GRIFFIN & CARPER.

Mole-Plow.

No. 27,285. Patented Feb. 28, 1860.

Fig. 1

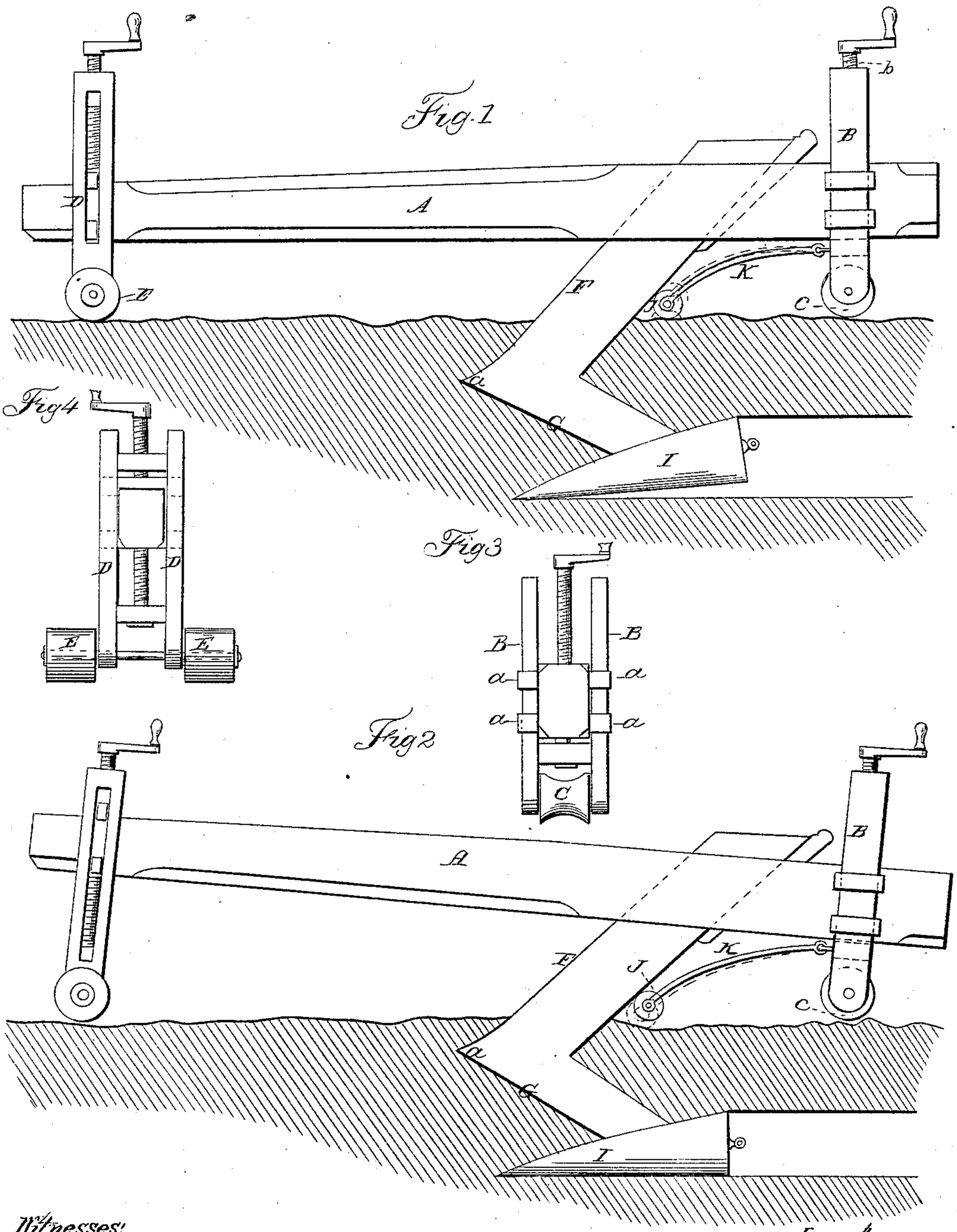

Fig 4

Fig 3

Fig 2

Witnesses;
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UNITED STATES PATENT OFFICE.

GEORGE L. GRIFFIN AND J. H. CARPER, OF DALLAS CITY, ILLINOIS.

IMPROVEMENT IN MOLE-PLOWS.

Specification forming part of Letters Patent No. **27,285**, dated February 28, 1860.

To all whom it may concern:

Be it known that we, GEORGE L. GRIFFIN and J. H. CARPER, of Dallas City, in the county of Hancock and State of Illinois, have invented certain new and useful Improvements in Mole-Plows for Forming Under-Drains, of which the following is a full, clear, and exact description, reference being had to the accompanying drawings, making part of this specification, in which—

Figure 1 represents a side elevation of an under-drain or mole plow embracing our improvements; Fig. 2 represents a similar elevation, showing the supports of the beam in the position they occupy when adjusted to form the drain with a descent. Fig. 3 represents an elevation of the rear end of the beam and its supporting-frame, and Fig. 4 represents an elevation of the front end of the beam and its adjustable support.

Among the most serious difficulties in the operation of forming under-drains is the great amount of power that is required to draw the mole through the earth, the loss of time thereby, and consequently greatly increasing the expense and rendering the operation too laborious.

To diminish the draft of the mole-plow, so that it can be worked with less power and with greater facility, is the object of one branch of our improvement; and it consists in constructing the sword (which connects the beam with the mole-plow) of an angular or pointed form, having its cutting-edge terminating in a point by the convergence of an advancing and receding angle in advance of and above the point of the mole, whereby the sword will be caused to penetrate and pass through the earth more easily than if it were straight. Moreover, this pointed sword braces and steadies the mole during the operation, because the two branches or angles receding from the point make a double oblique brace in the ground, and thus the single sword performs the duty and possesses the advantages of the colter and standard as heretofore combined.

In the accompanying drawings, A represents the beam, to the rear portion of which the sword that carries the mole is firmly secured. An adjusting-frame consisting of two uprights, B B and D D, is secured at each end of the beam, so as to be capable of vertical adjustment, by means of screws *b d*, swiveled to the frame beneath the beam and passing through a nut in the latter.

The rear adjusting-frame, B, carries a roller, C, which is made concave, and it also passes over the opening made by the sword, and thus renders it certain to be properly closed. The front adjusting-frame carries an axle with a roller, E, on each end, which serves to support the frame and this end of the beam. By these adjusting-frames the depth of the drain may be varied and made more or less inclined.

The sword consists of a single piece of wrought-iron made pointed, with its upper part, F, advancing from the beam and its lower part, G, receding from the point to the back of the mole, and the angles of the two meet in a point, *a*, in advance of the mole, and at such a distance above it that the point *a* of the sword shall always be below the surface of the ground. This construction of the sword, it will be seen, forms a double oblique brace to the mole in the soil and keeps the mole steady without the use of a double sword or colter and standard combined. The advantages of this angular-pointed sword over the straight ones are very important, inasmuch as by its use it is obvious that the draft of the machine will be greatly reduced, because the sword leads with its point easily piercing the soil, and the cutting-edges, rapidly retreating from the point, sever the soil with comparatively little or no resistance. Moreover, by this angular sword no colter or independent leading-cutter is necessary.

The mole I is of the usual form, being flat on its under side, convex on its top and sides, and pointed, with its back or top rising from the point with a gradual curve to the rear end. Its flat portion determines the bottom of the ditch or drain and its sides and top the walls or arch thereof. A follower having a transverse depression in the middle of its length may be connected flexibly to the rear of the mole.

The second part of our improvement is for the purpose of closing the opening made by the sword in the surface of the soil more effectually than has hitherto been done, to prevent the water running into the drain from the

outside; and as under-drains are frequently choked and closed up from this cause, it is found necessary to employ a man to follow the machine and close the opening, so imperfect are the devices of the machines hitherto employed to accomplish it.

The inclined rear edge of the upper branch, F, of the sword, it will be seen, forms an obtuse angle with the surface of the ground, and in the apex of this angle we have arranged the closing-roller J, mounted so as to turn on its axis in the front end of a spring arm or reach, K, whose rear end may be hinged or otherwise secured to the adjusting-frame B or under side of the beam A.

The spring-reach consists of a curved plate of tempered steel, and should be of such length that when the mole has reached the depth of the intended drain the reach or arm will be compressed in the direction of its length, and the tendency therefore of the roller J is constantly to press forward; but as it is arrested against the inclined back of the sword the compressed force of the spring is directed downward and holds the roller firmly upon the ground.

In addition to the pressure of the spring, it will be observed that the back of the sword holds the roller down and only allows it to rise against the increased compression of the spring-reach, as shown by red lines in Fig. 1, so that while the roller may rise to pass over stones, hillocks, and other obstructions, it will be always pressed by the conjoint action of the spring and inclined back of the sword upon the soil with sufficient force to close the opening effectually. Crossing hollows or depressions does not interfere with the action of the roller or the joint action of the sword, as the compressed force of the spring always crowds it into the apex of the angle formed by the sword and surface of the ground, as shown by red lines in Fig. 2.

The roller is made concave, or of two cones with their apices united together directly over the openings in the ground; or it may be of any other proper shape suitable for the purpose.

The spring-arm should be made sufficiently strong and elastic to insure its proper action, and also of such length that it may have the requisite degree of compressed force as it extends forward beneath the inclined back of the sword.

Our machine is operated by horse-power provided with a windlass and rope or chain, by which it is connected to the front end of the beam.

The mole may be adjusted to cut a drain from a depth of fourteen inches to five feet below the surface of the ground, and it is obvious that the supporting-rollers may be adjusted so as to cause the mole to form the drain parallel or thereabout to the surface of the ground, or to accord with an inclination having a decent of about three feet and a length of about ten rods over rough and uneven ground.

What we claim as our improvement is—

Constructing the sword with an advancing and receding angle, which converge in a point in advance of the point of the mole and directly above it, in combination with said mole, in the manner and for the purposes herein fully described.

In testimony whereof we have hereunto signed our names.

GEORGE L. GRIFFIN.
J. H. CARPER.

Witnesses:
L. H. DOTY,
HENRY F. BLACK.