CRAMTON & SPICER.

Three Horse Equalizer.

No. 80,060. Patented July 21, 1868.

Fig. 1.

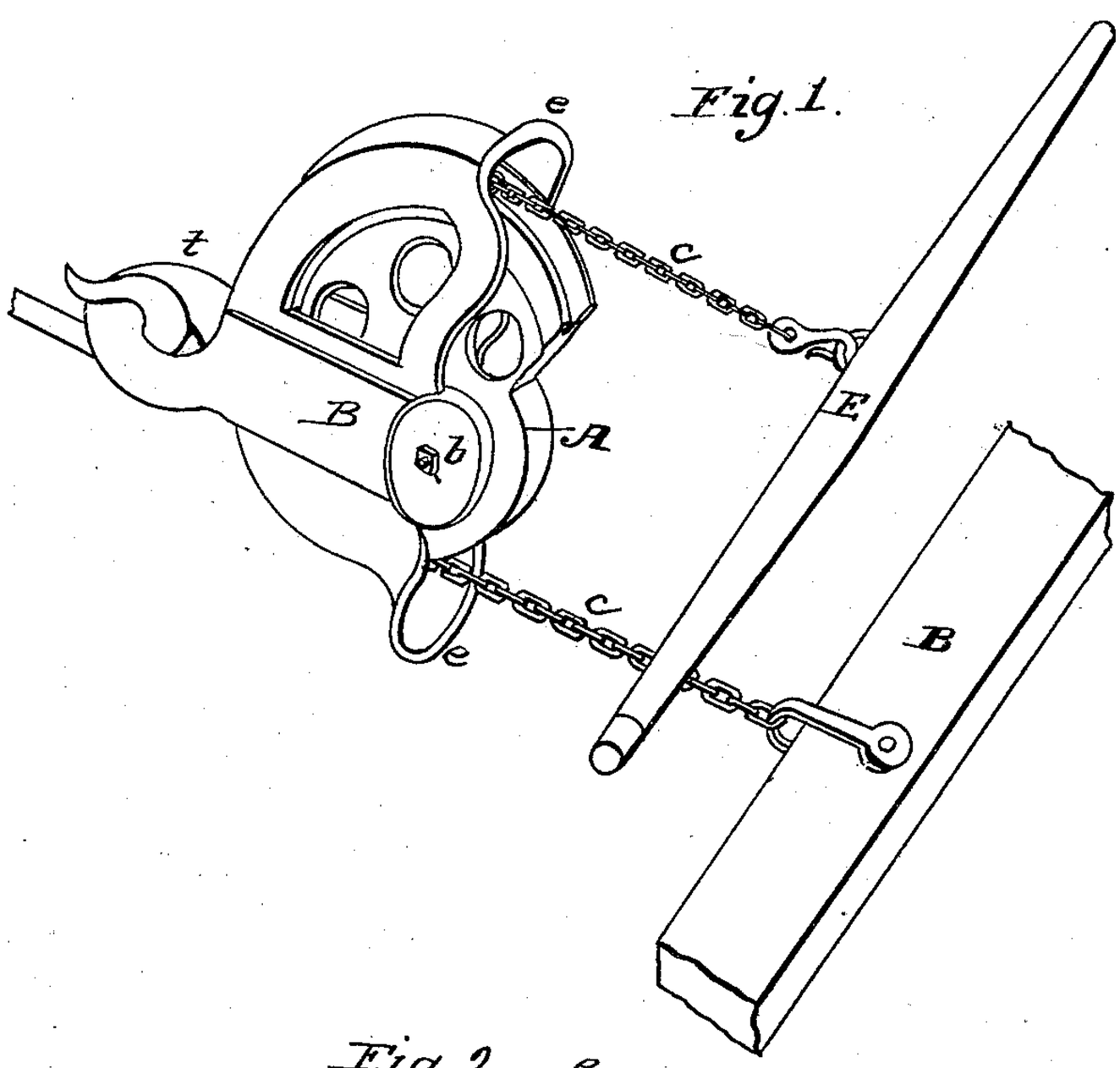
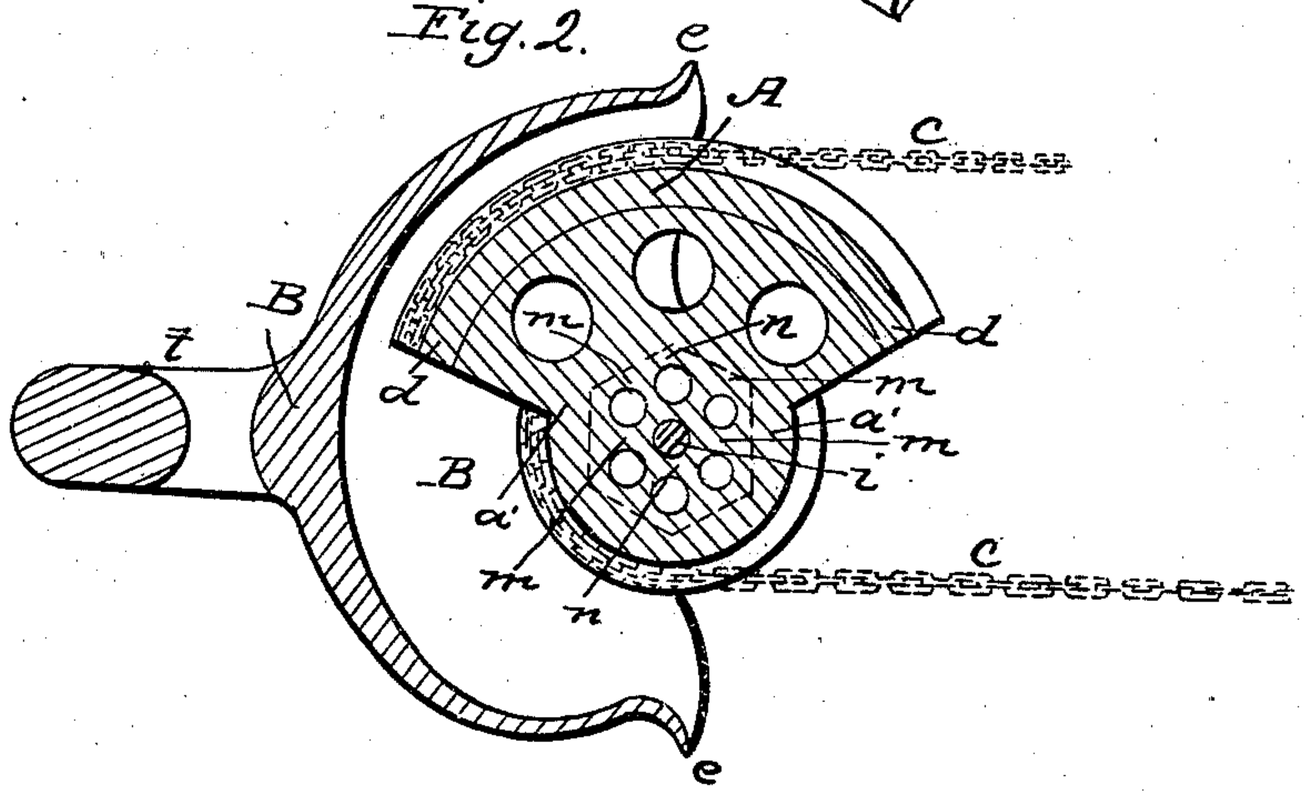


Fig. 2.



Witnesses:

B Chamberlin

Otto L Johnson.

Inventors:

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United States Patent Office.

GILES CRAMTON AND PRATT A. SPICER, OF MARSHALL, MICHIGAN.

Letters Patent No. 80,060, *dated July* 21, 1868.

IMPROVEMENT IN THREE-HORSE EQUALIZER.

The Schedule referred to in these Letters Patent and making part of the same.

TO ALL WHOM IT MAY CONCERN:

Be it known that we, GILES CRAMTON and PRATT A. SPICER, both of the city of Marshall, in the county of Calhoun, and State of Michigan, have invented a new and useful Improvement in Apparatus for so Equalizing the Power in a Team of Three Horses as to enable them to travel free in line abreast; and we do hereby declare that the following is a full, clear, and exact description of the construction and operation of the same, reference being had to the annexed drawings, making a part of this specification, in which—

Figure 1 is a perspective view.

Figure 2 is longitudinal vertical section in the centre line of draught.

Similar letters of reference indicate like parts in both figures in the drawings.

Our invention relates to what we term a differential-power sheave, partially encased, and provided with changeable pivot-centres, to be employed, in connection with a draught-chain or other tug, as an intermediate device between a plow or other object and a draught-team of three horses travelling abreast.

The object of our invention is to so control, by equalization, the draught-power of the team that each individual horse may be enabled, or readily compelled, to perform his proper share of the work, and keep his place in the line, or nearly so; and, the better to enable others skilled in this branch of mechanical art to construct our invention, we will now proceed to describe it.

A represents the sheave, of cast iron. We shape its periphery (which may be flat or grooved) in the form of two unequal circular arcs, the portion between *a a* being the arc of a circle, the radius of which is double that included between *a' a'*, both arcs being struck from a common centre.

We place said sheave within a cast-iron guard-sheath, B, as to only partially encase it, (substantially as seen,) and hang it on a through pivot-bolt, *b*.

We cast the guard-sheath in a single piece, with an eye-tongue, *t*, or other equivalent, by which it may be suitably coupled to a plow, &c., and with flaring lips, as seen at *e*, to prevent the hitching-chains C, or rope or other tug, (working over the sheave,) from catching or fraying while moving back and forth in a slackened state; and, as our sole object in hanging the sheave within a light guard, instead of hanging it simply within a common clevis, is to secure the chain, &c., from kinking, or getting out of its place on the sheave, while backing or turning, &c., such portions of the sheath as act as a mere guard may be further lightened by open work.

One piece of chain, secured to the sheave at *a'*, on the left, passes over the small circular arc, and connects with the double-tree D, (broken off,) to which the two outer horses are hitched, as usual; and the upper chain is connected at *a*, and, passing over the arc of double leverage, is hooked to the whiffle-tree E of the middle horse; but we do not wish to confine ourselves to the use of two separate chains or tugs, for it is evident that a single one, passing over, and bent and confined in the inner angle of the offset at *a'*, will perform the same duty.

The general leverage principle involved in the operation of our differential-power sheave is so familiar, in view of the many analogous devices for enabling the middle horse to travel abreast with the two outside horses in a team of three, that we do not deem it necessary to give any further explanation, except what we deem necessary to point out as peculiar to our invention.

The arrangement is compact, light, and always ready for use. The draught-chains, connecting in a straight undeviating line, preserve equilibrium, and cannot be disarranged upon, or work off from, the sheave, no matter what its position may be, as it is fully protected, with the chains, within the guard-sheath.

The sheave is so constructed and provided that, when it is vibrating back and forth, by reason of the single horse in the middle, or the team of two outside, getting alternately a little ahead, the relative leverage is constantly maintained; or, in the case of ill-matched teams, when it may be found compatible with their habits and temper, the common pivot-centre at *i* may be shifted, on either side, to additional holes, *m*, in the sheave, which will change the action of the circular arcs from concentric to eccentric, and change the relative leverage during the vibrations as may best steady the team.

The double leverage given the single middle horse presupposes that it is equal in draught-power to half the

collective power of the two outside ones, but this is seldom the case. Therefore, to equalize the teams exactly in this respect, we furnish extra pivot-holes, as at *n;* but the same result might be had with greater exactness by an adjustable rim, fitted to and connected with either-one of the circular arcs of the sheave; also, instead of boring through the body of the sheave, a polygonal-sided plug, having one hole for the common centre, and one or two more for the shifts, may be placed in a corresponding-formed eye, cast in the sheave, (see dotted lines,) and the centre changes made by simply shifting the plug to different places in the eye.

We do not claim broadly working the draught-chains over circular arcs of a radius, as one to two; but

We claim as new, and desire to secure by Letters Patent, the following:

Providing the sheave A with a polygonal or other suitably-shaped shifting-eye plug, said plug to be inserted in a position either concentric or eccentric with the equalizing-rims of the sheave, and perforated with either one or all of the pivot-holes *i m n*, substantially as and for the purpose hercin set forth.

GILES CRAMTON,
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Witnesses:
GEORGE JOHNSON,
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