

H. F. SHAW & G. F. SHAW.  
Friction Gear for Harvesters.

No. 133,675.

Patented Dec. 3, 1872.

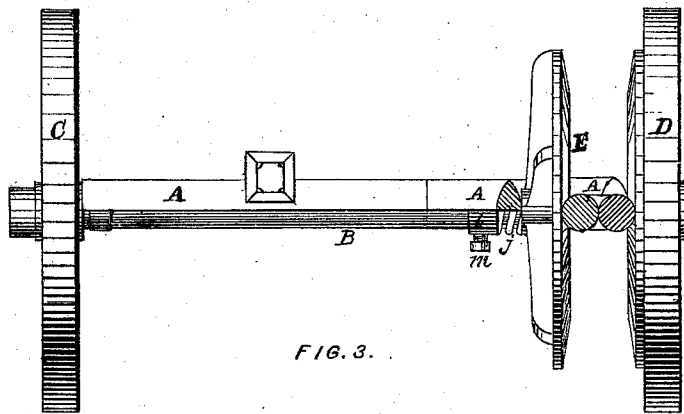


FIG. 3.

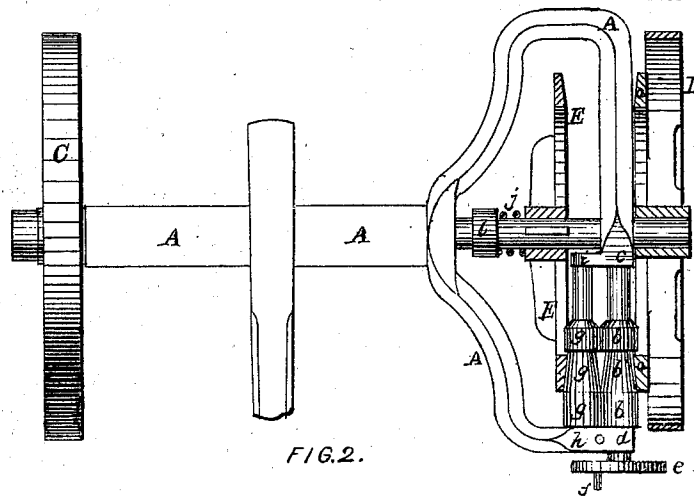


FIG. 2.

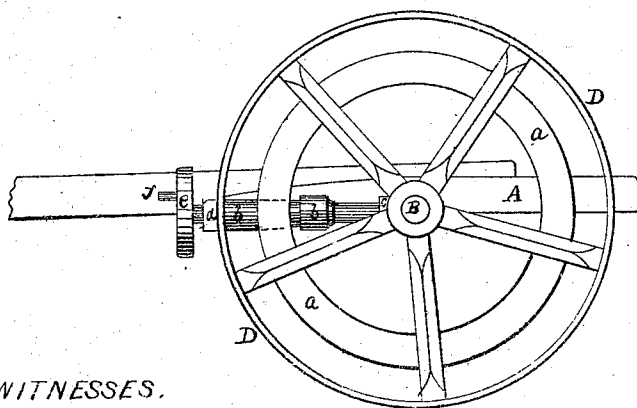


FIG. 1.

WITNESSES.

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# UNITED STATES PATENT OFFICE.

HENRY F. SHAW AND GEORGE F. SHAW, OF WEST ROXBURY, MASS.

## IMPROVEMENT IN FRICTION-GEARS FOR HARVESTERS.

Specification forming part of Letters Patent No. 133,675, dated December 3, 1872.

*To all whom it may concern:*

Be it known that we, HENRY F. SHAW and GEORGE F. SHAW, both of West Roxbury, in the county of Norfolk and State of Massachusetts, have invented a new and useful Improvement in Friction-Gear for Harvesters, Mowing-Machines, and for other purposes, of which the following is a specification:

The object of our invention is the production of a gearing for driving the cutter-bar of harvesters, mowing-machines, and for various other purposes, that may be run at a high rate of speed without the noise that is so objectionable in the machines now in use, which are driven by toothed gearing; to cheapen the construction as compared with spur-gearing, and at the same time obviate the objectionable features of the friction-gearing that has been heretofore used for the purpose, viz., the great pressure upon the journals of the friction-rolls, which has always been a source of trouble when but one friction-roll was used with one driving-surface, invariably resulting in the failure of the device; and also the grinding action incident to running two conical rolls in contact with each other, and two driving-surfaces when the axis of one of said rolls is at right angles to the axis of the driving-shaft; and it consists in the employment of two friction-rolls placed side by side, with their axes parallel to each other, a portion of their length at either end being made cylindrical and of equal diameter, and so mounted in suitable bearing in the frame that the outer surfaces of their cylindrical portions shall be in contact, while another portion of said rolls is made conical to correspond to the surface of a flat conical ring formed on the driving-wheel, which is secured rigidly to the axle, and also to a correspondingly beveled or conical ring, forming the rim of a wheel, which is fitted to the axle in such a manner that while it is compelled to revolve therewith it is free to move endwise on said shaft, a spring being used to press said wheel hard against the friction-roll, said spring being so applied that its tension may be increased or diminished at pleasure, said wheels being a distance apart equal to the sum of the diameters of the friction-rolls, and one of said rolls carrying the crank which drives the cutter-bar.

Figure 1 of the drawing is an end elevation

of so much of a mowing-machine as is necessary to illustrate our invention; Fig. 2 is a sectional plan; and Fig. 3 is a front elevation of the same with a portion of the frame and the friction-rolls shown in section.

A is the frame, mounted upon the axle B, upon one end of which is also mounted the wheel C, so fitted thereto that it may revolve freely thereon, while upon the other end of said axle is fitted and rigidly secured thereto the driving-wheel D. The wheel D is provided with a conical ring, *a*, concentric with the axis of the wheel and upon its inner face, said ring being turned true, and to fit the conical part *b'* of the friction-roll *b*. The roll *b* is mounted in bearings *c* and *d* in the frame A in a position at right angles to the axis of the wheels C D, and has mounted upon its outer end the disk *e*, carrying the crank-pin *f*, to which one end of the pitman which drives the cutter-bar is connected. Another friction-roll, *g*, is mounted, in bearings *h* and *i* in the frame A, parallel to and in the same horizontal plane with the roll *b*, the front end of which does not project through or beyond the bearing *h*. A portion of the middle of each of the rolls *b* and *g* is made tapering or conical, as shown at *b'* and *g'*, while a portion of the length of each upon either side of said conical portion is made cylindrical and of equal diameter, said cylindrical portions rolling in contact with each other. E is a wheel having a rim of the same diameter as the ring *a* on the wheel D, and of the same conical form, said wheel E being fitted to the axle B by means of a spline and key in such a manner that it must revolve with the axle B, while at the same time it is free to move endwise thereon, the conical face of the rim of said wheel being toward the driving-wheel D, and in contact with the conical part of friction-roll *g*, against which it is forced by the spring *j*, the tension of which may be varied at pleasure by moving the collar *l* upon the axle B, and securing it in position by the set-screw *m* in an obvious manner. The bearings for the journals of the friction-rolls *b* and *g* are made slightly oblong in a horizontal direction to allow said rolls to accommodate themselves to the pressure applied thereto without subjecting their journals to a pressure which would be likely to cause them to heat and wear badly.

By the above-described arrangement of two friction-wheels mounted upon the axle or driving-shaft, with their friction faces toward each other, and two friction-rolls interposed between the same with their axes parallel to each other, and provided with cylindrical surfaces at either end thereof, while the center portion of each is made conical, as shown, one of which rolls is in contact with and is driven by each of the cylindrical portions of said friction-wheels while the opposite sides of said rolls are in contact, all strain and friction are removed from the journals of said rolls, and a very smooth and still-running gear is obtained that can be run at almost any desired speed without undue strain or wear upon the journals, and without grinding action upon the friction-rolls or the driving-surfaces, a perfect rolling contact being the result.

Other advantages of the employment of our improved gear are less cost and a greater length of pitman, which may be obtained by having the crank so near the driving-wheel.

What we claim as new, and desire to secure by Letters Patent of the United States, is—

1. The friction-rolls *b* and *g* provided with

conical surfaces *b'* and *g'*, and having cylindrical bearing-surfaces at each end thereof, and arranged parallel to each other, in combination with two frictional driving-surfaces, *D* and *E*, one of which acts upon the roll *b* and the other upon the roll *g*, substantially as described.

2. In combination with the axle *B* and carrying-wheels *C* and *D* of a harvester, we claim the friction-rolls *b* and *g*, provided with conical surfaces *b'* and *g'*, and having cylindrical bearing-surfaces at each end thereof, the adjustable pressure-wheel *E* mounted upon said axle in such a manner that it is free to slide thereon in the direction of its length, and the spring *j* for controlling said pressure-wheel, all arranged and operating substantially as described, for the purposes specified.

Executed at Boston this 24th day of June, 1872.

HENRY F. SHAW.  
GEORGE F. SHAW.

Witnesses:

N. C. LOMBARD,  
S. A. WOOD.