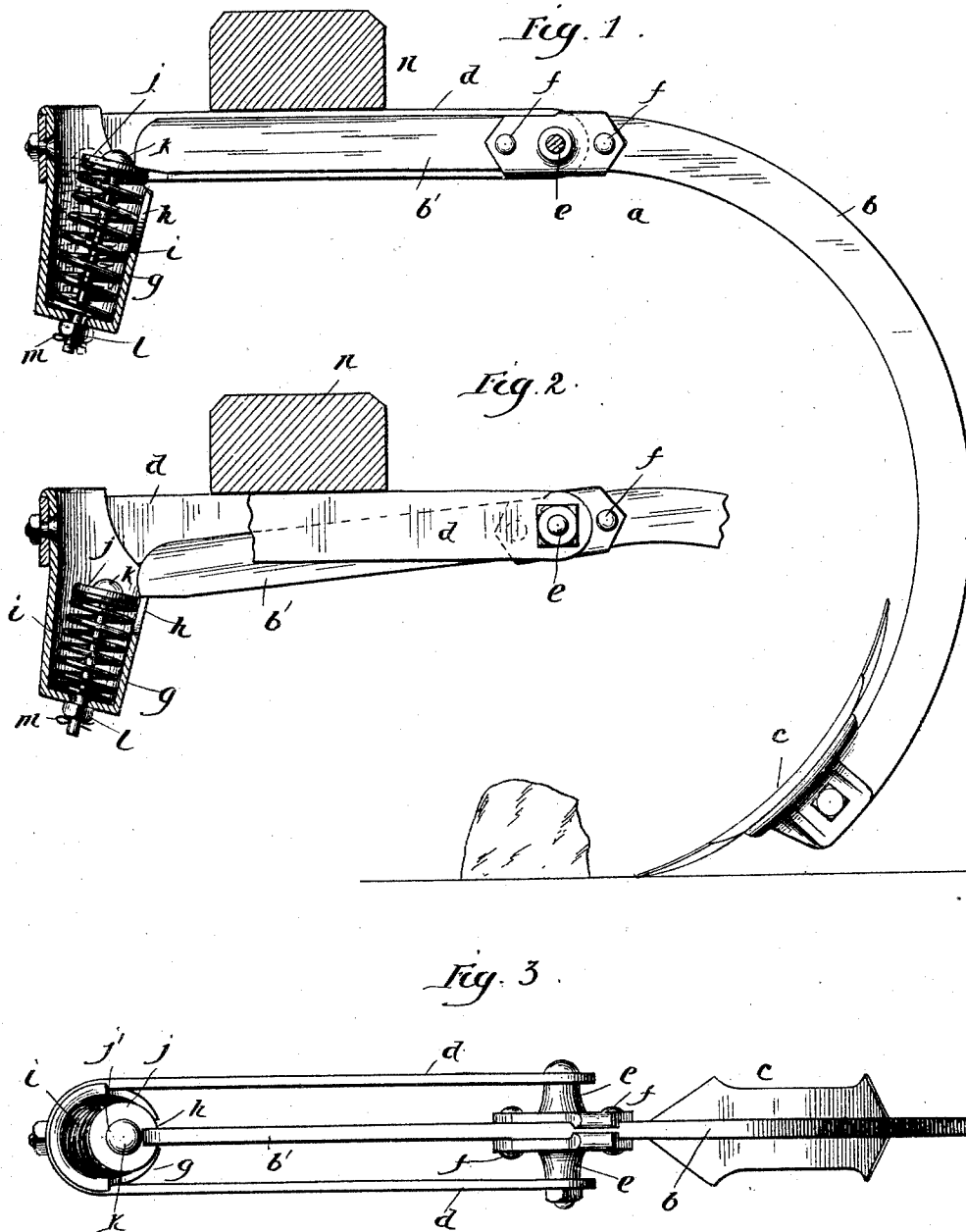


(No Model.)

G. MOORE.
SPRING TOOTH FOR CULTIVATORS.

No. 503,288.

Patented Aug. 15, 1893.



Witnesses:
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UNITED STATES PATENT OFFICE.

GILPIN MOORE, OF MOLINE, ILLINOIS, ASSIGNOR TO THE DEERE & COMPANY,
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SPRING-TOOTH FOR CULTIVATORS.

SPECIFICATION forming part of Letters Patent No. 503,288, dated August 15, 1893.

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To all whom it may concern:

Be it known that I, GILPIN MOORE, a citizen of the United States, residing at Moline, in the county of Rock Island and State of Illinois, have invented certain new and useful Improvements in Spring-Teeth for Cultivators and other Agricultural Implements, of which the following is a specification, reference being had to the accompanying drawings, in which—

Figure 1 is a side elevation of the tooth, the pocket which holds the spring being in section. Fig. 2 is a similar view of a portion of the tooth, showing the position of the parts when the tooth strikes an obstruction; and Fig. 3 is a top view, with the supporting cross beam removed.

My invention relates to spring teeth adapted to be used upon cultivators or other similar farming implements. Heretofore in the construction of spring teeth there have been two varieties: first, those in which the spring of the tooth is inherent in the tooth or shank itself and is due to its own elasticity; and second, those having a joint furnished with an adjustable spring lock, which permits temporary movement under favoring circumstances. In the former, the tooth, when drawn through the soil to be cultivated, has a vibratory or tremulous motion, which greatly aids in pulverizing. In the latter, the spring lock holds the tooth rigidly to its position when drawn through the soil, until an obstruction is met with. Then the spring is unlocked, permitting the lower part of the shank to bend backward and pass the obstruction when the spring returns the shank to its original position and it proceeds rigidly as before in its pathway through the earth.

It is to be noticed that the function performed by each class of teeth is different. In the first, a vibratory pulverizing is effected, which is entirely absent in the second class. In the second class, the character of the work done is exactly the same as has always been accomplished by the common form of rigid tooth implements, the spring lock simply being added as a safety device, to prevent bending or breaking the shank. It is evident that when a tooth of the first described class meets with an immovable obstacle unless the ma-

chine is stopped at once the tooth will be more or less straightened. If this straightening force is greater than the limit of elasticity of the tooth, the tooth will either be broken or permanently straightened, thereby destroying or impairing the utility of the implement. The usefulness therefore of both classes is limited, the first by the elasticity of the tooth and the second by its inability to perform vibratory pulverizing.

No elastic tooth machine has heretofore been made with a safety device to prevent injury to the tooth when a solid obstruction is met, and no rigid tooth machine has yet appeared capable of doing the work of the elastic shank implements.

The principal object of my invention is to avoid the objections common to spring teeth as heretofore constructed, which I accomplish by providing a tooth having a rigid shank, which is given a spring action by the action of a separate spring. Another object of my invention is to improve in general the construction and operation of spring teeth. I accomplish these objects as hereinafter specified and as illustrated in the drawings.

That which I regard as new will be pointed out in the claims.

In the drawings,—*a* indicates a spring tooth, which consists of a rigid shank *b* bent to a suitable shape, and carrying on its lower end a shovel *c*. The shovel *c* may be of any suitable pattern, and may be secured to the shank *b* in any desired manner, or be made integral therewith. The shank *b* is trunnioned near its upper end in a yoke *d*, by trunnions *e*, as best shown in Figs. 1 and 3, so as to swing in a vertical plane. The trunnions *e* are rigidly secured upon opposite sides of the shank *b* by rivets *f*, and are arranged so that they will fit closely upon the shank, as best shown in Fig. 3. At the inner end of the yoke *d* is rigidly secured a pocket *g*, which depends therefrom, as best shown in Figs. 1 and 2. The pocket *g* is of about the shape of a frustum of a cone, the smaller end being at the bottom; and the bottom is inclined, as shown.

z, indicates a coil spring, which is mounted in the pocket *g*. By constructing the pocket *g* in the shape of a frustum of a cone and inclining the bottom of the pocket, as described,

the spring will lie in an inclined position and next to the inner wall of the pocket, as best shown in Figs. 1 and 2. The upper end may thereby be pressed away from the inner wall,

5 for purposes which will appear hereinafter.

j, indicates a plate, which rests upon the upper end of the spring *i* and is held in place by means of a bolt *k* which passes downward through the spring *i* and the bottom of the

10 pocket *g*, and is secured in place by means of a washer *l* and a key *m*, or in any other suitable manner. The plate *j* is of about the size of the spring *i*, as shown in the drawings.

h, indicates a slot formed in the upper end

15 of the inner portion of the pocket *g*, for purposes which will appear hereinafter.

b', indicates a portion of the shank *b* which extends from the point at which the shank is

trunnioned, nearly to the other end of the

20 yoke *d*, its length being such that it will project a short distance beyond the inner edge of the pocket *g*. The extension *b'* is preferably formed integral with the main portion of the shank *b*, but it may consist of a separate

25 piece rigidly attached thereto. The arrangement is such that when the shovel *c* is lifted, the inner end of the extension *b'* will move downward through the slot *h*, as indicated in Fig. 2. The under side of the extension *b'* is

30 fitted at the end, to adapt it to bear squarely upon the plate *j*, and the upper portion of the end of the extension *b'* is rounded, as shown in Figs. 1 and 2.

n, indicates the cross beam of a cultivator

35 gang, to the under side of which the yoke *d* is secured by clips or other suitable devices, in such manner that the downward motion of the extension *b'* of the shank *b* will not be prevented.

40 The operation of my improved tooth is as follows:—The position of the various parts is normally as shown in Fig. 1, the extension *b'* lying then in a horizontal position, its end bearing upon the plate *j*. When the cultivator shovel strikes an obstruction, the shovel

45 *c* will be moved backward, when the extension *b'* will be thrown downward, compressing the spring *i* to the position shown in Fig. 2, when the extension *b'* will be clear of the

50 plate *j* and will move downward through the slot *h*, permitting the shovel *c* to be raised the necessary height to pass over the obstruction. When the obstruction has been passed and the cultivator beam is raised, the weight

55 of the shovel blade *c* aids in throwing the forward end of the extension *b'* in an upward direction into engagement with the spring pressed plate *j*, whereby the shovel *c* and the tooth *a* are returned to operative position by

60 gravity which is very desirable and materially simplifies the machine. The upward movement of the extension *b'* will be limited by the beam *n*, or by a suitable stop if the beam is omitted or elsewhere located. When

65 the cultivator is in operation, the action of the spring *i* upon the extension *b'* will give to the shovel a tremulous or vibratory mo-

tion, which will greatly aid in pulverizing the earth, substantially as is the case with spring

70 teeth in which the springiness is due to the inherent elasticity of the teeth. When the

shank *b* and extension *b'* are made integral

with each other, as hereinbefore suggested, instead of providing two separate trunnions *e*,

75 *e*, as shown in the drawings, a single pin passing through the shank and secured therein

may be used, in which case the arms or bars of the yoke *d* may be brought nearer together

than they are shown in Fig. 3. The rearward incline of the bottom of the pocket or

80 spring case *g* constantly tends to throw the upper end of the spring backward, so that when the forward extension of the tooth bar is brought up to position, the spring will

pass under it and will remain under it with-

85 out being jarred out of position.

One of the principal characteristics of my

improvement is the employment of a spring,

which will have all of the uses of a spring in

90 giving the tooth a vibratory action when in use, and in permitting the tooth bar to escape from the spring when under severe strain or

pressure. Other means than the tilting bottom to the box or case *g* may be used for

95 throwing the upper end of the spring under the end of the bar *b'*, such as a second spring, but the construction shown is that which I

prefer.

That which I claim as new, and desire to

100 secure by Letters Patent, is—

1. The combination with a pivoted tooth

shank, of a spring normally acting upon said

shank to hold it in an operative position and

to impart to it a tremulous motion when trav-

105 ersing the soil, said spring being adapted to be thrown out of operation under extraordinary

backward pressure upon said shank, substantially as described.

2. The combination with a pivoted tooth

shank, of a stop acting normally to hold said

110 shank in operative position and to be thrown out of operation to permit said shank to swing

under extraordinary backward pressure thereupon, said shank and stop being adapted to

115 return by the action of gravity into engagement with each other to bring said shank to its

operative position after the pressure is removed, substantially as described.

3. The combination with a yoke or support,

120 of a tooth shank *b* pivoted to the yoke or support and having the extension *b'* in front of its pivot, and a spring trip located beneath

the front end of the said extension for causing a tremulous motion of the tooth shank

and releasing the forward extension thereof

125 under extraordinary back pressure on said tooth shank, substantially as described.

4. The combination with a pivoted tooth

shank, of a spring trip located under the forward end of said shank in front of the pivot

130 thereof for holding the shank normally in operative position, said spring trip being moved out of engagement with the shank by extraordinary

back pressure on said shank and the

latter being returned by gravity to its normal position when the back pressure is removed, substantially as described.

5 5. The combination with a yoke and a rigid tooth shank pivotally mounted therein, and adapted to swing in a vertical plane, said shank having an extension b' , of a spring stop under said extension for holding the tooth in operative position under normal pressure, said
10 stop being adapted to be disengaged from said extension under extraordinary pressure to permit the tooth to swing freely, substantially as described.

15 6. The combination with the swinging shank b , having extension b' , of devices for supporting said shank, and a spring i under the end of the extension b' , the upper end of said spring being inclined toward said extension,

and being adapted to be pressed away therefrom, substantially as and for the purpose 20 specified.

7. The combination with the swinging shank b , having extension b' , of the yoke d , pocket g , having an inclined bottom and sides, slot h in said pocket, and spring i , substantially as 25 and for the purpose specified.

8. The combination with the swinging shank b , having extension b' , of the yoke d , pocket g , having an inclined bottom and sides, slot h in said pocket, spring i , plate j , rod k and key 30 m , substantially as and for the purposes specified.

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Witnesses:

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