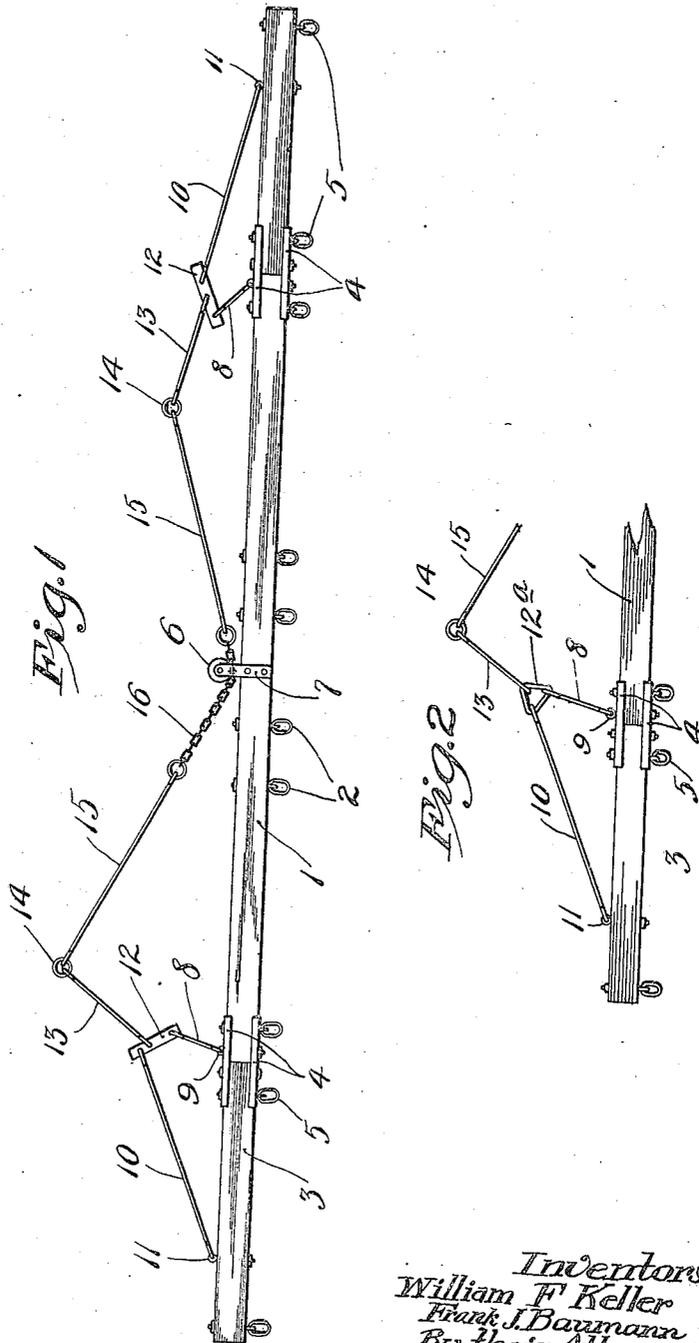


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W. F. KELLER ET AL.  
EQUALIZING HARROW HITCH.  
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# UNITED STATES PATENT OFFICE.

WILLIAM F. KELLER, OF MINNEAPOLIS, MINNESOTA, AND FRANK J. BAUMANN, OF LIDGERWOOD, NORTH DAKOTA, ASSIGNORS TO KELLER MANUFACTURING COMPANY, OF MINNEAPOLIS, MINNESOTA, A CORPORATION OF MINNESOTA.

## EQUALIZING HARROW HITCH.

Application filed September 10, 1921. Serial No. 492,650.

To all whom it may concern:

Be it known that we, WILLIAM F. KELLER and FRANK J. BAUMANN, both citizens of the United States, residing, respectively, at Minneapolis, in the county of Hennepin and State of Minnesota, and Lidgerwood, in the county of Richland, State of North Dakota, have invented certain new and useful Improvements in Equalizing Harrow Hitches; and we do hereby declare the following to be a full, clear, and exact description of the invention, such as will enable others skilled in the art to which it appertains to make and use the same.

Our invention has for its object to improve the construction and operation of what is generally known as "harrow hitches", and to such ends, the invention consists of the novel devices and combinations of devices herein after described and defined in the claims.

These so-called "harrow hitches" include a long drag beam, to which the harrows are attached on the rear side, and to which, draft-equalizing connections are attached on the front side. When these drag beams are made very long for dragging a large number of harrows, they are usually provided with detachable beam extensions, and such long beams require the draft strain to be applied thereto at various different points on the main beam and beam extensions. This has usually been accomplished by either three or four point attachments, but our invention provides a novel way of applying a five point attachment, with one point of attachment at the center of the main beam, one point of attachment near each outer end of the main beam, and one point of attachment at an outer portion of each beam extension.

The invention further involves equalizing devices for properly distributing the strains at the several points of attachment so as to prevent excessive strains at the joints between the outer ends of the main beam and the beam extension. This same type of connection is important, however, even if the entire beam, including its so-called beam extensions, be made in one piece or as a single structure.

The invention is illustrated in the accompanying drawings, wherein like characters indicate like parts throughout the several views.

Referring to the drawings:

Fig. 1 is a plan view showing the beam and equalizing connections thereto; and

Fig. 2 is a fragmentary plan illustrating a slightly modified construction.

The main beam 1 is provided on its rear side with suitably secured devices, such as links 2, to which the harrows, not shown, may be attached in the customary way.

The beam extensions 3 are shown as rigidly but detachably connected to the ends of the main beam 1 by metal straps 4 bolted or otherwise secured thereto. The main beam 1 and extensions 3 are preferably made of wood. The said beam extensions are provided, on their rear sides, with suitably attached links 5 or the like, to which also harrows may be attached.

On the front side of the main beam, at the center thereof, is a guide sheave or wheel 6 journaled to metal straps 7 riveted, bolted or otherwise rigidly secured to said main beam. Short links 8 are pivoted to the outer ends of the main beam 1, the same, as shown, being attached to eyebolts 9 that also serve to clamp the joint straps 4 to said beam. Longer links 10 are pivotally connected to the outer portions of the beam extensions 3, the same, as shown, being connected to eyebolts 11 applied to said beam extensions. The front ends of the co-operating links 8 and 10 are pivoted to the opposite ends of short equalizing levers 12, to the intermediate portions of which links 13 are attached. Rings 14 loosely connect the ends of the links 13 to the links or rods 15, the ends of which latter are shown as connected by a chain 16 that runs against the sheaves 6. Either two or three horse eveners or equalizers are adapted to be connected to the rings or links 14.

The so-called links 8, 10 and 15 act entirely in tension, and, hence, in themselves might be flexible, but are preferably stiff rods because the latter structure is less liable to get tangled up than the more flexible structure suggested.

Under the pulling strain applied to the rings 14, the pulling strain will be equalized or applied to the drag beam equal or on opposite sides of its longitudinal center, and, moreover, the pulling strain applied to the equalizing levers 12 will be properly distributed to the links 8 and 10 and at the

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points where said links are attached, to wit: at the ends of the main beam and at the outer portions of the beam extensions. Preferably, the links 13 are connected closely to the links 10 and to the links 8, because the angle of pull, at the ends of the main beam, is less than the angle of pull at the outer portions of the beam extensions. By the connections described and the arrangement illustrated, the pulling strain will be distributed to the drag beam in a manner that will have the least tendency to bend the same, and will reduce to a minimum the bending strain at the joints connecting the main beam and beam extensions.

The construction illustrated in Fig. 2 is like that illustrated in Fig. 1, except that approximately triangular rings 12<sup>a</sup> are used instead of the equalizing levers 12 to connect the links 8, 10 and 13. These rings 12<sup>a</sup>, to a considerable extent, operate as equalizing levers, but the strain cannot therein be as well distributed as through the equalizing levers 12.

Obviously, this improved device is of simple construction and low cost. Its efficiency has been demonstrated in practice.

What we claim is:

1. The combination with a drag beam, of a flexible equalizing draft connection operatively attached to the central portion of the drag beam and having levers at its opposite ends, and drag connections between the opposite ends of the equalizing levers and the ends of the drag beam.

2. The combination with a main drag beam having detachable beam extensions at

its ends, of a flexible equalizing draft connection operatively attached to the central portions of said main beam and having equalizing levers at its opposite ends, and draft connections between the opposite ends of said equalizing levers and the outer ends of said main beam and said beam extensions.

3. The combination with a main drag beam having detachable beam extensions at its ends, of a guide sheave attached to the central portion of the main beam, relatively short and long links connected respectively to the outer ends of said main beam and to the outer portion of said beam extensions, equalizing levers pivotally connected to the ends of co-operating long and short links, laterally spaced coupling rings, links connecting said coupling rings to the intermediate portion of co-operating equalizing levers, and a flexible equalizing draft connection attached to said coupling rings at its ends with its intermediate portion running against said guide sheave.

4. The combination with a main drag beam having attached beam extensions at its ends, of a flexible equalizing draft connection operatively attached to the central portion of said main beam and having equalizing coupling devices at its opposite ends, and draft connections between said equalizing coupling devices and the outer ends of said main beam and beam extensions.

In testimony whereof, we affix our signatures.

WILLIAM F. KELLER.  
FRANK J. BAUMANN.