2 Sheets—Sheet 1.

S. HULL.

Harvester.

No. 196,458. Patented Oct. 23, 1877.

Fig 1.

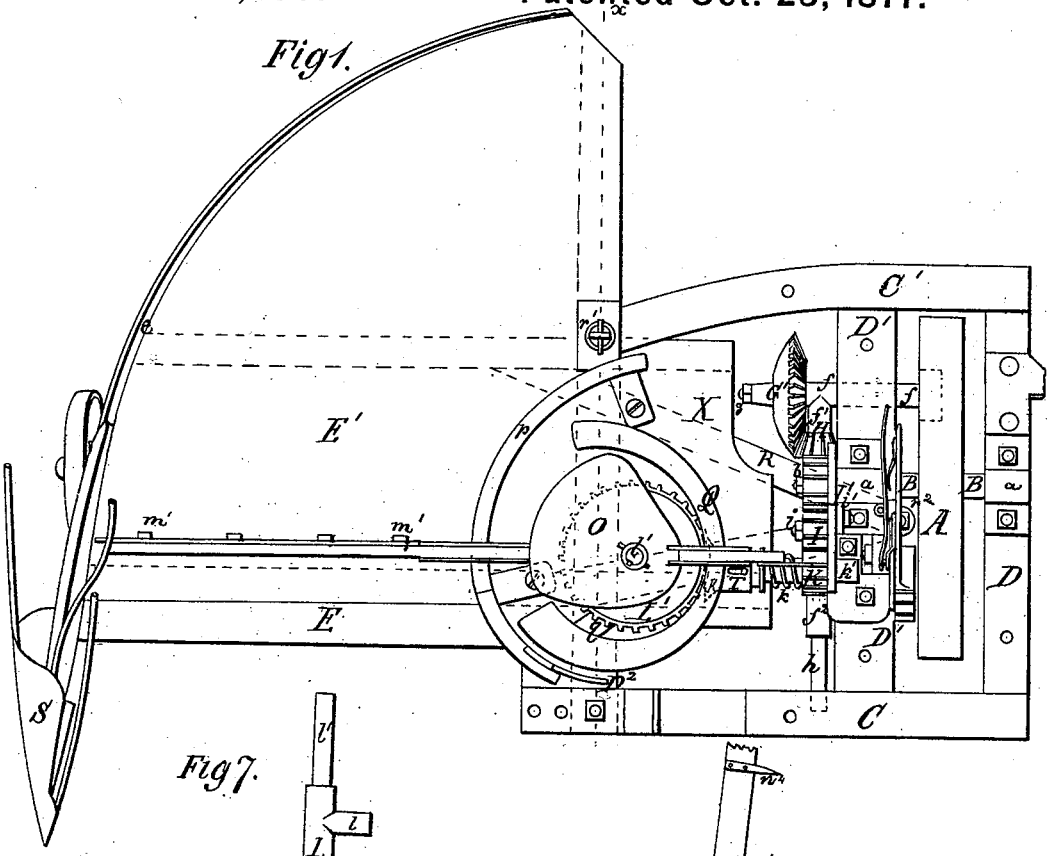


Fig 7.

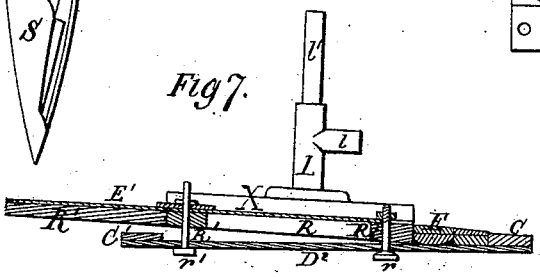
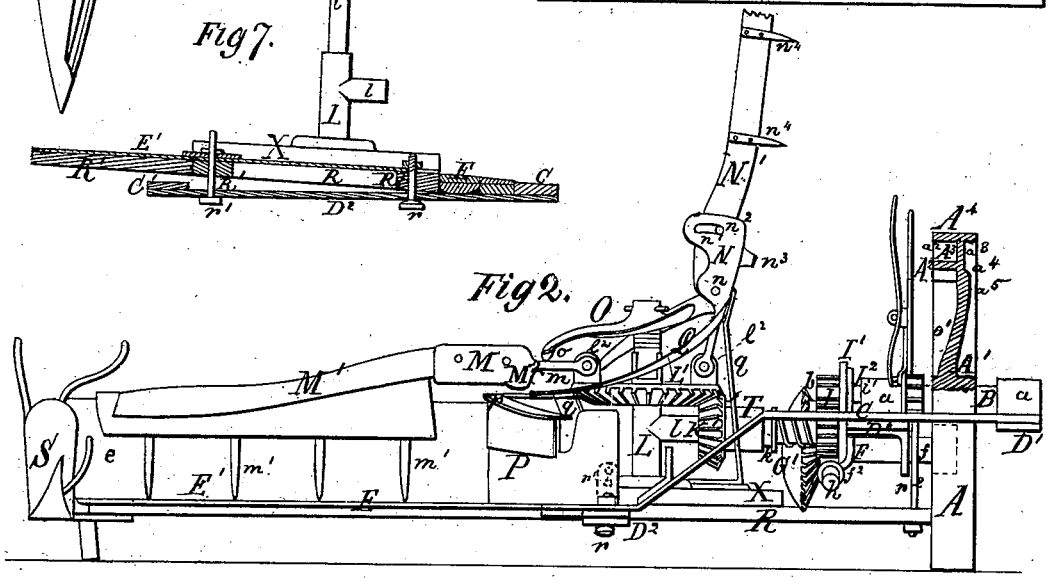


Fig 2.



Witnesses:
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J. S. Theodore Lang

Inventor:
Stephen Hull
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2 Sheets—Sheet 2.

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Fig 3.

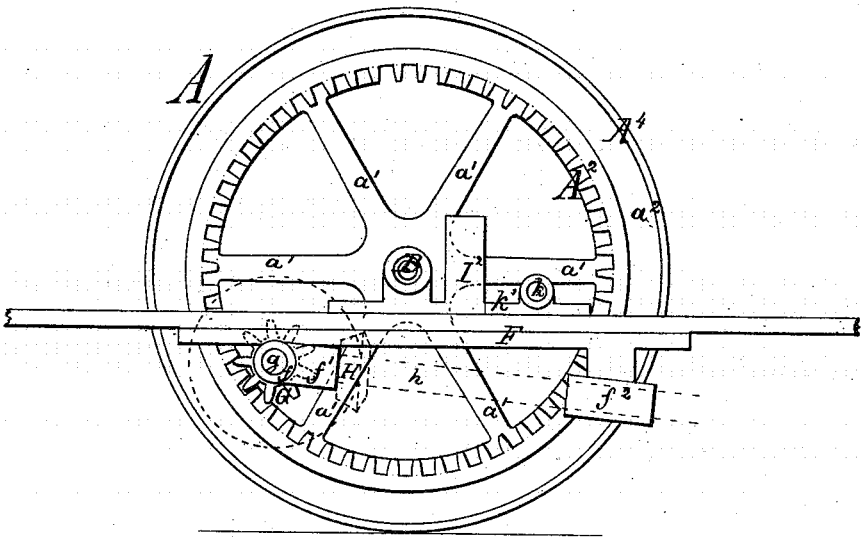


Fig 4.

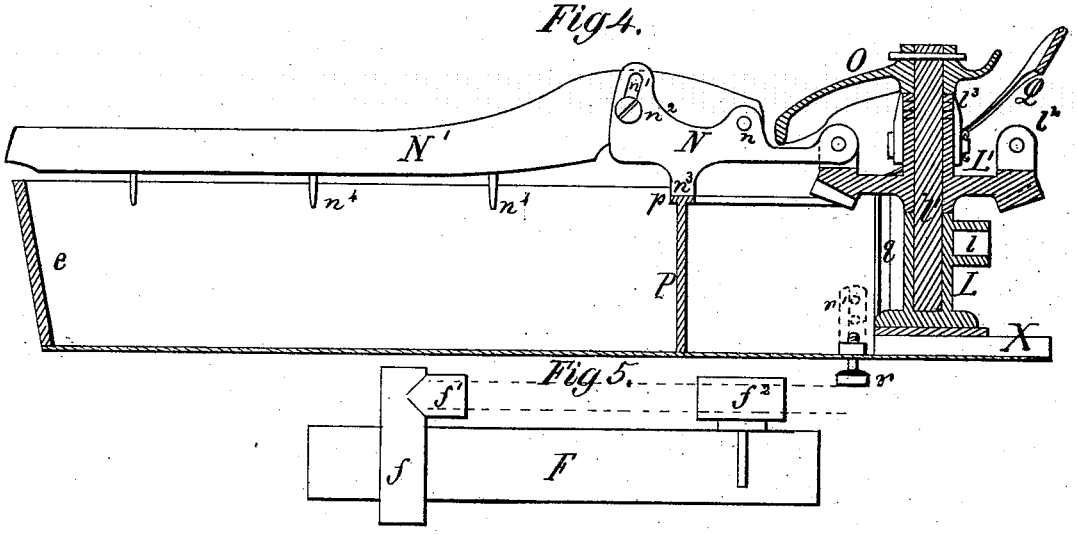
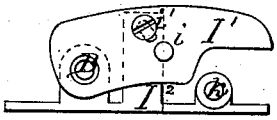


Fig 5.

Fig 6.



Witnesses:
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UNITED STATES PATENT OFFICE.

STEPHEN HULL, OF POUGHKEEPSIE, NEW YORK.

IMPROVEMENT IN HARVESTERS.

Specification forming part of Letters Patent No. **196,458**, dated October 23, 1877; application filed May 18, 1876.

To all whom it may concern:

Be it known that I, STEPHEN HULL, of Poughkeepsie, in the county of Dutchess and State of New York, have invented certain new and useful Improvements in Harvesters, which improvements are fully set forth in the following specification, reference being had to the accompanying drawings, in which—

Figure 1 is a plan view of my improved harvester. Fig. 2 is a front elevation and partial section, the traction driving-wheel being shown in section in order that the construction of the same may be clearly seen. Fig. 3 is a side elevation of a portion of the draft-frame, the traction driving-wheel, its side pinion, and a plate having all the bearings for the sickle-motion formed upon it. Fig. 4 is a vertical central cross-section of the machine through the perpendicular rake and reel arm shaft. Fig. 5 is a bottom view of the plate which has the bearings of the sickle-motion formed on it. Fig. 6 is a detailed view of a swinging plate to which intermediate and interchangeable gear-wheels for changing the speed of the rake and reel apparatus are fastened. Fig. 7 is a detail section taken in the line *x x* of Fig. 1.

The nature of my invention consists in certain constructions, combinations, and arrangements of parts, as hereinafter described and specifically claimed, whereby an improved harvester is produced, as will be herein shown, which is of very simple construction.

To enable others skilled in the art to understand my invention, I will proceed to describe it.

In the accompanying drawings, A represents the driving-wheel, connected with the draft-frame by means of journal-bearings *a*. The said driving-wheel is cast in one piece, and its constituent parts are the hub A^1, the arms a^1, the toothed annulus or inside gear A^2, and an annular web, A^3, which unites the annulus A^2 and the arms a^1 with the tread or rim A^4. The said web A^3 begins at the inner end of the annulus A^2, and thereby forms, with it and with the rim A^4, an annular groove, a^2, in which such soil, stones, and trash as occasionally gather upon the said rim and are lifted up by it are permitted to enter, so that, in falling down, they shall not enter between the teeth of the annulus and its pinion. At the other side of the web A^3 a more shallow annular groove, a^3, is formed by means of the rim A^4 and an annular flange, a^4, of the web, to which the arms a^1 are united. The arms a^1 are, at the said point of union, curved outwardly, as seen at a^5 in Fig. 2.

The described formation of the arms a^1 and the flange a^4 serves to prevent soil which is carried up on the corresponding side of the rim A^4 from falling on the hub below, or on the pinion of the driving-wheel.

The shaft B of the driving-wheel passes beyond its bearing *a* on the grain side, and is there provided with a pinion, *b*. The frame to which the said bearings are fastened consists of the bars C C′ and D D^1 D^2. The bars D D^1 are parallel, and are supported by the bearings *a* of the driving-wheel. They are also in a higher level than the bar D^2, which unites the grain ends of the bars C C′, for which purpose the latter bars are bent down toward the level of the finger-bar E, as seen in Fig. 2. The intermediate bar D^1 has a plate, F, attached below it, which has the journal-bearings f f^1 f^2 of the sickle-motion attached to it. The pinion G of the said sickle-motion gears into the annulus A^2, and, by means of a bevel-gear wheel, G′, on its shaft *g*, at the other end of its journal-bearing *f*, transfers its motion to the bevel-gear wheel H on the shaft *h*, which is supported by the journal-bearings f^1 f^2, and has at its other end the balance or crank wheel of the sickle-bar.

Motion for the operation of the rake and reel arms is obtained from the pinion *b* on the main shaft B. From there it is communicated to the pinions I and K, which latter is fastened to the shaft *k*. The wheel I revolves on a stud, *i*, fastened to a plate, I^1, which is made to swing on the main shaft B, and is secured in its position by a bolt, *i′*, and an upright stand, I^2, forming a part of the journal-bearing *a*.

The stud *i* is not moved on the plate I^1, as the central distance of the two wheels *b* and I, which are of different size, remains unchanged when the wheels are exchanged for the purpose of changing the speed of the combined rake and reel. In case of such an exchange the central distance between the wheel I on the stud *i* and the wheel K is changed, and in order to secure the gearing condition of the said wheels the stud *i* must be kept

closer to or farther from the axis of the shaft of the wheel K, which is done by loosening the bolt i' and swinging the plate I^1 toward or from the said axis.

By substituting for the smaller wheel K the larger wheel I, the speed of the combined rake and reel will be decreased, and vice versa by replacing the said wheels in their original positions. The shaft k has one bearing, k', on the bar D^1, and another, l, in the upright stand L, which is fastened upon an intermediate platform, X. A wheel, K', at the other end of the shaft k communicates its motion to the crown-wheel L' upon the upright shaft l^1 in the stand L. To the top of the wheel L' a number of stands, l^2, are attached, to which the shoes M of the rake-arms M^1 and shoes N of the reel-arm N' are hinged or pivoted in alternate order. Above the crown-wheel L', and below the rake-head cap O, a number of washers, l^3, are fitted on the shaft l^1, which, by being removed from below the cap and put above, serve to keep the said cap in different levels, as may be desirable, and permit a speedy vertical adjustment of the rake-head cap O on the shaft l^1. The rake-head cap O has a bearing-rim, o, at the grain side, which bears on the forked stem m of the rake-arm shoe M, and thereby keeps the rake-teeth m' of the rake M^1 down upon the grain-platform E'.

The reel-arm N' is made adjustable in its reel-arm shoe N by means of a pivot-pin, n, a concentric slot, n^1, in the said shoe, and a set-screw, n^2, for fastening the arm in the desired position.

Q and p are guides for the rake and reel arms M^1 and N'. n^3 and M^2 are bearing projections provided on the shoes of the rake and reel arms.

The diameter or radius of the rake-arm guide Q is far less than the diameter or radius of the reel-arm guide p. The general form of these guides is the same as those in other harvesters having a combined reel and rake, and the difference between the operation of the guides Q and p, and other similar guides, is in the arrangement of the projections n^3 and M^2, the projection n^3 moving clear of the guide Q and running upon the guide p, and the projection M^2 moving clear of the guide p and running upon the guide Q. By these means the rake-arm is allowed to drop down close upon the platform and rake off the grain, and the reel-arm is held up above the platform and allowed to pass over the cut grain; and still both the rake and reel arms are elevated to a vertical position by the guide Q, and guided to their work in the most perfect manner.

The outer end of the reel-arm N' projects over the grain-guard e, so as to be of proper length, and this arm may be provided with short teeth n^4, for the purpose of combing the uncut grain or straightening and guiding the same to the cutters in a parallel position. The vertical elevation of the reel and rake arms, by means of the cam-guides Q, serves to avoid contact with the machinery and the driver, and in their elevated position portions of their shoes N and M' are caused to travel upon the inclined or helicoidal guide Q, which is, by means of legs or stands g, fastened to the platform X.

It will be noticed that the guides p and Q are of unequal radii, and that, therefore, the bearing-points of the shoes of the rake-arms do not reach to the guide p while the rake is sweeping the grain from the platform. By these means the rake-arms are allowed to drop down upon the platform for raking off the cut grain, and the reel-arms prevented from so dropping after they have reeled in the grain to be cut.

The detachable platform X is fastened upon the extension of the grain-platform or its frame R, as shown in Figs. 1, 2, and 7, so that it partakes of all the movements and positions of the grain-platform, and thereby insures a correct and undisturbed motion of the rake and reel arms.

For the purpose of elevating and tilting the grain-platform, or, more especially, the sickle-bar, the main frame of the grain-platform is fastened to the bar D^2 of the wheel-frame, by a rocking bolt, r, with spherical end bearings, and an adjusting-bolt, r^1, and the extreme end of the frame-extension R is suspended by an adjustable bolt, r^2, to the bar D^1. The finger-bar E, with its appurtenances, is fastened to the bar D^2 at one end, and to the grain-divider S at the other end, the same as the front end of the grain-platform.

The movement of the crown-wheel and the rake and reel arms may be stopped at a moment's notice by means of one of the well-known clutch-connections, T, between the shaft k and the loose wheel K', as partly shown in Figs. 1 and 2.

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

1. The combination of the harvester-frame C C' D D^1 D^2, plate F, having journal-bearings f f^1 f^2, and the shafts g and h, all substantially as and for the purpose described.

2. The pinions I, b, and K, of different sizes, and arranged to be adjusted and interchanged, as described, in combination with the main shaft B, plate I^1 pivoted thereto, and the gearing and shafts of the revolving rake, all substantially in the manner and for the purpose described.

3. The combination of the shoes M M^2 and N n^3 of the rake and reel arms, and the cam-guides Q and p, of different radii with respect to the vertical rake-shaft, all substantially in the manner and for the purposes described.

Witness my hand, in this my application for a patent for improvement in harvesters, this 15th day of March, A. D. 1876.

STEPHEN HULL.

Witnesses:
J. FRED LOREYN.
EDWIN MARSHALL.