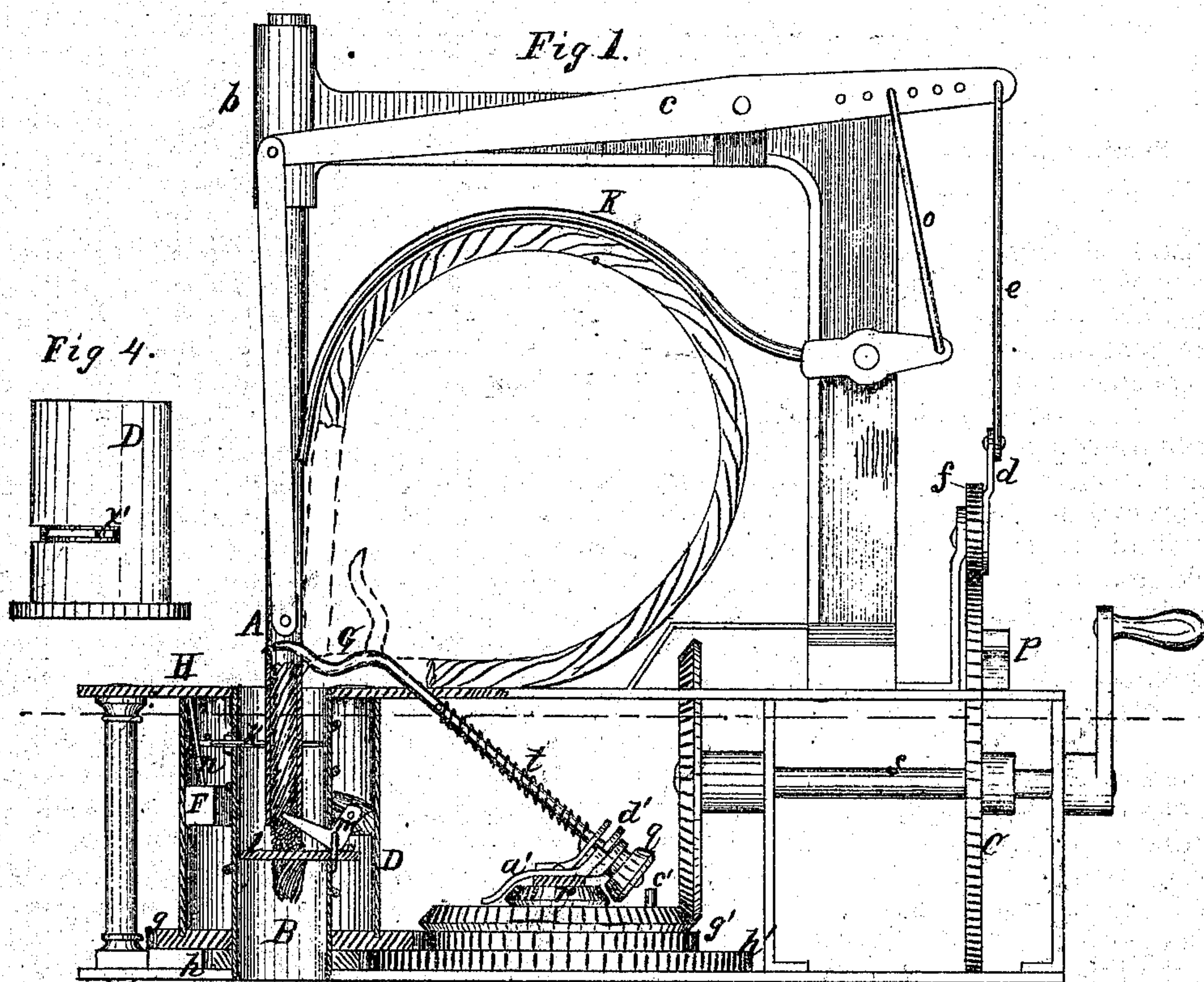


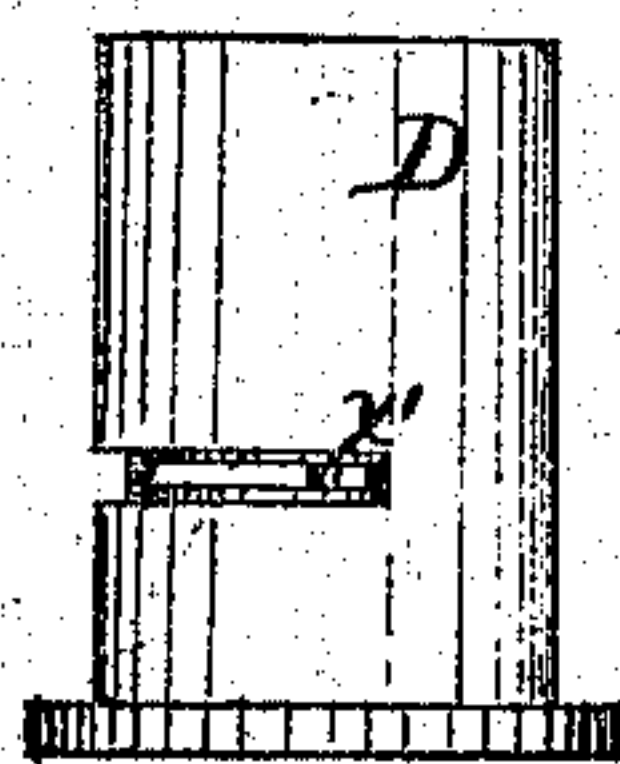
*G. A. Scribner,*  
*Grain Binder.*

*No. 107823.*

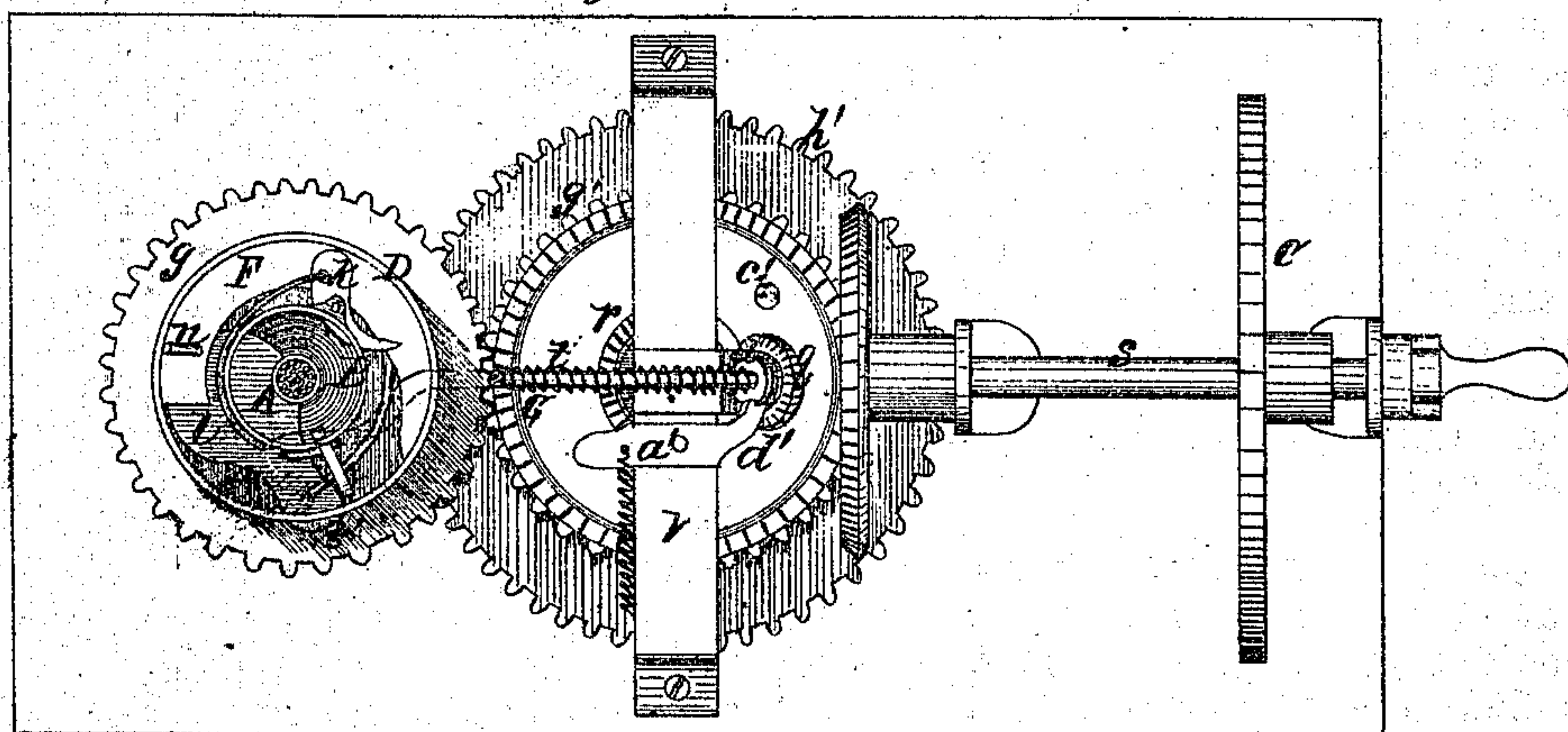
*Patented, Sep. 27. 1870*



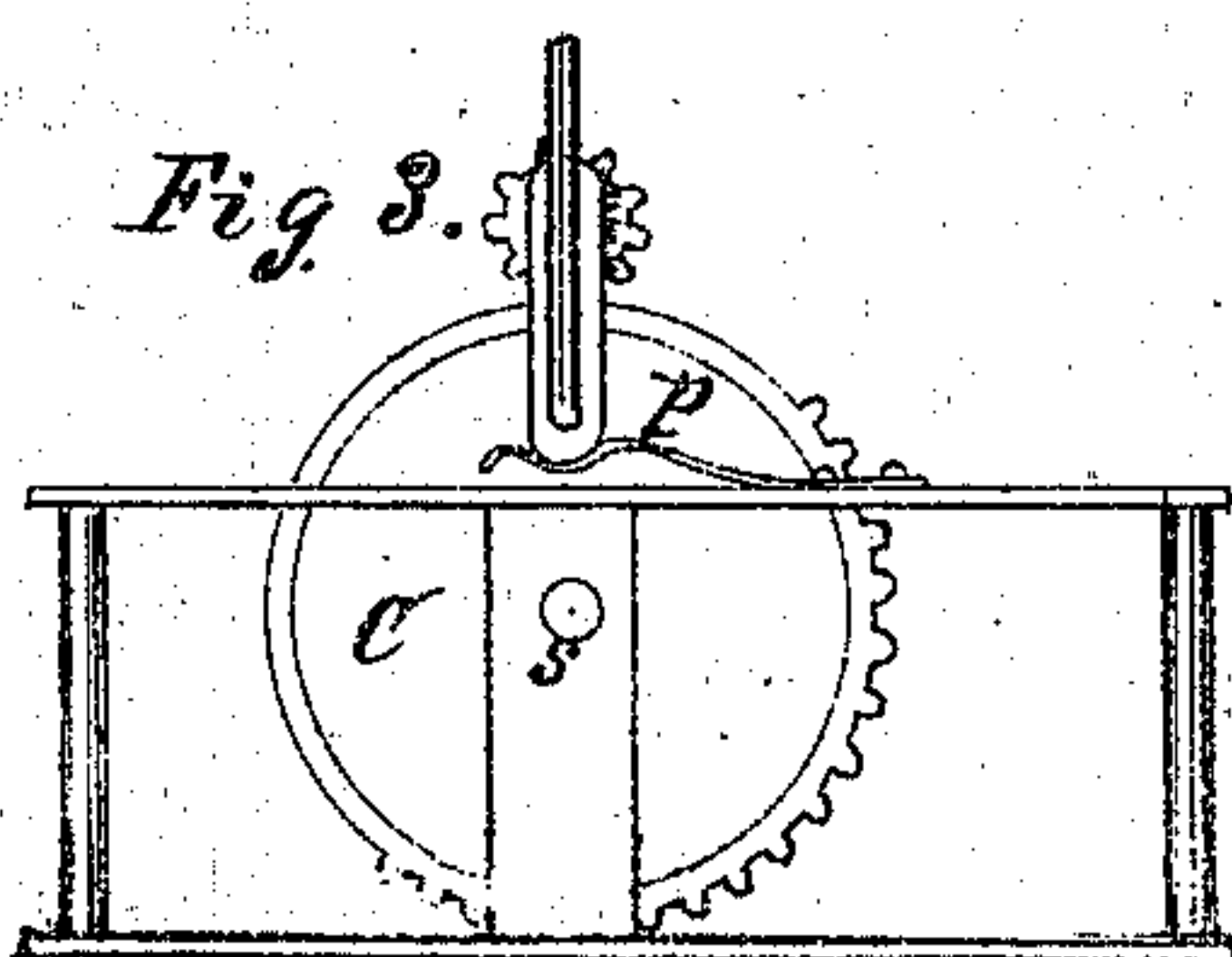
*Fig 4.*



*Fig 2.*



*Fig 3.*



*Witnesses:*

*J. H. Clement*  
*Geo. F. Parker*

*Inventor:*

*Gilman A. Scribner*



# UNITED STATES PATENT OFFICE.

GILMAN A. SCRIBNER, OF ROCHESTER, NEW YORK.

## IMPROVEMENT IN GRAIN-BINDERS.

Specification forming part of Letters Patent No. 107,823, dated September 27, 1870.

I, GILMAN A. SCRIBNER, of Rochester, in the county of Monroe and State of New York, have invented certain Improvements in "Machines for Binding Grain," of which the following is a specification:

My invention relates to a combination of devices for binding grain with a continuous straw band; and consists, chiefly, in the employment of a reciprocating band-carrier, in connection with a cylindrical twisting device and a suitable tucking-arm.

In the drawing, Figure 1 is a sectional side elevation of my invention. Fig. 2 is a plan view below the dotted line *x*, Fig. 1. Fig. 3 is an end elevation of a portion of the apparatus.

The band-carrier *A* is made hollow, so as to act as a shield for the band, and it is reciprocated either in a guide, *b*, or upon the end of a swinging arm, so as to enter the twisting-cylinder *B* centrally, or nearly so. This band-carrier is operated by the crank *d* and gear *f*, through the link *e* and lever *c*, which, in turn, are put in motion by the segmental gear *C* on the drive-shaft *s*. The twisting device consists of two cylinders, *B* and *D*, one within the other, to each of which a gear, *g h*, is attached at any convenient point. The cylinders *B D* are so located as to be flush with the surface of the table *H*, or slightly below it, and one or both is provided with bearings in the bottom and top plates of the machine. The cylinders are driven by intermediate gears *g' h'*, which are also put in motion by the drive-shaft *s*, through suitable bevel-gears or other equivalent means. It is necessary that the gears *g h g' h'* be so proportioned that the speed of the inner cylinder shall be greater than that of the outer one by at least one revolution during the time occupied in binding a bundle. The cylinder *B* is provided with clamps *l* and *m*, by which the ends of the band are held during the process of twisting, and a knife, *k*, for cutting off the latter after being clamped. The clamp *l* works upon a pivot in a horizontal slot in *B*, and its shank *t'* projects outward, so as to come in contact with the inner periphery of the cylinder *D*, by which contact the clamp is forced to compress the end of the band against the side of *B*, as indicated in Fig. 1, except at a certain point, where a slot, *x'*, Fig. 4, is cut through *D*, and the shank

*t'* made to drop into it by the pressure of a spring, thus releasing the band at that point. The clamp *m* is pivoted, so as to work vertically, or nearly so, in a slot formed in *B*, and is retained in its upward position by a spring applied in any convenient manner. An annular cam, *F*, is secured to the interior of the cylinder *D*, against which the bent arm of the clamp *m* bears during a certain portion of the time required to bind a bundle. The knife *k* is pivoted, so as to pass through a horizontal slot in the cylinder *B*, and is held in its outward position by a suitable spring. A stop or cam, *n*, is so located within the cylinder *D* as to force the blade of the knife across the inner cylinder, thus severing the band.

It will be observed that, since the motion of the inner cylinder is quicker than that of the outer one, the clamps *l* and *m* and knife *k* will be operated as often as *B* gains a revolution upon *D*. The object of this arrangement is to admit of the ends of the band being given several twists, since, if the cylinder *D* were stationary, the clamps and knife would be operated at each revolution of *B*.

The gear *C* is so proportioned that two revolutions are given to the pinion *f* by the toothed portion of the former, while the crank *d* is held in the position in which it is left during the remainder of the revolution of *C*, by means of the spring *p*, Figs. 1 and 3, or other suitable stop, a recess in which catches and retains the end of the crank.

For the purpose of tucking the ends of the band into the bundle, I provide the bent arm *G*, around which a spring, *t*, is arranged to return it to its upward position. The pinion *q* is attached to the extremity of *G*, and meshes into the segmental gear *r*, secured to the intermediate gears *g' h'*. The arm *G* is provided with suitable bearings on the frame of the machine, and has also a single-toothed ratchet, *d'*, in which the pivoted spring-pawl *a'* engages. The pin *c'*, secured at the proper point upon the intermediate gear *g'*, comes in contact with the outer end of pawl *a'*, thus releasing the tucker to the action of the spring *t*. The compressor *K* is pivoted at a convenient point upon the frame of the machine, and is forced down simultaneously with the band-carrier by means of the connecting-link *o*. The object of this is to compress the bundle lying upon



the platform H when the band is being passed around it.

The operation of my invention is as follows: The band, which has been previously prepared by twisting it from straw or other similar material, and wound upon a reel for use, is passed through the carrier A, and allowed to project somewhat from the lower end. When the shaft *s* is revolved, the carrier descends by the action of the crank *d* and connections, and, when at the lower end of its stroke, the end of band is caught by the clamp *l*, the cylinders B and D being so timed and arranged with respect to each other and the band-carrier that, by means of the quicker motion of B, the shank *t'* is forced past the slot *x'* in D, and the clamp thus pressed against the side of B at the proper time. While, however, the shaft *s* is making a partial revolution, the band-carrier descends twice by means of the small gear *f*, and between such descents the grain is raked upon the platform against the band by any suitable raking device. Consequently, by the second descent of A, the band is passed around the bundle, and, as the former reaches the extremity of its second stroke, the jaw *m* is folded down upon the band against the plate *l* by means of the cam F. When A begins to rise, the knife *k* is forced across the cylinder B by its shank coming in contact with the stop *n*, and the band thus severed. The twisting-cylinders now make two or more revolutions, according to the proportions of the gears *g h g' h'*, the ends of the band being firmly twisted together. At this juncture the cylinder B has gained a revolution upon D, and the clamp *l* is released by its shank dropping through the slot *x'*, and also the jaw *m*, by its bent arm,

leaving the cam F, while at the same instant the pawl *a'* is tripped by the pin *c'*, and the tucker G forced to push the ends of the band into the bundle by means of the spring *t*. The sheaf is then removed from the machine by any suitable device.

The compressor K is adjustable to heavy and light grain, by placing the end of the link *o* in any of the holes shown in the lever *c*.

It may be desirable to provide a spring or other device to check the paying out of the band through the carrier A, so as to regulate the tension around the bundle.

Instead of the pinion *f* and gear C, it would be practicable to substitute a cam on the face of the disk C, so formed as to communicate the proper motions to the carrier A.

What I claim as my invention is—

1. A band-twister, composed of the cylinders B and D, constructed and arranged to operate substantially as described.

2. The revolving cylinder B, provided with clamps *l* and *m*, for holding the ends of the band, and a knife for severing the same, all the parts being constructed to operate substantially as and for the purposes set forth.

3. The segmental gear C and pinion *f*, in combination with the reciprocating band-carrier A, when arranged to operate conjointly with the twisting-cylinders B and D, for the purposes set forth.

4. The hollow reciprocating band-carrier A, in combination with the twisting-cylinders B and D, operating substantially as set forth.

GILMAN A. SCRIBNER.

Witnesses:

F. H. CLEMENTS,  
GEO. T. PARKER.