2 Sheets—Sheet 1.

R. CAMPBELL.
Harvester.

No. 208,461. **Patented Oct. 1, 1878.**

Fig. 1.

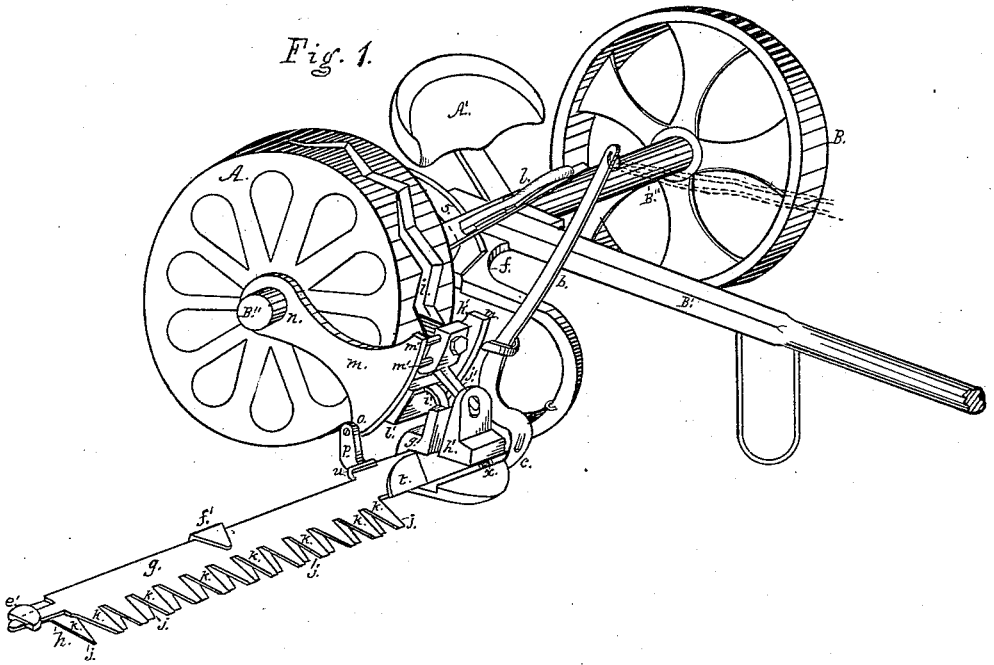
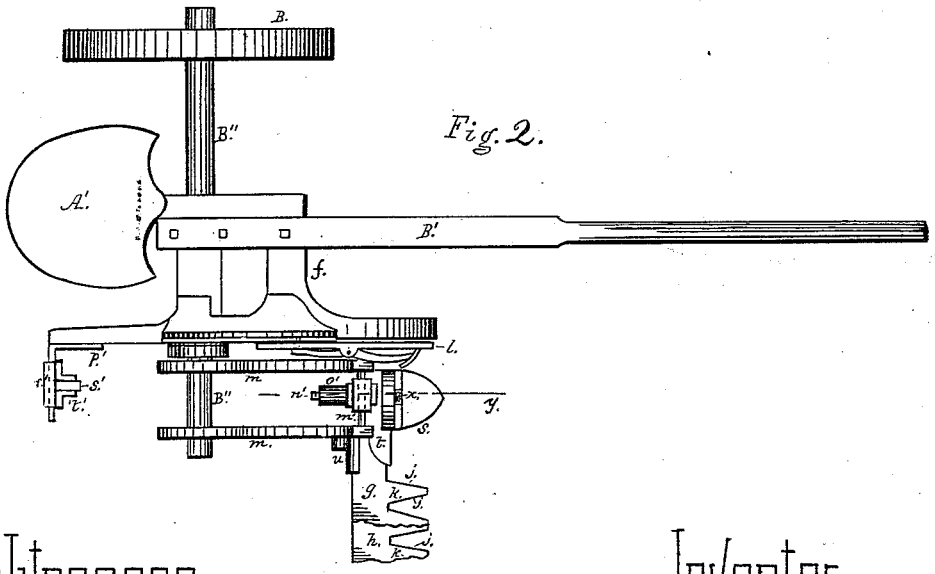


Fig. 2.



Witnesses

James I. Johnston

A. E. Johnston

Inventor

Robert Campbell

By Johnston & Donn

his attorneys.

R. CAMPBELL.
Harvester.

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Fig. 3.

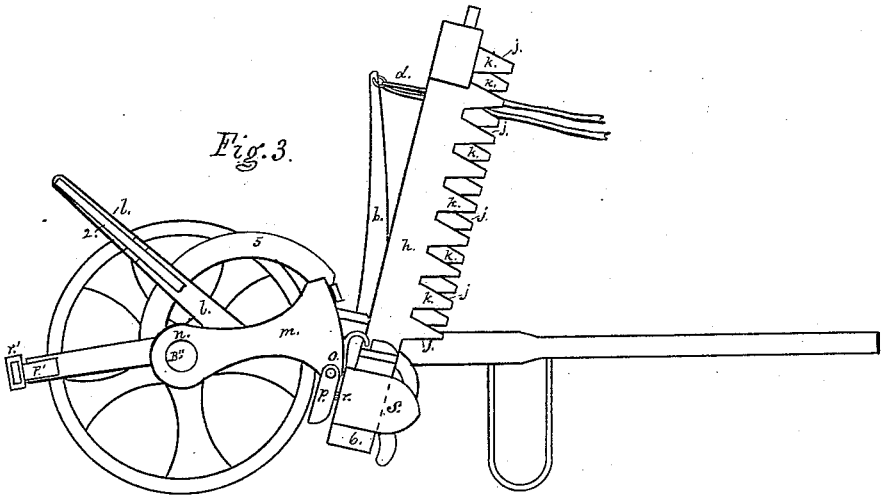


Fig. 5.

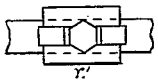


Fig. 6.

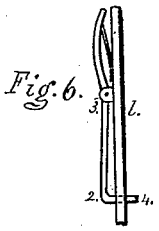


Fig. 7.

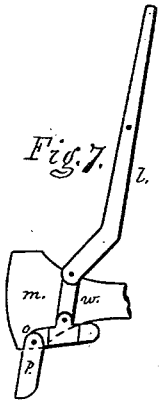
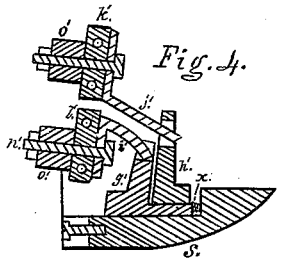


Fig. 4.



Witnesses

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A. C. Johnston

Inventor

Robert Campbell.

By Johnston & Donn.

his attorneys

UNITED STATES PATENT OFFICE.

ROBERT CAMPBELL, OF ALLEGHENY, PENNSYLVANIA.

IMPROVEMENT IN HARVESTERS.

Specification forming part of Letters Patent No. **208,461**, dated October 1, 1878; application filed November 1, 1877.

To all whom it may concern:

Be it known that I, ROBERT CAMPBELL, of Allegheny, in the county of Allegheny and State of Pennsylvania, have invented a new and useful Improvement in Harvesters; and I do hereby declare that the following is a full and exact description thereof, reference being had to the accompanying drawings, and to the letters of reference marked thereon.

My invention relates to an improvement in harvesters; and consists, first, in the sliding heads, each furnished with a coupling-arm, arranged within the groove of the motor or driving wheel, for moving two cutting-bars in opposite directions in the operation of cutting, in combination with said cutters and connecting devices, hereinafter described; second, a sliding head provided with scrapers, in combination with a motor or driving wheel having a zigzag groove in its periphery, the former arranged in the rear of the latter, with the scrapers operating within said groove; third, the combination of an elevating-lever and pivoted frame and two cutter-bars that move in opposite directions with devices which connect the cutters with the driving-wheels; fourth, a checking-lever, combined with two cutter-bars that move in opposite directions, and so arranged that the former will, through the medium of the reins of the harness, check the team in case the latter comes in contact with any undue obstruction.

To enable others skilled in the art to make and use my invention, I will proceed to describe its construction and operation.

In the accompanying drawings, which form part of my specification, Figure 1 is a perspective view of my improvement in harvesters. Fig. 2 is a top view or plan, representing a portion of the cutter-bars and cutters broken away and the motor-wheel removed. Fig. 3 is a side elevation of my improvement in harvesters. Fig. 4 is a vertical detailed section at line *y* of Fig. 2. Fig. 5 is a detailed view of the cleaner for the groove in the motor-wheel. Figs. 6 and 7 are detailed views.

In the accompanying drawings, A represents the motor-wheel for driving the cutter-bars *g* and *h*. This wheel A may be constructed in two parts, or cored out, so as to form a zigzag groove in its periphery, as indicated at *i*. The angles of the groove *i* in the wheel A must in all cases correspond to the angle of the cutting-edges *j* of the cutter *k*, which may be made separate from the cutter-bars, if so desired; or said cutters may be made in sections of two or more, and secured on and to the cutter-bars.

The angles of the groove of the drive-wheel correspond with the angles of the cutting-edges of the cutters—that is to say, there is such a mechanical and mathematical construction of the respective angles as that they shall concur in avoiding needless velocity, needless concussion, distribute the effect of resistance equally along the cutting-edges, regulate the velocity to suit the material being cut, and regulate the lateral cut or throw of the cutter in order to obtain the least draft.

When the angles above mentioned correspond, as aforesaid, the effective force meets the resistance in such a form as gives the best result from the least expenditure of force. If, for example, the distance between the points of the cutters be two inches, the apex in the angle of the groove should be one and one-eighth inch from the base, or one and one-eighth inch above the lower adjacent angle, one-eighth of an inch being an allowance or margin for loss by whetting the cutters. If the feed be one and one-half inch, the apex must be not less than seven-eighths of an inch in height. If the apex of projections be one inch and the face of the incline two inches, then the cutting-edge of the cutter should not be less than two and one-fourth inches.

The wheel A is secured on one end of the axle B″, which is pivoted in the frame *f*, to which also is secured the seat A′ for the driver and the tongue B′ of the running-gear. On the opposite end of the axle B″ is pivoted a wheel, B, which, in diameter, corresponds to the diameter of the motor-wheel A. To the frame *f* is pivoted an L-shaped lever, *l*, to the lower end of which is pivoted a link, *w*, which is connected to the frame *m*, which is pivoted to the axle B″, as shown at *n*. The lever *l* is provided with a spring-latch, 2, pivoted at 3 to said lever, the lower end of said latch having a pin, 4, which catches in openings in arc 5 of the frame *f*. By the operator pressing on the spring-latch 2, so as to withdraw the pin

4 out of the opening in the arc 5, and then drawing back the lever *l*, he will elevate the frame *m* and the cutter-bars *g* and *h*, as shown in Fig. 3. The curved piece 6 of the shoe *s*, resting against the lower end of the lever *b*, serves as a fulcrum in the operation of elevating the frame *m* and cutter-bars *g* and *h*. At *o* is pivoted to the frame *m* a curved arm, *p*, to which, at *r*, is pivoted a shoe, *s*, in which, in guides *t* and *u*, move the inner ends of the cutter-bars *g* and *h*. The cutter-bars *g* and *h* are susceptible of a slight movement back and forward, and are held in their forward position by means of a spiral spring, as shown at *x* in Fig. 2. To the frame *f* is pivoted a lever, *b*, the end *c* of which projects below the front edge of the cutter-bars *g* and *h* at their inner ends, so that in the event of the cutters *k* coming in contact with any undue obstruction, forcing them back, the upper end of the lever *b* will be thrown back. The reins of the harness of the team being attached to the upper end of the lever *b*, as shown at *d* in Fig. 3, the back movement of the lever *b* will draw on the reins and check the team. The cutter-bar *h* is provided with guides *e'* and *f'*, in which moves the upper cutter-bar *g*. (See Fig. 1.) Each one of the cutter-bars *g* and *h*, at its inner end, is provided with a vertical projection, *g'* and *h'*, with an opening in each for the arms *i'* and *j'*, projecting from the sliding heads *k'* and *l'*, which move on guides *m'*, secured in the pivoted frame *m*.

By this connection between the sliding heads upon the wheel and the cutter-bars, it will be seen that when the cutter-bars are raised by means of the lever *l* the curved arm *p*, which is pivoted to frame *m*, will, as the same is raised, turn upon its pivot, so as to admit of the disengagement of the arms *j' i'* from the openings in the projections *g' h'*, thereby throwing the cutter-bars out of gear with the driving-wheel.

On the inner side of each of the sliding heads *k'* and *l'* is an inward-projecting arm, *n'*, provided with an anti-friction wheel, *o'*, which moves within the zigzag groove *i* in the motor-wheel A. To the rear part of the frame *f* is attached an arm, *p'*, on which moves a sliding head, *r'*, on the inner side of which is an arm, *s'*, which is furnished with scrapers *t'*, which move within the zigzag groove *i* of the motor-wheel A, for the purpose of keeping said groove and its walls clean.

It will be observed that the scrapers *t'* will always clean the groove *i* prior to the movements of the arms *n'* and friction-wheels *o'* in the forward part of the groove *i* of the motor-wheel A.

The motor-wheel A is herein described as having the zigzag groove *i* in its periphery or tread; but it is obvious that the wheel can be constructed so as to have the groove *i* arranged in or on the wheel distant from the periphery or tread without departing from the principle of construction and operation of my invention as applied to harvesters.

Having thus described my improvement, what I claim as of my invention, is—

1. The motor or driving wheel A, having a zigzag groove or channel, *i*, in combination with the sliding heads *k'* and *l'*, with arms *j'* and *i'*, and cutter-bars *g* and *h*, traveling in opposite directions, substantially as herein described, and having projections *g' h'*, with openings for the arms of the sliding heads, substantially as shown and described, and for the purposes set forth.

2. The sliding head *r'*, provided with scrapers *t*, in combination with the master or driving wheel A, having a zigzag groove or channel, *i*, substantially as herein described, and for the purpose set forth.

3. The combination of the lever *l*, link *w*, curved arm *p*, pivoted frame *m*, with the cutter-bars *g h* and sliding heads *k'* and *l'*, adapted to be disengaged from projections upon the cutter-bars when said bars are elevated by the operation of the lever, as described, all constructed and operating substantially as herein described, and for the purpose set forth.

4. In a harvester, the check-lever *b*, in combination with the cutter-bars *g* and *h*, arranged and operating with relation to each other, substantially as herein described, and for the purpose set forth.

ROBERT CAMPBELL.

Witnesses:
A. C. JOHNSTON,
JAMES J. JOHNSTON.