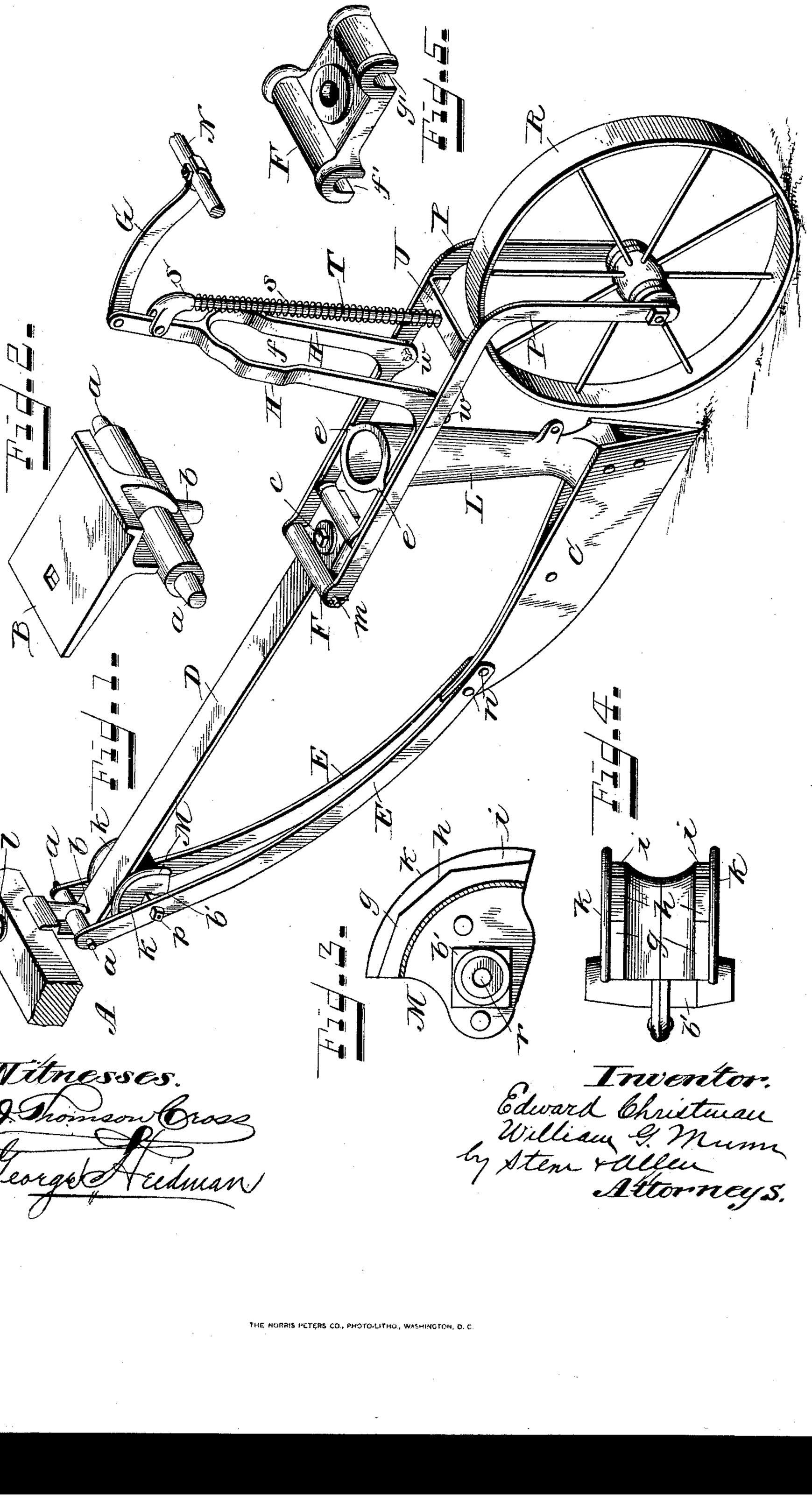
(No Model.)

E. CHRISTMAN & W. G. MUNN.

GRAIN DRILL.

No. 497,864. Patented May 23, 1893.



Witnesses.
J. Thomson Cross
George H. Fuelman

Inventor.
Edward Christman
William G. Munn
by Steen & Allen
Attorneys.

UNITED STATES PATENT OFFICE.

EDWARD CHRISTMAN AND WILLIAM G. MUNN, OF LOUISVILLE, KENTUCKY, ASSIGNORS TO THE BRENNAN & CO. SOUTHWESTERN AGRICULTURAL WORKS, OF SAME PLACE.

GRAIN-DRILL.

SPECIFICATION forming part of Letters Patent No. 497,864, dated May 23, 1893.

Application filed December 10, 1892. Serial No. 454,736. (No model.)

To all whom it may concern:

Be it known that we, EDWARD CHRISTMAN and WILLIAM G. MUNN, citizens of the United States, residing at Louisville, in the county of Jefferson and State of Kentucky, have invented certain new and useful Improvements in Grain-Drills, of which the following is a full, clear, and exact description, reference being had to the accompanying drawings, forming part of this specification.

Our invention relates to improvements in grain drills more particularly to those known as "shoe" or "runner" drills, and consists in the novel construction and arrangement of parts to be hereinafter more particularly pointed out and claimed.

The object of our improvements is to furnish a simple, cheap, and effective means for applying spring pressure to the runners and covering wheels of the drill, so that the pressure may be varied at will, in accordance with the nature of the ground and whenever else desired, and to so construct and arrange the parts, that the wear on the pivotal connections will be taken up, so that the proper alignment of the shoes may be always retained.

In the drawings:—Figure 1 is a perspective view of one of the runners and covering wheels of the drill with our improved spring pressure device in connection therewith, all the other parts of the drill being removed. Fig. 2, is a perspective view of the hanger casting by which the forks of the drag bar are pivoted to the main frame. Fig. 3, is a sectional side elevation of the cam piece against which the spring for the shoe bears. Fig. 4, is a top plan view of same. Fig. 5 is a perspective view of the plate for holding the pressure spring.

A, is a portion of the main frame of the drill, and B a hanger-casting or bracket, to which the drag bars of the shoe are pivoted each hanger being secured to the main frame by the bolt *l*.

C, is one of the shoes or runners of the drill. To each of these shoes, drag bars E, E, are riveted at *n*, *n*, the tendency of the drag bars being to spring toward each other. The hanger B is provided with two pivots *a*, *a*, upon which the upper ends of the drag bars E, E, are pivoted. These pivotal points *a*, *a*, are tapered as shown in Fig. 2, and the holes at the ends of the drag bars by which they are pivoted, are made smaller than the diameter of the broader portion of the pivots *a*, *a*, the tendency of the drag bars E, E, being to spring toward each other; as this pivotal connection of the parts wears in use, the spring of the drag bars will take up the wear, and thus the alignment of the shoes will always remain perfect. This construction forms one of the novel features of our invention. While the tapering of the pivots to take up the wear is not new, we believe that it is new to place the pivots on the outside of the hangers and on the inside of the drag bars, so that the wear will be automatically taken up by the natural spring of these drag bars.

D, is a flat steel spring bar, by means of which the pressure is applied to the runners. Extending downward from the hanger B is a pin *b*, and the spring D is secured to this pin through a suitable opening in the end thereof. The pressure on the spring at the other end being always downward, no nut or other fastening is required to hold the spring in place. At the other end of the spring bar D, is a plate F, to which the spring bar is secured by bolt and nut *c*.

N, is a rock shaft extending horizontally across the machine from one side of the frame to the other, and provided with a suitable hand lever and locking mechanism (not shown in the drawings), by which the shaft N is rocked and locked in any desired position. Secured to this shaft at suitable intervals, one for each runner, is a series of connecting arms G, to each of which is pivoted a stirrup or connecting link *f*, divided into two forks H, H, which extend downward on either side of the boot or feed tube L of the runner and underneath the ears *e*, *e*, on the upper end of the feed tube. Extending across between the inner ends of these forks, is a bolt or pin preferably cast solid with the stirrups. This pin rests in the groove *g'* at the outer end of the plate F and on top of the outer end of the spring D, so that in this way the stirrups *f* are pivoted to the spring D and all strain is removed from the bolt *c* by which the plate F and spring D are connected. The inner end

of the plate F, is provided with a similar groove *f'* within which the bolt *m*, is placed resting on the spring D and upon the outer ends of this bolt the arms P, P, are pivoted. These arms P, P, extend back rearward and carry journaled at their lower ends the covering wheel R. Coupled at the upper end of the stirrup *f*, by the casting S, is a rod T, around which is coiled the spring *s* bearing upon the plate U, secured between the arms P, P. The rod T passes down through an opening in the plate U, so that when the stirrup *f*, is depressed by the rocking of shaft N, the pressure of the coiled spring T upon the plate U will be communicated to the covering wheel as will be readily understood.

M, is a cam-shaped casting pivoted between the forks E, E, of the drag bar, by the bolt *p*, immediately underneath the spring bar D, near the upper end of the drag bars. This cam piece is provided with side flanges *k*, *k*, to serve as a guide for the spring bar, and flat bearing surfaces *g*, *h*, *i*, are formed immediately within these flanges *k*, *k*, and upon these flat bearing surfaces, the spring bar D rests. These flat bearing surfaces *g*, *h*, *i*, are formed at unequal distances from the pivotal center *r*, of the cam piece, so that by revolving the cam piece and changing the bearing surfaces for the spring bar, the pressure or tension of this spring may be increased as desired.

Of course as many bearing surfaces as are desired, may be formed on the cam piece, but three or four different positions, are all that would probably be necessary.

The cam piece can be readily turned by a wrench and the hub of the casting is squared at *b'* for that purpose.

The operation of the parts will be readily understood. As the rock shaft N is turned from right to left, through the medium of the arm G and connecting link *m*, pressure will be brought to bear upon the rear end of the spring bar D, which will in turn be communicated to the cam piece M, and to the drag bars and runners. The spring bar D is nothing but a simple straight piece of steel spring, with a hole punched in each end, such as can be readily made in any blacksmith shop, so that the farmer can replace his springs at any time. In addition to this, should the spring bar become bent in use, it can at once be turned over and its elasticity recovered. At the same time that pressure is brought to bear on the runners, through the medium of the coiled spring *s*, the covering wheels are also pressed upon the ground. It will be further seen from our construction that the strain upon the stirrups *f* is very largely reduced when the drill is being operated. The stirrups *f*, and the covering wheel arms P, P, being merely pivoted to the bar D, when pressure is applied to the runners and wheels, the tendency of spring bar D is upward at point *m*, while the carrying wheel arms P, P, by reason of the action of coiled springs *s*, tend to throw the pivotal connection *m* downward. As a result of this counter action the stirrups *f*, are subjected to very little strain. In fact if the springs *s*, were of the same strength as the spring bars D, there would be no strain at all on the stirrups.

When it is desired to lift the runners and wheels from the ground in transporting the machine from one field to another, the rock shaft N, will be turned from left to right, and the forks H, H, of the stirrups *f* will raise the feed tubes and runners through the medium of the ears *e*, *e*. At the same time the lugs *w*, *w*, on each side of the forks H, H, which extend out under the arms P, P, raise the covering wheels from the ground. As the covering wheels are raised their weight causes the arms P, P, to turn on the pivot bolt *m*, and allows the wheels to swing in toward the heel of the shoes. In this way the lifting strain on the stirrups is lessened as the center of gravity of the wheels is brought more directly under the point of lift.

It will further be noticed that should one of the springs become broken, the stirrups *f*, will still support the feed tube and runner, inasmuch as the connection between the stirrups and the spring, is made between the feed tubes and the forward end of the drag bars. Where the pressure springs extend to the rear of the feed tubes and pivotal connection is there made with the rock shaft, any breakage of the pressure springs allows the feed tube and runner to drop down. With our construction however, should any of the pressure springs be broken, the grain drill can still be transported inasmuch as the shoes will all still be supported by the stirrups. Further than this, the construction of our springs and connections is so simple that in case of any breakage of any spring bar, the broken bar can at a moment's notice be replaced by the spring of one of the outside shoes and the drills still used in the field but with one less shoe than before. The absence of one of the outside shoes cannot of course affect the operation of the implement as would be the case if the springs were not readily interchangeable and the broken spring were connected with an inside shoe.

Having thus described our invention, what we claim, and desire to secure by Letters Patent, is—

1. In a grain drill, the combination, with the frame, runners and drag bars pivoted to the frame, of flat spring bars secured at the forward end of the drag bars and extending back toward the shoe, pivotal connection at the other end of the spring with a rock shaft, and bearing plate for the spring bar on the drag bars between the ends of said spring bar, whereby the rocking of the shaft will cause the spring bars to exert pressure on the runners, substantially as shown and described.

2. In a grain drill, the combination, with the frame and runner, of a hanger, a pair of pivot points on opposite sides thereof, and laterally-sprung drag bars secured to the run-

ner at one end and making pivotal connection with said pivots on the hanger at the other end, said pivots on the hanger being located between the laterally sprung ends of the drag bars, substantially as shown and described.

3. In a grain drill, the combination, with the frame and runners, of a hanger and pivot connections thereon for the drag bars, of a downwardly extending pin on the hanger, and flat spring bar secured thereto, with bearing surface for the spring bar between the forks of the drag bars, substantially as shown and described.

4. In a grain drill, the combination, with the runners, drag bars and spring to supply spring pressure thereto, of a cam piece pivoted between the drag bars at their forward ends and provided with a series of bearing surfaces for the spring at unequal distances from the pivotal center thereof, substantially as shown and described.

5. In a grain drill, the combination, with the frame, runners, feed tubes, and drag bars pivoted to the frame, and springs secured at the forward end of the drag bars to supply pressure thereto, of bifurcated connecting links pivoted to the springs between the feed tubes and the pivoted ends of the drag bars and extending back on either side of said feed tubes, projections on the feed tubes to be engaged thereby, and arms on a rock shaft pivoted to said links whereby the rocking of the shaft will raise said feed tubes and runners from the ground, substantially as shown and described.

6. In a grain drill the combination, with the drag bars, runners and covering wheels, springs to supply spring pressure to said runners and wheels, rock shaft, and links connecting said rock shaft and said runner springs, of arms to which said covering wheels are journaled, and pivotal connection therefor with the forward end of said connecting links, substantially as shown and described.

7. In a grain drill, the combination, with the drag bars, runners and covering wheels, springs to supply spring pressure to said runners and independent springs for the covering wheels, of arms, to which said wheels are journaled, and pivotal connection therefor with the outer end of the runner springs, rock shaft and links connecting said rock shaft and said runner springs, substantially as shown and described.

8. In a grain drill the combination, with the frame, runners and covering wheels, of flat spring bars secured to the frame between the forward end of the drag bars and extending back toward the shoe, links pivotally connecting said spring bars to a rock shaft, and arms pivotally connecting said covering wheels to the front end of said connecting links, substantially as shown and described.

9. In a grain drill, the combination, with springs for the runners and covering wheels pivotally connected with said springs between the feed tubes and pivotal end of the drag bars, of stirrups extending back on either side of said feed tubes with lugs on the feed tubes and on said stirrups, and rock shaft connected with said stirrups whereby the rocking thereof will lift said runners and covering wheels from the ground, substantially as shown and described.

EDWARD CHRISTMAN.
WILLIAM G. MUNN.

Witnesses:
L. W. HONRIRE,
E. T. CRAWFORD.