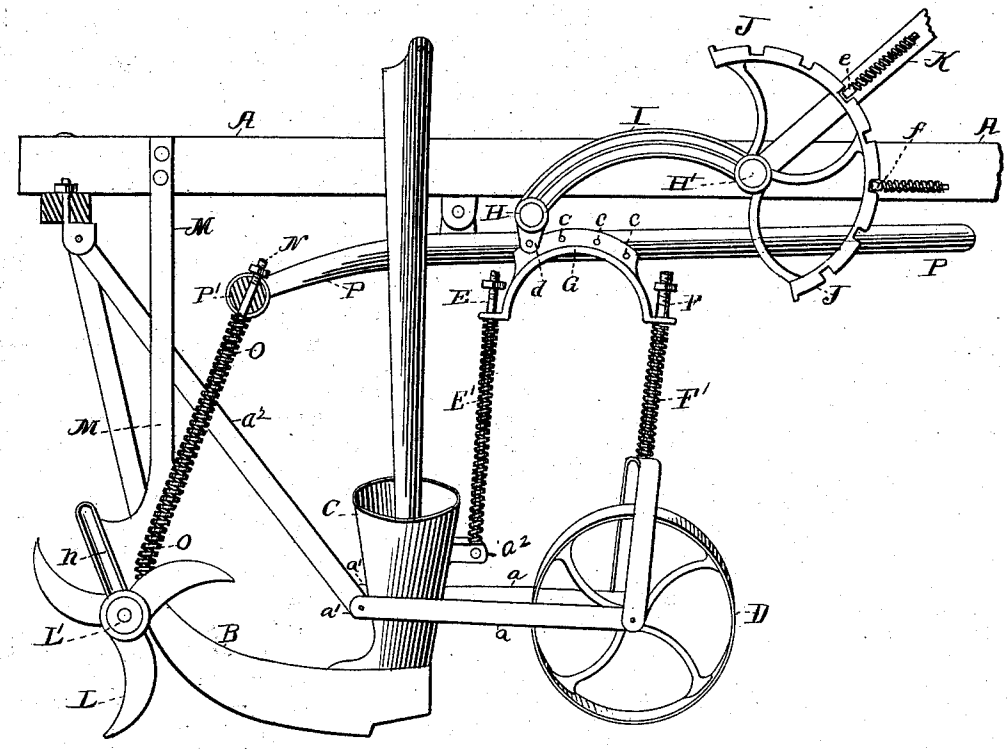
(No Model.)

# W. P. ELAM.

## GRAIN DRILL.

No. 325,512. Patented Sept. 1, 1885.

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# UNITED STATES PATENT OFFICE.

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## GRAIN-DRILL.

SPECIFICATION forming part of Letters Patent No. 325,512, dated September 1, 1885.

Application filed June 18, 1885. (No model.)

*To all whom it may concern:*

Be it known that I, WILLOUGHBY P. ELAM, of Dubuque, in the county of Dubuque and State of Iowa, have invented a new and useful Improvement in Grain-Drills; and I do hereby declare that the following is a full and exact description of the same, reference being had to the accompanying drawing, and to the letters of reference marked thereen.

My invention relates particularly to the class of grain-drills wherein the planting and covering devices are each combined with an independent vertical spring; and the improvements which it embodies consist, principally, of an adjustable connection between these springs, whereby their expansive action can be extended, either separately or together, so as to adjust either or both of the planting and covering devices to the inequalities of the ground-surface; and my improvements further include a trash-cleaner located at the front end of each shoe or furrow-opener, together with means for exerting an elastic pressure upon the same and for adjusting it to the inequalities of the ground-surface, all as more fully hereinafter described and claimed.

For the better understanding of my improvements, together with the details of construction and arrangement, attention is invited to the accompanying drawing, which illustrates a side elevation, partly in perspective, of a set of planting and covering devices of a grain-drill, including my improvements as applied to the same.

Referring to the drawing, A denotes one of the side bars of the main frame of a sulky grain-drill, B the shoe or furrow-opener, C the fluke, and D the covering-wheel, all of a well-known construction and arrangement, except that the bars *a a*, which connect the fluke and covering-wheel, are pivoted at their forward ends to clips *a' a'* on the front of the fluke, instead of to clips on the rear, whereby the wheel runs steadier, and there is less tendency of its having the wabbling motion from side to side, because the bars are stayed by the sides of the fluke. The shoe B and fluke C are secured against lateral play by a tie-rod, $a^2$, and the vertical rod E, surrounded by the spiral spring E', which has bearing upon the fluke by any suitable connection, and the proper position of the covering-wheel D is likewise maintained by the vertical rod F, surrounded by the spiral spring F', which has bearing, as shown, upon a frame that supports the covering-wheel. As heretofore arranged, these vertical rods E and F passed through horizontal bars at their upper ends, and these bars, which were stationary independently, furnished bearings for the upper end of the spiral springs. While these springs exerted a constant pressure upon the fluke and covering-wheel, their expansive action did not exceed three or four inches, and consequently their pressure exhausted when either the fluke or wheel dropped into a dead-furrow that was over four inches deep.

To overcome this objection and to dispense with the two horizontal bars heretofore employed, I use the connecting yoke or arch G, the ends of which are perforated to allow the vertical rods E and F to pass through and furnish bearings for the upper ends of the spiral springs which encircle said rods. The curved portion of this yoke or arch between its two ends is provided with a series of perforations, *c c*, and to this portion is connected a horizontal bar, H, by an intermediate link, *d*, which is pivoted by means of a pin passed through one of the perforations *c*, and through this link. This bar H is rigidly secured to one end of a curved arm, I, and the other end of this arm has rigid connections with a second horizontal bar, H', which has loose bearings in the side bars, A A, of the main frame. On the extreme end of this bar H' is rigidly mounted a toothed segment, J, in which operates a spring-pawl, *e*, of a trigger-lever, K, loosely hung upon the bar H'. Another spring-pawl, *f*, has engagement with this segment J, and by releasing said pawl from engagement with the latter and employing the lever K the yoke or arch G can be raised or lowered to compress or expand the springs E', and F', so as to lengthen or shorten their expansive action.

If there are great irregularities in the soil, and it is desired to give the action of the springs a great play—say seven or eight inches—the operator, by means of an upward lift of the lever K, turns the segment J and sets the same accordingly. This action depresses the bar H and the connecting yoke or arch G, and the springs are compressed, so that when either the fluke or covering-wheel drops into a dead-

furrow its spring will expand sufficiently to maintain the original pressure.

If the operator desires an equal pressure on both the fluke and the wheel at the same time, the connection between the bar H and yoke or arch G is made at the center of the latter; but if he desires a greater pressure on one than on the other the connection is made nearer to the side where the greater pressure is wanted.

The next feature of this drill is the trash-cleaner L, consisting of three or more curved tangential spokes or teeth, the hub of which is rigidly mounted upon a horizontal shaft, L′, which shaft is hung in front of the shoes or furrow-openers B by means of the hangers M, suspended from the side bars, A, at the two sides of the frame. Each hanger M is slotted at its lower end at *h*, for the purpose of receiving the shaft L′ and allowing vertical adjustment of the same.

The trash-cleaners, together with their shaft L′, are raised or lowered by a lever, P, which is pivoted or hung near its center to the side bar, A, of the main frame, and is secured at its front end to a horizontal bar or shaft, P′. The intermediate connections between this bar P′ and the shaft L′ at each end of the same consist of a rod, N, secured at its lower end to a small sleeve (not shown) encircling the shaft L′, and passing at its upper end through the end of the bar P′, and surrounded by a spiral spring, O, in all respects similar to the rods and springs which are above the fluke and covering-wheel.

The shaft L′, with its trash-cleaners, is rotated preferably by a belt or endless-chain connection with the axle or riding-wheel of the grain-drill.

If there is trash to be cleaned from the land, the handle end of the lever P is raised, and the shaft L′ and wheels L are thereby lowered to the ground, and the latter in rotating catch the trash and throw it lengthwise along the sides of the shoes or furrow-openers; but if the land is free from trash the lever P is depressed at its rear end, and this raises the shaft L′, with its wheels L, up into the slots in the hangers M. The spring O has the effect to adapt the trash cleaners to inequalities of the soil.

I do not wish to be confined to any particular construction and arrangement of the improved features of my drill, as changes could be made which would not alter the cardinal idea of my invention.

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

1. In a grain-drill, the combination, with the fluke and covering-wheel, of independent pressure-springs and an intermediate connection between said springs, substantially as and for the purpose set forth.

2. In a grain-drill, the combination, with the fluke and covering-wheel, of independent pressure-springs and an intermediate adjustable connection between said springs for regulating their tension, substantially as described.

3. In a grain-drill, the combination, with the fluke and covering-wheel, of independent pressure-springs, an adjustable connection between the two, and means for increasing the tension of one spring over that of the other, substantially as described, and for the purpose set forth.

4. In a grain-drill, the combination, with the fluke and covering-wheel, of independent vertical connecting-rods, surrounding spiral springs, an adjustable connecting-yoke, a horizontal bar having adjustable connection with said yoke, and means for raising and lowering said bar, substantially as described.

5. In a grain-drill, the combination, with the fluke and covering-wheel, of a pair of straight parallel bars supporting the wheel at their rear ends, and pivoted at their front ends only to the front of the fluke, substantially as described, shown, and for the purpose set forth.

6. In a grain-drill, the combination of a trash-cleaner arranged in front alongside each shoe or furrow-opener and an independent vertical spring exerting an adjustable pressure upon the same, substantially as described.

7. In a grain-drill, the combination of a trash-cleaner arranged in front alongside each shoe or furrow-opener, an independent vertical spring pressing upon the same, and a lever for adjusting the pressure of said spring, substantially as described.

8. In a grain-drill, the combination of a pair of slotted hangers, a shaft having bearings in the slots of said hangers, a series of trash-cleaners mounted on said shaft, an independent vertical rod and surrounding spring at each end of the shaft, and bearing upon the same, and a connecting-lever fulcrumed upon the main frame, substantially as described.

9. In a grain-drill, the combination of a pair of slotted hangers, a series of trash-cleaners mounted on a shaft having end bearings in the slots of said hangers, an independent vertical rod and surrounding spring at each end of said shaft, an upper horizontal connecting-bar, and a lever for elevating and depressing said bar, substantially as and for the purposes set forth.

In testimony whereof I affix my signature in presence of two witnesses.

WILLOUGHBY P. ELAM.

Witnesses:
MONROE M. CADY,
TONY BECK.