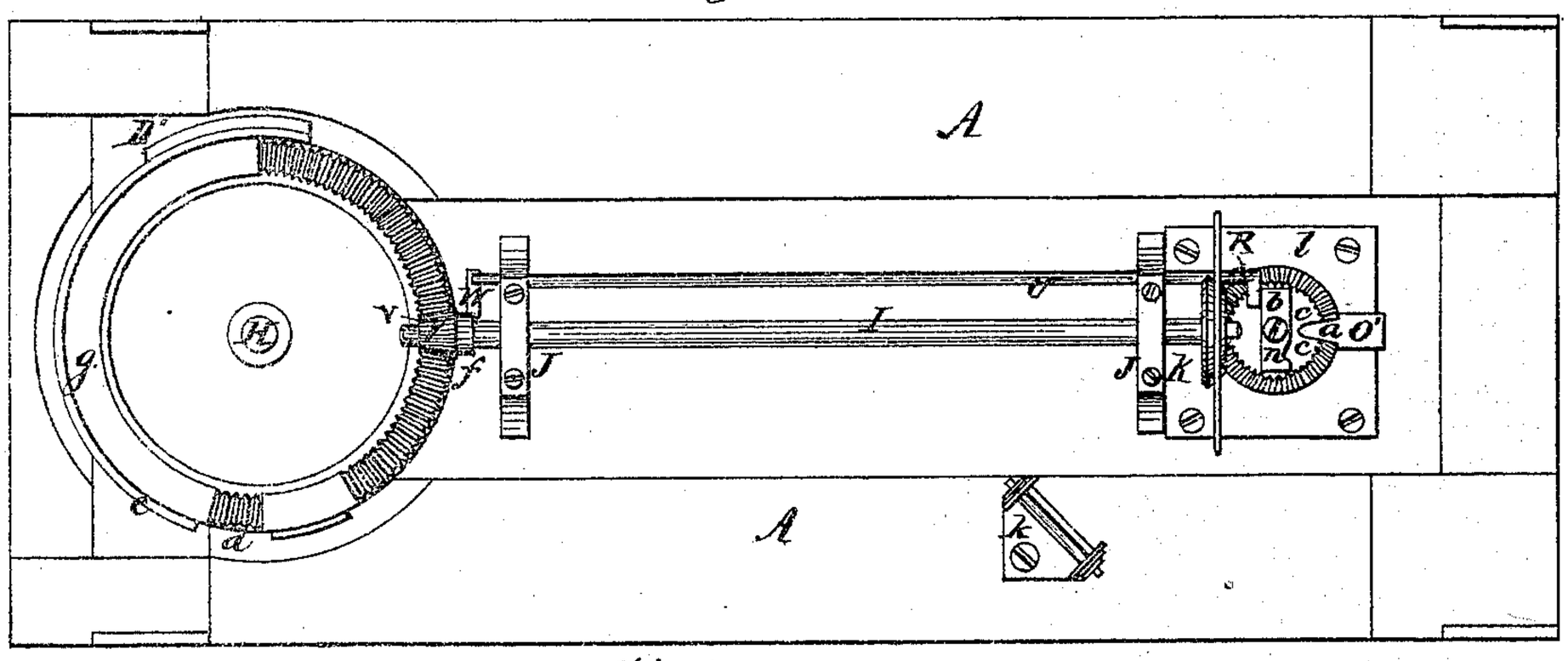


Fig. 3.

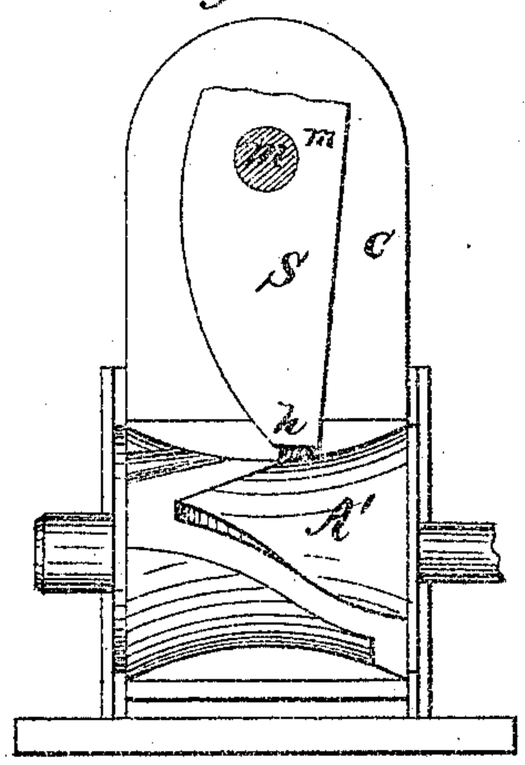


Fig. 4.

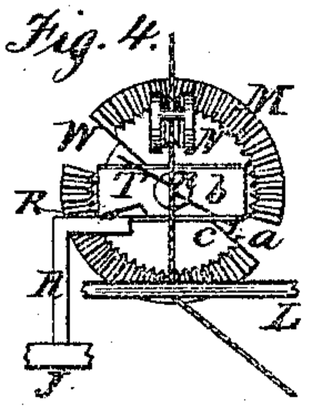


Fig. 6.

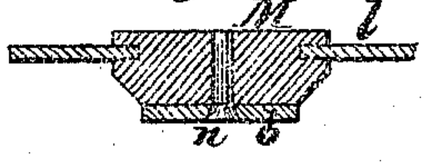
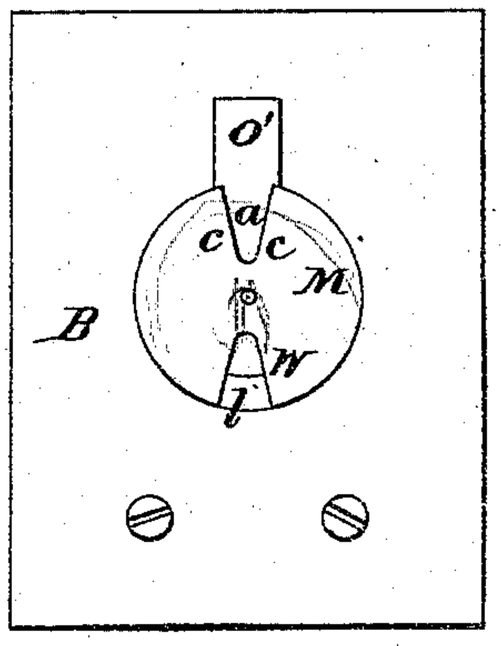


Fig. 5.



Witnesses.

G. L. Chapin.

J. L. Merians.

Inventor.

Charles W. Bowron.

122,803

UNITED STATES PATENT OFFICE.

CHARLES W. BOWRON, OF CHICAGO, ILLINOIS.

IMPROVEMENT IN GRAIN-BINDERS.

Specification forming part of Letters Patent No. 122,803, dated January 16, 1872; antedated January 1, 1872.

I, CHARLES W. BOWRON, of Chicago, in the county of Cook and State of Illinois, have invented certain Improvements in Grain-Binders, of which the following is a specification.

The nature and object of my invention consists in binding grain with twine, using wire to secure the ends of the band. Also, binding entirely without the use of a compressor, as the band is pulled tightly around the bundle by the arm in connection with the tension at the spools. The tightening of the bundle is entirely due to the tension of the band, and every bundle, large or small, has this tension brought to bear upon it. Also, the surface of the twister is in the same plane and even with the surface of the bed-plate, so that the bundle is pressed against the twister itself, and the band is thereby twisted in immediate contact to the gavel. After the bundle has been tightened by the whole amount of the tension the band, by crossing and twisting in contact with the straw, gives the gavel a final and severe tightening.

Figure 1 represents a side view of the binder, as a whole, in act of twisting. Fig. 2 represents the under or bottom view of binder and that portion beneath the platform or bed-plate. Fig. 3 represents the manner of raising and lowering the arm by means of a grooved roller or cam. Fig. 4 represents the under side of twister, and shows the cutter in act of cutting the bands. It also shows the lock holding the cutter until the notches of the twister pass it. Fig. 5 represents the opposite and upper side of twister with its surface even with the surface of the bed-plate. Fig. 6 represents a sectional view of the twisting device and cutter, showing the manner of rotating the twister by means of a plate fitting into a groove in its periphery; also, the manner of the cutter revolving at the center of the twister.

S, Fig. 1, is a curved arm used to convey the band around the bundle and hold it into the twister while being twisted. The arm S is raised and lowered by a roller fitting into the grooved cam A′, and works upon a pivot, *m*. C and B is a substantial frame-work which supports and incloses the cam A′, and in which it rotates. B′ is the cylinder part in which the cam is situated, and the upper sections C support the pivot *m* upon which arm S works. A represents the platform, and B a bed-plate of metal, or any other sufficiently-strong material, to which the various parts of the binder are attached; and A B is the plane on which the bundle is raked into the binder by any rake or device sufficient for the purpose. The frame-work C is firmly attached to the bed-plate B by the screws *j j*. G is a wheel below the bed-plate, connecting with the bevel-gear F by a shaft, H, extending through the platform. F is turned by F′ attached rigidly to cam A′. The wheel G is furnished with sections of cogs so arranged as to turn, at the proper time, the shaft I which runs to the twister, and is also furnished with sections of track or open space *e g*, upon which the shoulder *f* travels and keeps the shaft I from revolving when the twister is not in use. The wheel G, as well as the bevel F, may be dispensed with by extending the wheel F′, which is rigidly attached to cam A′, through the bed-plate and making it connect with the shaft I extended to meet it; and this extended wheel having upon its rim the same arrangement of cogs and tracks as now upon G. I is the shaft connecting the wheel G, or its substitute, with the twister M by the bevel-pinion V at one end and K at the other, and is held in place by the supports J J fastened to the bed-plate B. M is the twisting-wheel, and rotates upon the plate *l* inserted into a groove in its periphery. This twister is furnished on one side with cogs which fit into the bevel-gear K attached to shaft I. It is also furnished with two and opposite notches, *a w*, through which the ends of the band pass to be twisted. The twister is also provided with a cutter, *b*, Figs. 2, 4, which revolves upon the pivot *n* at the center of the twister. R R is a lock which operates the cutter. When the cutter is to operate this lock R R drops against it and holds it still while the twister continues to revolve and the notches passing the sharp edges of the cutter, the connection between the upper and lower twists is severed. Lock R R is operated, at the proper time, by projection D′ on wheel G striking arm W attached to shaft U running to R R. The opposite and upper side of the twister is even with and in the same plane as the surface of the platform and bed-plate, Fig. 5. This peculiar construction I

deem an important feature of my invention. *k* is the spool for holding the wire, and D the spool for holding the twine. L is a guide for the wire, and Q Q guides for the twine. N is a small pulley at the end of arm S.

Its combinations and mode of operating are as follows: When the arm is up and ready to receive a bundle the pinion V of shaft I is on the open space of wheel G at *g*. The notch *a* of the twister, at this time, is in front of opening O′, through which the end of arm S passes in carrying the upper part of the band into the twister. The wire part of the band extends from the spool *k* through the notch *a*, and just far enough above it so that it may twist together the wire and the twine carried around the bundle by the arm. From this point the twine extends to the uplifted arm. The bundle is now raked into the binder, pressing the band with it. The arm S now descends on the outside of the bundle carrying the twine around it. As the arm commences to descend the section of cogs *d* on wheel G strikes pinion V, turning the twister one-half around. By an adverse arrangement of cogs and tracks the twister may make this half-turn as the arm is ascending. The twister, in turning, carries the wire around in its notch to the opposite, leaving the other notch *w* before the opening O′ ready to receive the twine now forced into it by the further descent of the arm. The band is now around the bundle; the wire part of it extending through the back notch of twister and a small distance beyond it, and the twine extending the rest of the distance around the bundle and through the front notch of the twister. While the arm is still holding the band around the bundle lightly the larger section of cogs on wheel G strikes pinion V, turning the twister sufficiently to twist the wire and the twine together above and below the twister. While the twister was in motion the cutter *b* revolved with it, standing at right angles to the notches, Fig. 2; but, at the last turn of the twister, projection D′ strikes arm W forcing lock R R against the cutter *b*, and the cutter is held firmly until it passes the notches *a w* and is left in its former position. The wire serves two purposes, used in the manner described, first, to connect the upper and lower parts of the band by twisting with the twine below the twister; and, second, to secure the two ends of the band when around the bundle by twisting around each of them, the last twist being made above the twister. The two ends of the band may be brought so near together, by regulating the tension, as to bind almost entirely with twine, using only just enough wire to connect those ends. The band may also come from the other spool and be made entirely of wire, in which case the twist connecting the two parts of the band will come between the twister and the upper twist and be left on a waste end of the wire, thereby making only one twist in that wire passing around the bundle.

It is only necessary, in using this machine, to observe that wire shall twist with wire or wire with twine.

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

1. I claim the combination of one wire and one twine, in the manner described and herein set forth, for the purpose of binding grain.

2. I claim the combination of the bed-plate and the twister, constructed and operating substantially as and for the purpose herein set forth.

3. In combination with the above, I claim the arm S, substantially constructed and operating as set forth.

4. I claim the wheel G or its equivalent, in combination with shaft I and its pinions V and *k*, twister M, lock R R, and cutter *b*, all these parts being constructed and operating substantially as and for the purpose set forth.

CHARLES W. BOWRON.

Witnesses:

BISHOP REIMER,

FRANKLIN S. COWAN. (74)