(No Model.)

2 Sheets—Sheet 1.

D. McRAE.

GRAIN OR HAY STACKER.

No. 385,470. Patented July 3, 1888.

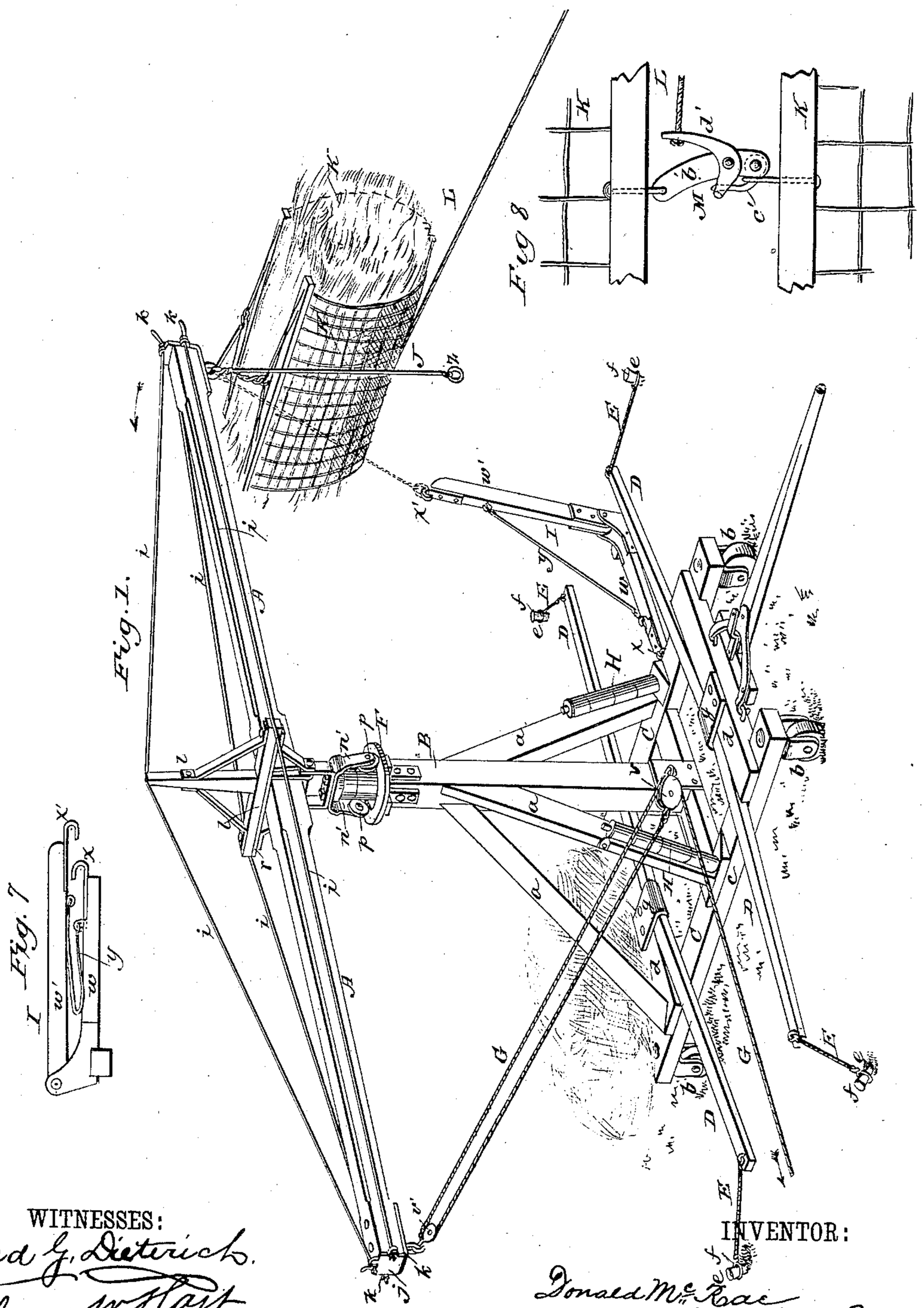

Fig. 1.

Fig. 7.

Fig. 8.

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ATTORNEYS.

(No Model.)

2 Sheets—Sheet 2.

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Fig. 2.

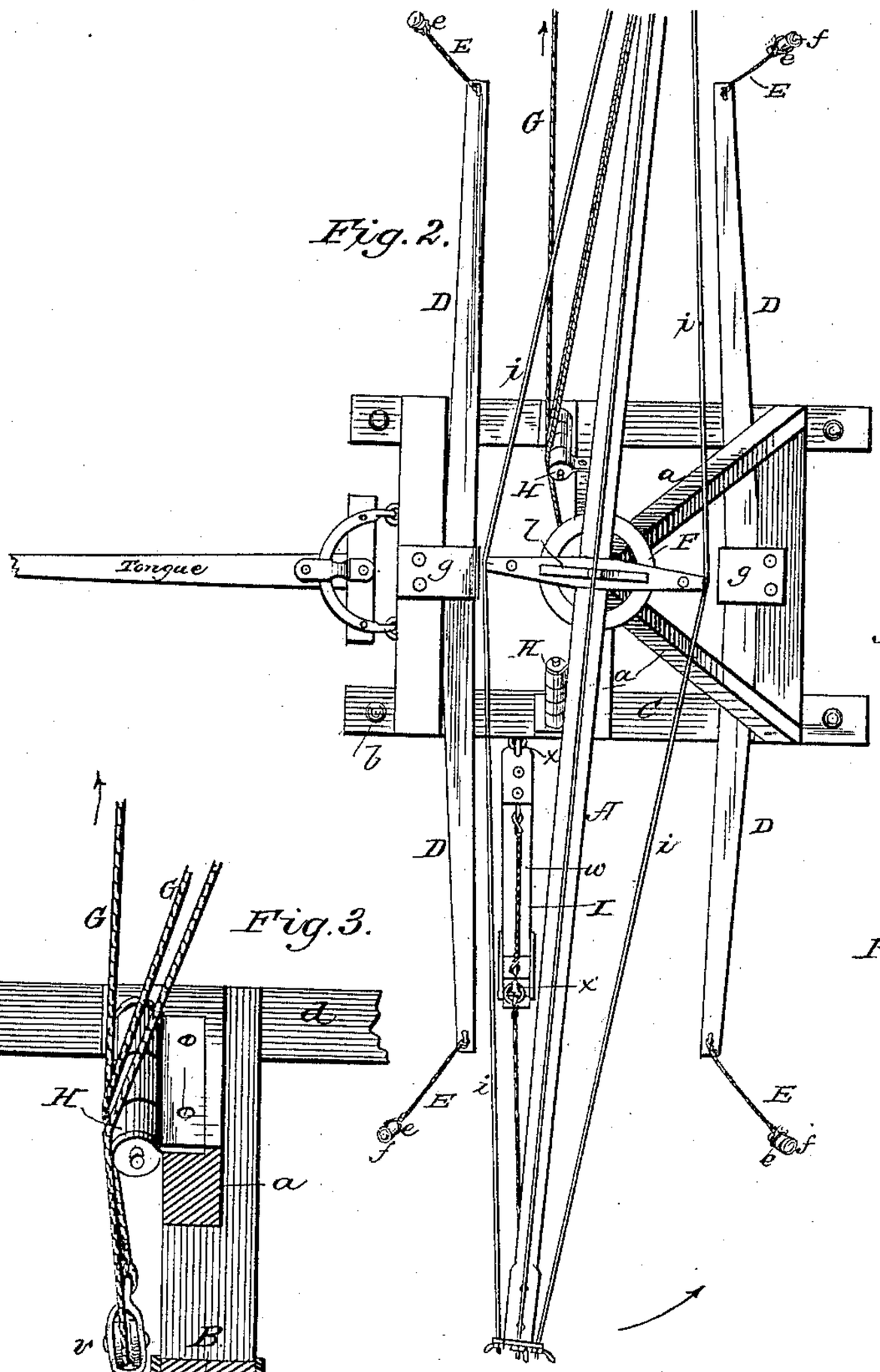


Fig. 4

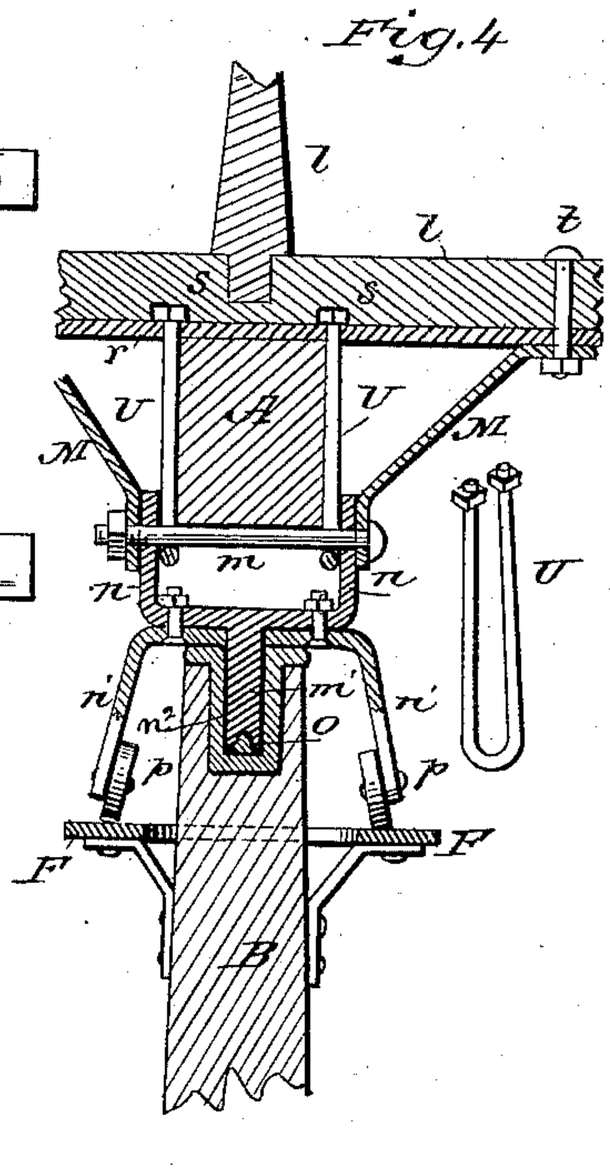


Fig. 3.

Fig. 5

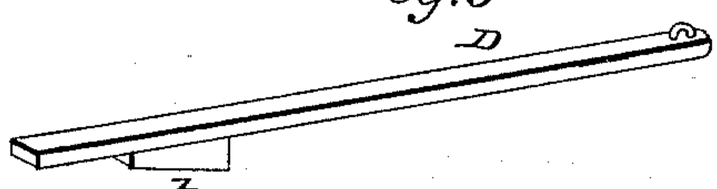
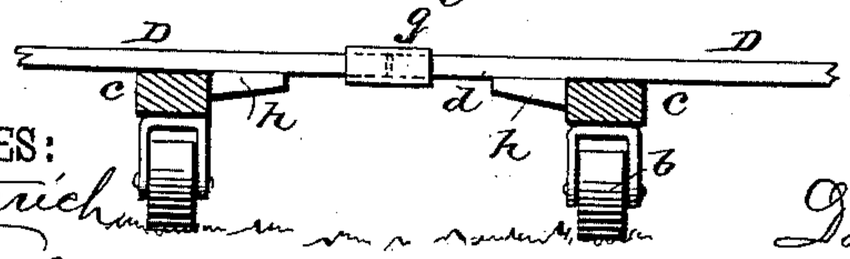


Fig. 6.



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ATTORNEYS.

UNITED STATES PATENT OFFICE.

DONALD McRAE, OF UMATILLA COUNTY, OREGON.

GRAIN OR HAY STACKER.

SPECIFICATION forming part of Letters Patent No. 385,470, dated July 3, 1888.

Application filed December 29, 1887. Serial No. 259,348. (No model.)

To all whom it may concern:

Be it known that I, DONALD McRAE, a resident of Umatilla county, in the State of Oregon, (post-office address Walla Walla, Washington Territory,) have invented a new and useful Improvement in Grain or Hay Stackers, of which the following is a specification.

My invention is an improvement in the class of stackers which are portable and whose main feature is a lever pivoted on an upright and adapted to be swung both vertically and laterally for the purpose of transferring grain, hay, or straw, &c., from a wagon to a stack.

The features of construction and arrangement of parts and their operation are as follows, reference being had to accompanying drawings (two sheets,) in which—

Figure 1 is a perspective view of the stacker, showing it anchored in place and in actual operation. Fig. 2 is a plan view of the main part of the stacker. Fig. 3 is a detail horizontal section of a portion of the frame, enlarged, showing the position and operation of one of the abutments over which the rope passes that operates the pivoted lever. Fig. 4 is a vertical section showing the pivotal connection of the lever and post, the parts being enlarged. Fig. 5 is a perspective view of one of the stay or anchor bars. Fig. 6 is a vertical transverse section of the wheeled frame on which the stacker proper is supported. Fig. 7 is a side view of the counterbalance device folded. Fig. 8 is a detail view of a portion of the hay-sling and its trip device, enlarged.

The long trussed lever A, by which the grain is raised from the wagon, swung around, and deposited on the stack, is pivoted at its center, and thus balanced on a vertical post, B, which is set in the middle of a horizontal base-frame, C, and suitably stayed by lateral inwardly-inclined braces *a*. The said base-frame C is mounted on caster-wheels *b* and provided with a hinged tongue to adapt it to be easily hauled by a team and quickly placed in the desired position for stacking.

I will now describe with such detail as may be necessary the construction, arrangement, and operation of the several parts of the apparatus, beginning with the means for securing the stacker in position for use.

The aforesaid base-frame C consists of two beams, *c*, arranged longitudinally parallel and each having a caster, *b*, attached to each end. Three shorter cross-bars, *d*, are bolted to the beams *c*, one of such bars being arranged near each end of the beams *c* and one in the middle for supporting the pivot-post B. To anchor the stacker, I employ detachable stay-bars D, which are arranged horizontal on the base-frame C and have short ropes E secured to their outer or free ends, which ropes are in turn secured to iron rings *e*, through which pegs or short stakes *f* are driven into the ground, as shown in Fig. 1. These stay-bars are four in number, a pair being used on each side of the base C and projecting laterally therefrom. To secure them to the base C in suitable manner and yet permit them to be easily and quickly placed in position or removed therefrom, I attach a broad clevis-shaped band, *g*, to the inner side of the end cross-bars, *d*, of the base C, and insert the inner ends of each pair of aligned stay-bars D in one of the sockets thus formed, so that each stay is alongside and in contact with the inner side of a cross-bar. To prevent the stays D from being drawn lengthwise out of such sockets *g*, I provide each with a shoulder, *h*, Fig. 5, which abuts one of the beams *c* of the base, as shown in Fig. 6.

It will be seen the ropes E are extended and pinned down diagonally from the ends of the stays D, so that the latter are under some strain, due to leverage against the cross-bars *d*.

In order that the lever A may combine maximum lightness with the required strength, I provide it with tension-rods *i*, which are arranged one above and two laterally from said lever, as shown in Figs. 1 and 2. The ends of these rods *i* are threaded and pass through ears formed on metal plates *j* on the ends of the lever A, and nuts *k*, having lever-handles, are applied thereto for use in adjusting the tension as required. At the middle of the lever said rods *i* bear on vertical and lateral braces *l*, extending a few feet from the lever, as shown in Figs. 1 and 2.

I will now describe the means of double pivotal connection of the lever with the post B, whereby an equivalent for a universal joint is produced. The lever is attached to and swings vertically, Figs. 1 and 4, on a horizontal steel pivot-bolt, *m*, passing through the ends of a U-shaped inverted saddle, *n*, which is riveted

or bolted upon a larger saddle, n', of similar shape, which covers the top of the post B. The vertical steel pivot m' is rigidly secured to or made integral with the upper saddle, n, Fig. 4, and enters a metal socket, n^2, in the top of the post. The lower end of said pivot m' is made concave, Fig. 4, and is stepped on a steel block, o, having a corresponding convexity and placed at the bottom of the socket. This bearing m' o sustains the major portion of the weight of the lever and its load, and by the above-described construction the friction of the bearing is reduced to the degree required to enable the lever A to be swung vertically and laterally with the application of comparatively little force. To relieve the pivot m' of undue lateral strain so far as practicable, I provide a supplemental lateral bearing by means of a circle-plate, F, Figs. 1 and 4, attached in horizontal position just below the head of the post A, and attach small anti-friction wheels p to the pendent and slightly divergent ends of the inverted saddle n', so that as the lever turns laterally these rollers travel on the said circle-plate, as will be readily understood.

It will be seen by reference to Fig. 4 that the lever A is secured to its own horizontal pivot m by means of U-shaped or loop ties U. The said pivot passes through these loops, which are arranged one on each side of the lever, with its ends extending up through a metal bar or plate, r, laid across the top of the lever, and are secured by nuts s, applied to their threaded ends, as shown. This forms a strong as well as secure connection. The horizontal brace l for the lateral tension-rods i is laid upon the said metal bar r, and they are held together by means of screw-bolts t, which also secure the outer ends of the braces M, Fig. 4. The latter extend diagonally upward from the horizontal pivot m'. Thus the braces M assist in sustaining the lever against any tendency to turn on its axis, and also support the outer ends of the cross-bar l and plate r, while the same means or device secures all three together, to wit: the said braces, bar, and plate.

A pulley-block, v, is attached at the base of the pivot-post B on its front side by means of an eyebolt passing through metal plates attached to the latter, and another pulley-block, v', is connected with the end of lever A. A rope, G, is rove through these blocks for use in swinging the lever. In practice a team is attached to the rope and always travels in a direction at right angles to the base C—*i. e.*, parallel to the anchor-stays D.

It will be perceived that if the rope G were drawn straight outward from the post B the lever A could be swung vertically, but not laterally, and thus the load of grain would be raised and held aloft above the wagon, but could not be swung and deposited on the stack. An important feature of my invention here comes into action. It is an abutment, H, attached to a brace, a, of post A and placed in the path of the rope, as shown in Figs. 1, 2, 3, so that the rope must draw across it and also around it, so to speak. It is obvious that by this arrangement the tension of the rope G will have two effects. In other words, it will impart a compound movement to the lever, since it will draw down one end of it, and thus elevate the other and also turn the lever laterally, as required. I may make the abutment H solid; but I propose to employ a series of anti-friction rollers mounted on a suitable journal-rod, as shown in Figs. 1, 2, 3. A single roller would subserve the same useful purpose; but since one part of the rope G travels in one direction and the other in the opposite one, it is obvious that for the best effect a compound roller—*i. e.*, a series of rollers—is required.

The weight of the rope G suspended from one end of the lever A overbalances it. Hence it becomes necessary to employ a means for holding the other end in such position that it may be easily reached and connected with the net or sling in which the grain is contained. For this purpose I employ a device, I, which is adapted for exerting force on one end of the lever in a diagonal direction or exactly opposite to the force applied by the rope at its other end. The said device I consists (see Figs. 1, 7) of two bars, w w', which are hinged together at one end and provided with hooks x x' at their outer ends. One bar, w, is placed on the ground between the stays D and attached to the base C by means of its hook x. The other bar, w', is supported at a slightly obtuse angle to the first one by means of a cord, y, extending between them, as shown. A rope, J, with a ring or loop, z, attached to its lower end, is pendent from the end of the lever which is adjacent to the device I and serves as a means for connecting it with the latter, as shown.

The counter-balance I may be easily and quickly detached from the base C and folded compactly for transportation.

I will now very briefly indicate the general operation of my improved stacker. First, it will be understood that the rope G may be attached to either end of the lever; but in this instance I show the rope connected with the left-hand end of the lever, and will hence describe the operation accordingly. The stacker is placed in position with the rear end of its base C adjacent to the spot on which a stack is to be formed. The lever is then secured to the counter-balance I, as shown. The wagon containing the headed grain resting on a sling, K, (composed of a net secured at its ends to suitable cross-bars,) is driven under that end of the lever, and the said sling is then attached to the latter by means of a suitable grapple or chain. The rope J is next cast off from the hook x' on tension device I, and the team started. The tension of the rope across the roller-abutment H (see Fig. 1) causes the lever to swing sidewise on its vertical pivot m'. At the same time it turns in a vertical plane on its horizontal pivot m. The primary lateral impetus thus imparted to the lever causes it to

swing as far as required—say to a position at right angles to its original one, (although it may swing much farther.) When the trip-cord L, attached to the catch M, which connects the two separable halves of the sling, is pulled, the sling parts and releases the grain, which falls on the stack. The team backs to its former position, the lever is pulled and swung back by means of trip-cord L, and the rope *y* hooked onto the tension device I, as before. Thus the stacker is quickly put in again in readiness to repeat the operation.

I have referred above in somewhat general terms to the catch M. It is shown enlarged in the drawings, and consists of a main bar, *b'*, a pivoted tongue or hook, *c'*, and a trip-lever, *d*, for holding the latter until forced to release it by a pull on the cord L, as will be readily understood without further description.

The catch proper is loosely connected with one part of the sling K, and its tongue passes through a staple on the other part. Then the tongue is inserted beneath one end of the trip-lever. In such position the parts are locked together and may be easily and quickly released, as already described.

My stacker has been used with great success in stacking headed grain; but it is obviously applicable as well for stacking hay or straw, or for depositing the same in a mow or other receptacle, as well as for various other purposes to which a portable derrick may be devoted.

What I claim is—

1. The combination, with the base-frame of the stacker having the parallel cross-bars *d* and bands *g* attached to their inner sides, of the stay-bars D, having shoulders *h*, and the ropes and stakes, as specified, the said stay-bars being arranged horizontally opposite each other in pairs and projecting laterally across the longitudinal side bars of the base-frame, which the said shoulders abut, as shown and described.

2. The combination, with the post B, the base-frame, the pivoted lever A, and the hauling-rope G, attached at base of said post, of the abutment H, composed of a series of friction-rollers mounted on a rod or journal arranged in an inclined position relative to the post and projecting laterally to come in the path of the rope, as shown and described.

3. The combination, with the base-frame and pivoted lever supported on the latter, of the counterbalance device I, consisting of two bars hinged end to end, a cord connecting them, and hooks for attaching with both frame and lever, as shown and described.

4. The combination, with the post B, having the conical step-block placed in its socket, as shown, of the lever and its vertical pivot having a conical seat, whereby it is adapted to be stepped on said block, as shown and described.

5. The combination, with the post and lever and the circle-plate fixed on the former, of the upper inverted saddle to which the lever is pivoted, the lower saddle, *n'*, bestriding the top of said post and having anti-friction rollers which run on said circle-plate, and the vertical pivot *m'*, attached to said saddle, as shown and described.

6. The combination, with the lever A, the upper inverted saddle, *n*, and the horizontal pivot *m*, of the loop-fastenings U, the cross-bar *l*, and metal plate *r*, and the diagonal braces M, all arranged as shown and described.

7. The combination of the diagonal braces M with the lever, the horizontal pivot *m*, the saddle *n*, the horizontal cross-bar *l*, and plate *r*, and bolts for securing said braces, bar, and plate together, as shown and described.

DONALD McRAE.

Witnesses:
THOS. H. BRENTS,
W. P. WINANS.