4 Sheets—Sheet 1.

A. B. SMITH.

Grain Separator.

No. 85,141. Patented Dec. 22, 1868.

Fig. 1.

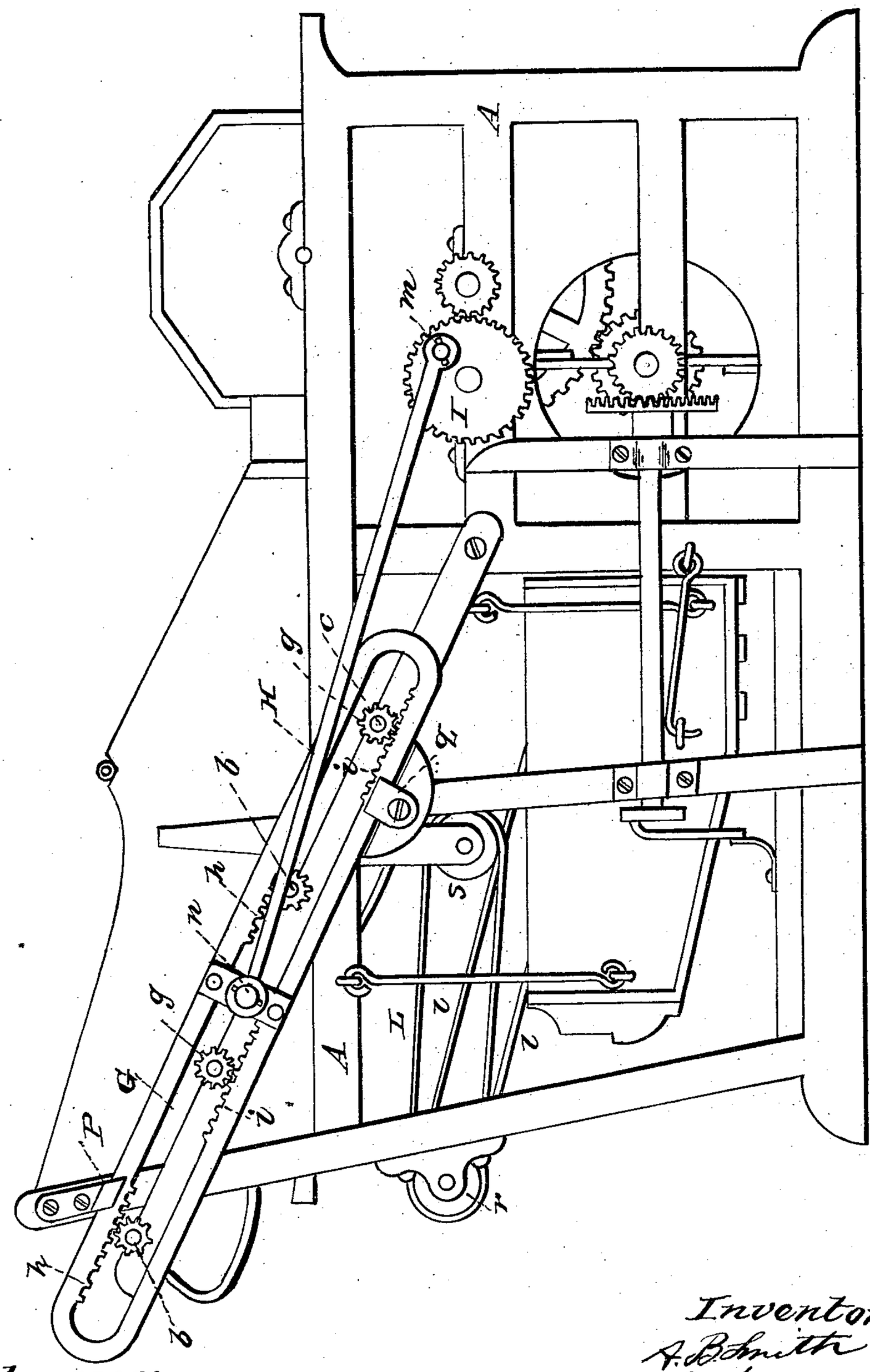

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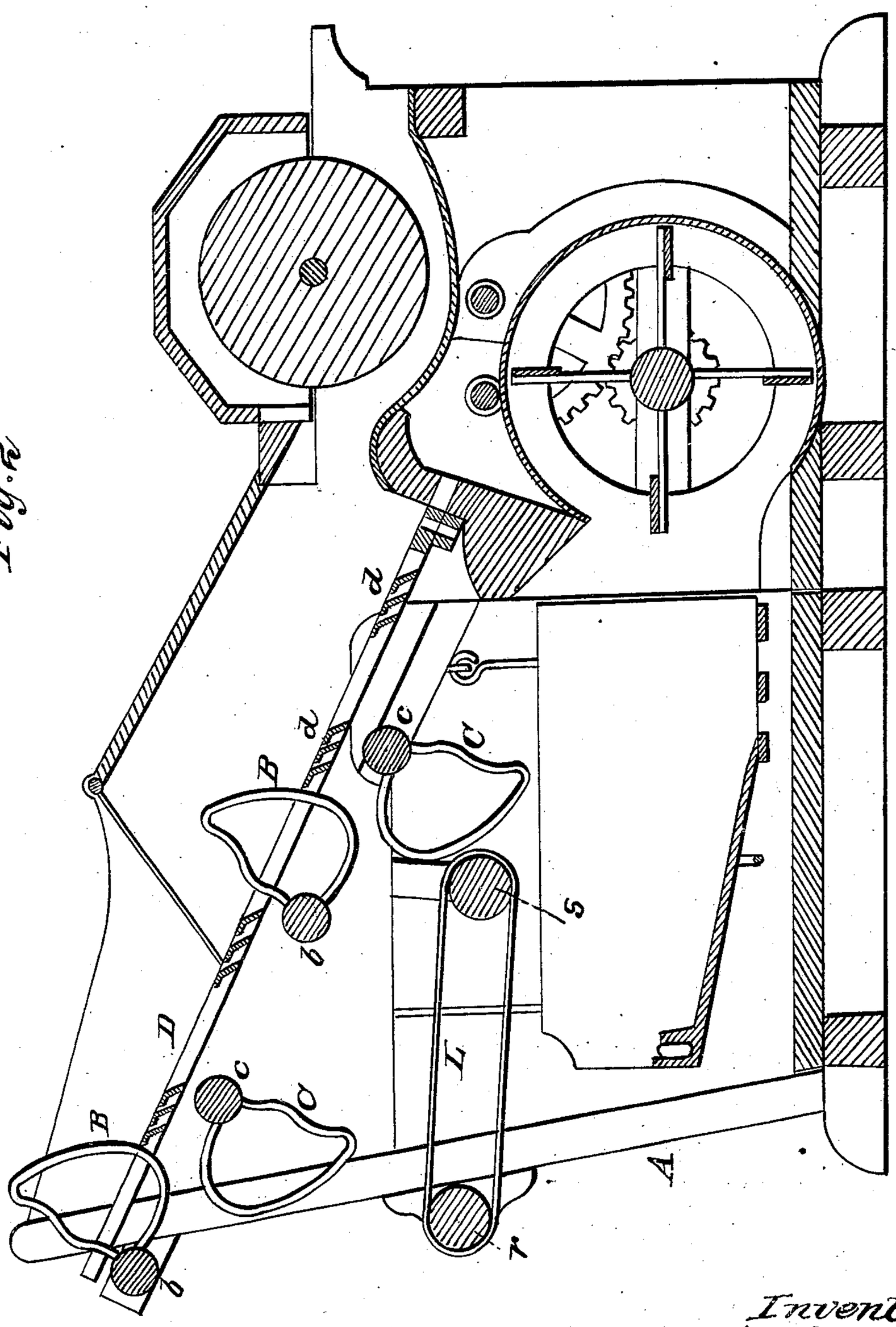
Fig. 2



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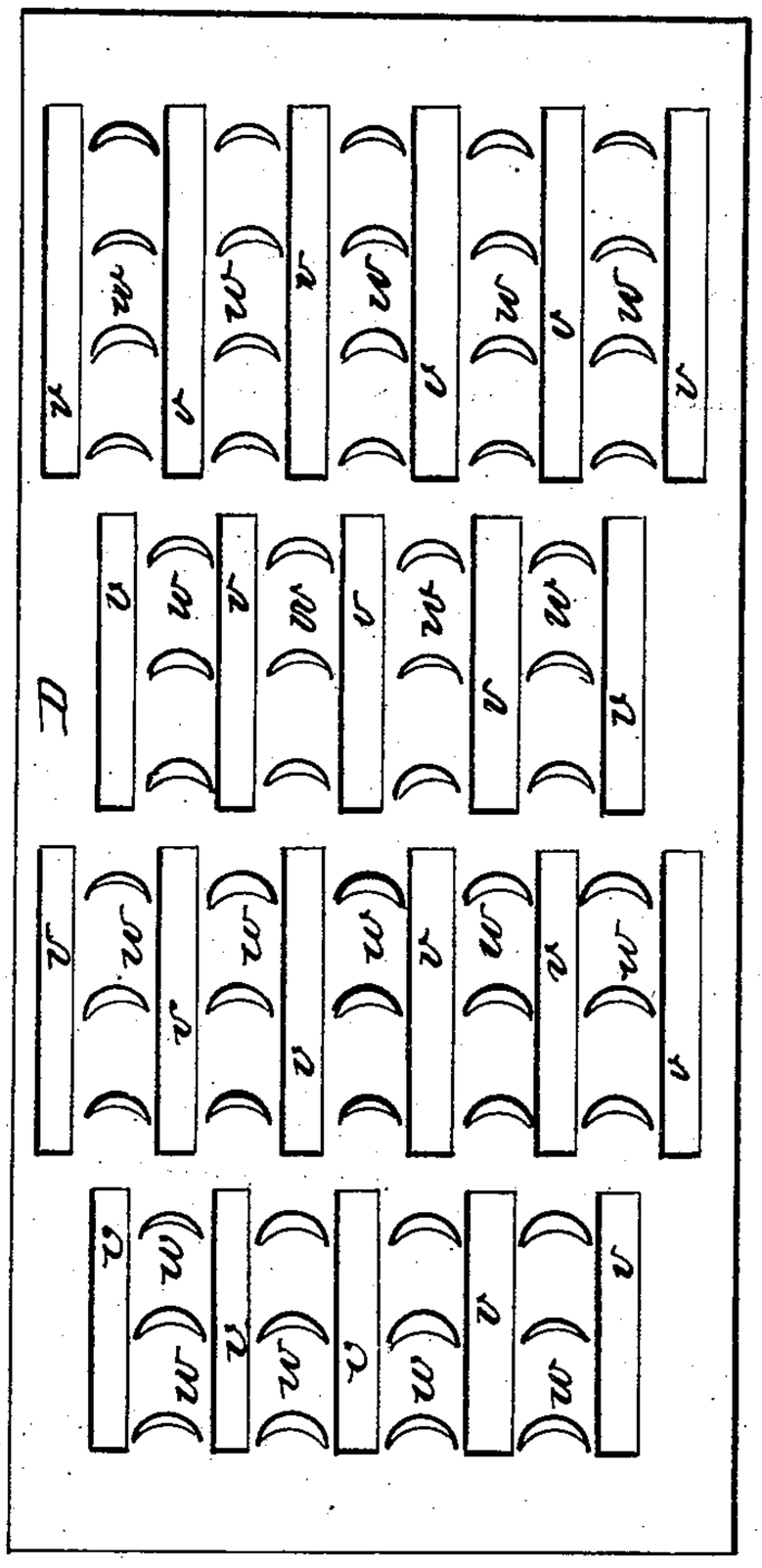

Fig. 4.

Fig. 3.

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No. 85,141. Patented Dec. 22, 1868.

Fig. 6

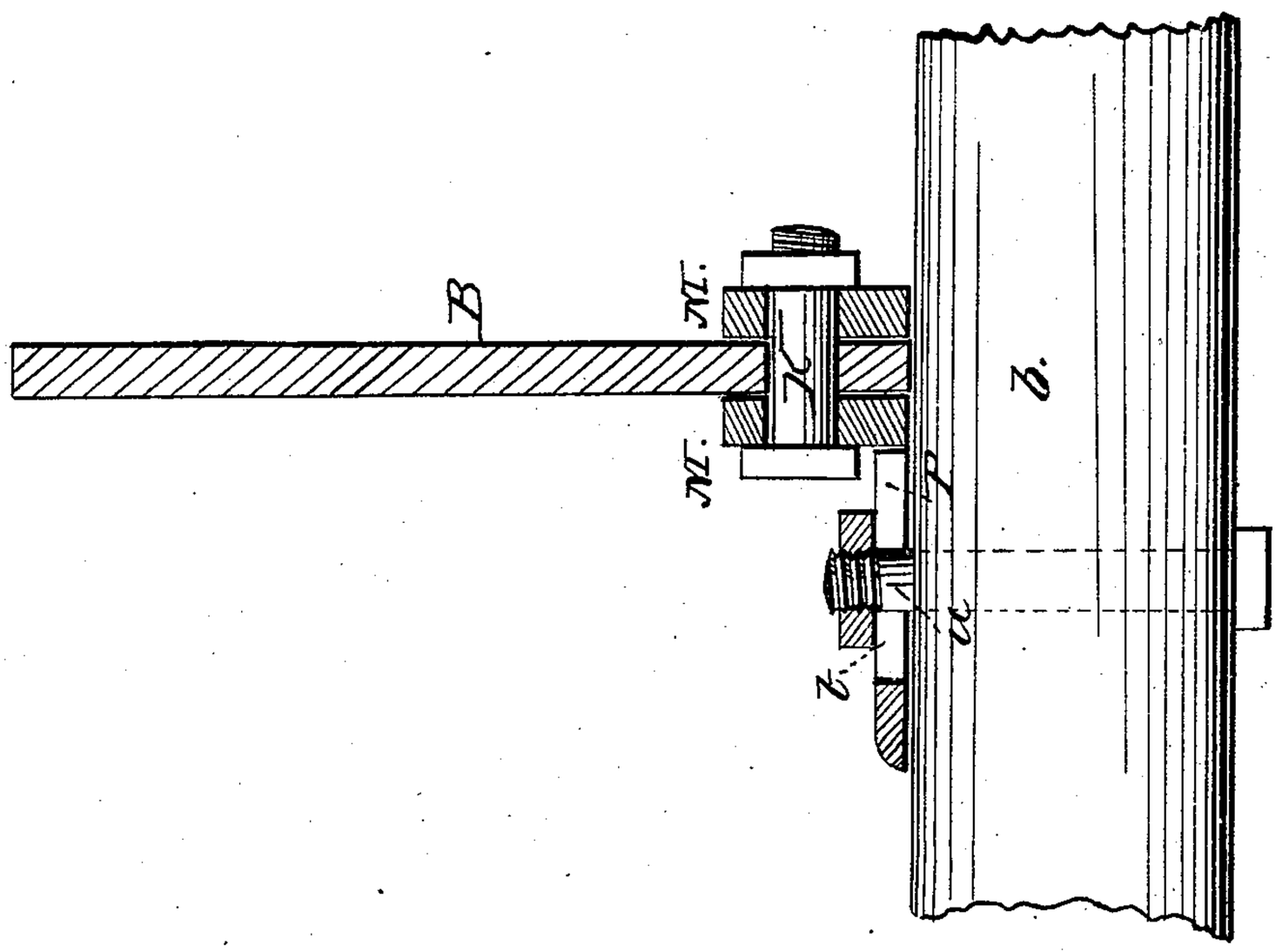
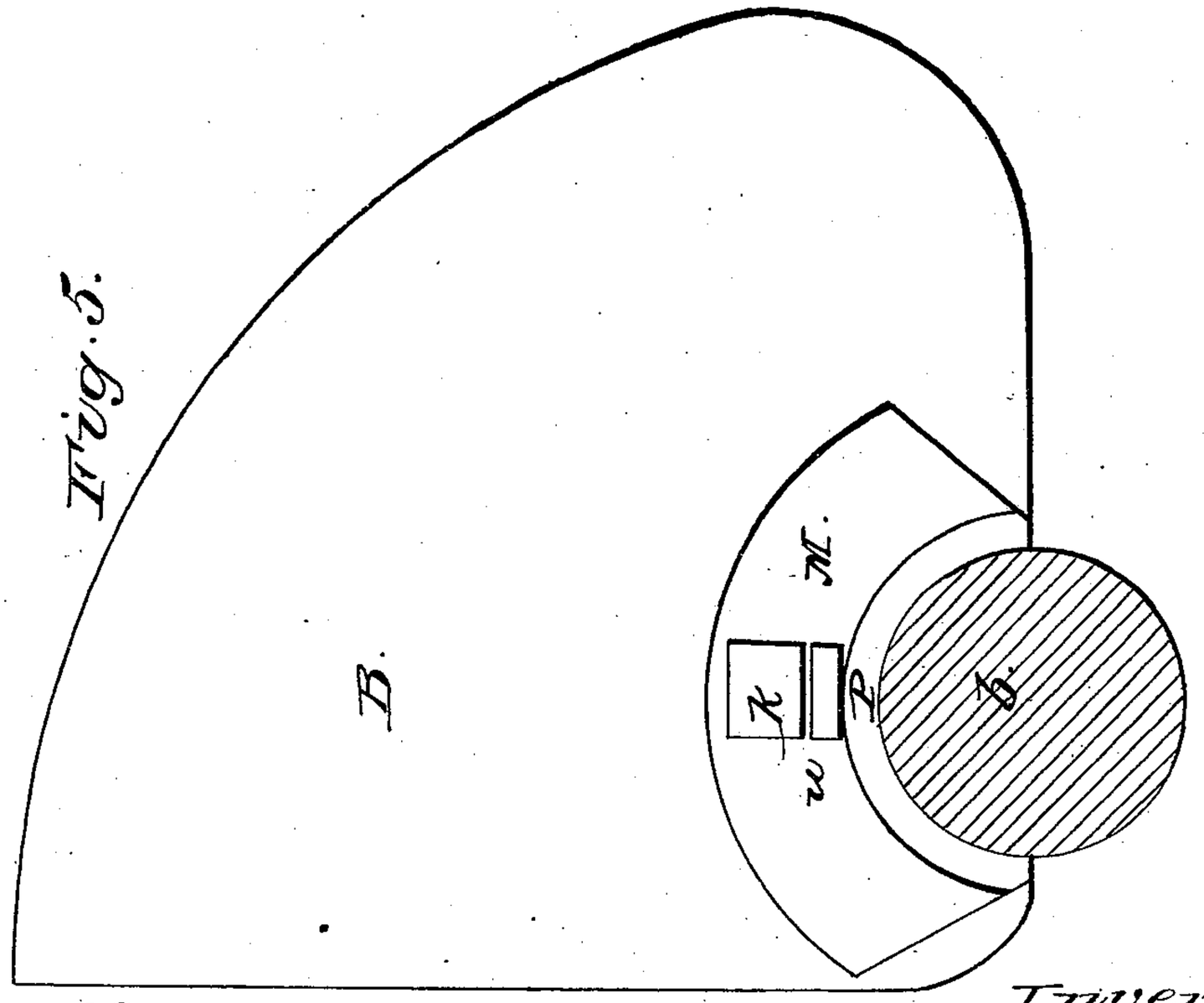


Fig. 5.



Witnesses

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Letters Patent No. 85,141, *dated December* 22, 1868; *antedated December* 5, 1868.

IMPROVEMENT IN GRAIN-SEPARATOR.

The Schedule referred to in these Letters Patent and making part of the same.

To all whom it may concern:

Be it known that I, A. B. SMITH, of Rochester, in the county of Beaver, and State of Pennsylvania, have invented an Improved Grain-Separator; and I do hereby declare that the following is a full and exact description thereof, reference being had to the accompanying drawings, making part of this specification—

Figure 1 being a side elevation of the machine.

Figure 2, a longitudinal vertical section thereof.

Figure 3, a cross-section of the slatted apron.

Figure 4, a top view of a modified construction of the apron.

Figures 5 and 6, detached views, full size, of one of the knockers detached, showing my improved construction thereof, and mode of attachment and adjustment on its shaft.

Like letters designate corresponding parts in all of the figures.

Let A represent the frame of a thresher and grain-separator provided with my improvements.

The main feature of my invention consists in the employment of a series of knockers, B B and C C, reciprocating a half circle between the slats of a stationary inclined apron, D, for the purpose of conveying away the straw, and thoroughly shaking it in the act, for separating the grain therefrom.

The apron D is made of a set of inclined parallel slats, extending upward and backward from the threshing-cylinder, with spaces between them wide enough to allow the grain to fall through, and to admit the passage of the knockers upward therein. The slats are thicker at the top than at the bottom, as shown in fig. 3, so that no grain-heads, chaff, or other obstruction may lodge between them. Also, there are inclined guard-strips of metal, *d d*, inserted across the spaces between the slats, substantially as represented, wherever they can be inserted without closing the way for the passage of the knockers, so as to prevent straws and heads from working down between the slats and falling on the riddles, or sieves, below. These strips of metal are secured in saw-kerfs made in the edges of the slats, and are at such a distance apart as to allow the grain to freely pass down between them, and no more.

Fig. 4 represents a modified construction of the apron, consisting of a metallic plate, with slots *e e* therein, alternating in position, for the reception of the knockers, and crescent or equivalent-shaped apertures *w w* for the passage of the grain down through the plate.

The knockers are divided into two sets, B B and C C. Each set, on separate shafts *b b* and *c c*, alternate in position and in action, that is, one set, B B, going up as the other set, C C, goes down. They reciprocate on their shafts a half circle, or thereabouts; at the upward termination of the strokes, being in the position shown by the knockers B B, fig. 2. The upward reciprocating movement moves the straw upward and backward on the apron, and at the same time lifts it, so as to thoroughly shake it. The downward movement eases the knockers away from the straw, without any tendency to draw it down through the apron.

The shafts of the knockers are located beneath the apron, and this position and reciprocating movement of the knockers are the only ones that will effectually serve the purpose intended.

A continuous revolving movement of the straw-drivers, as heretofore in use, cannot operate successfully, their great defect being their necessary tendency to carry the grain down through the apron.

In figs. 1 and 2, the knockers are represented as made of wire; but I prefer to make them and attach them to their shafts as represented in figs. 5 and 6. Here they are formed of wood, in quadrantal form, or nearly so. They are clamped between metallic jaws M N and held by a bolt, *k*. One of the jaws, as M, has a flanch, P, of cylindro-concave form, so as to fit the surface of the shaft *b*, to which it is fastened by a bolt and nut, *u*. The bolt passes through an oblong hole or slot, *t*, in the flanch, so that the knocker can be adjusted lengthwise of the shaft, and be accurately located between the slats of the apron.

The alternate reciprocating movements of the two sets of knockers, B B and C C, are produced in an accurate and simple manner by means of pinions *f f* and *g g*, secured respectively on their shafts *b b* and *c c*, and gearing respectively into racks *h h* and *i i*, which alternate in position on opposite sides of a slotted reciprocating rack-bar, G, substantially as represented in fig. 1. It is evident that in whichever direction the rack-bar moves, the racks *h h* will drive the shafts *b b* in the direction opposite to the motion produced on the shafts *c c*, driven by the opposite racks *i i*.

The rack-bar is reciprocated by a crank-wheel, I, and connecting-rod H, pivoted, at *m* and *n* respectively to the crank-wheel and rack-bar. Any equivalent means of producing the movement may be adopted.

The rack-bar is retained and directed in guides *f g*.

Another feature of my improvement consists in the employment of a continuously-moving endless apron, L, instead of a chute-board beneath the separator-apron D, for the grain to drop on. This insures the regular conveyance of the grain to the sieves, and it never becomes obstructed. It passes around rollers *r s*, one of which is driven by a band, *l*, connecting it with a driving-pulley in any convenient position.

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

The reciprocating knockers B B and C C, arranged and operating in combination with the stationary slatted or slotted apron D, substantially as and for the purpose herein specified.

Also, constructing the knockers of wooden quadrants, held between metallic jaws M N by bolts, substantially as specified.

Also, attaching the knockers by the flanch-plate P, with its slot *t* and bolt *u*, so as to be adjustable on their shaft, substantially as set forth.

Also, the inclined guard-strips *d d* between the slats of the apron D, in combination with the knockers B B, C C, for the purpose specified.

The above specification of my improved grain-separator signed by me, this 10th day of January, 1866.

A. B. SMITH.

Witnesses:

J. S. BROWN.

A. S. VAN VRANKEN.