

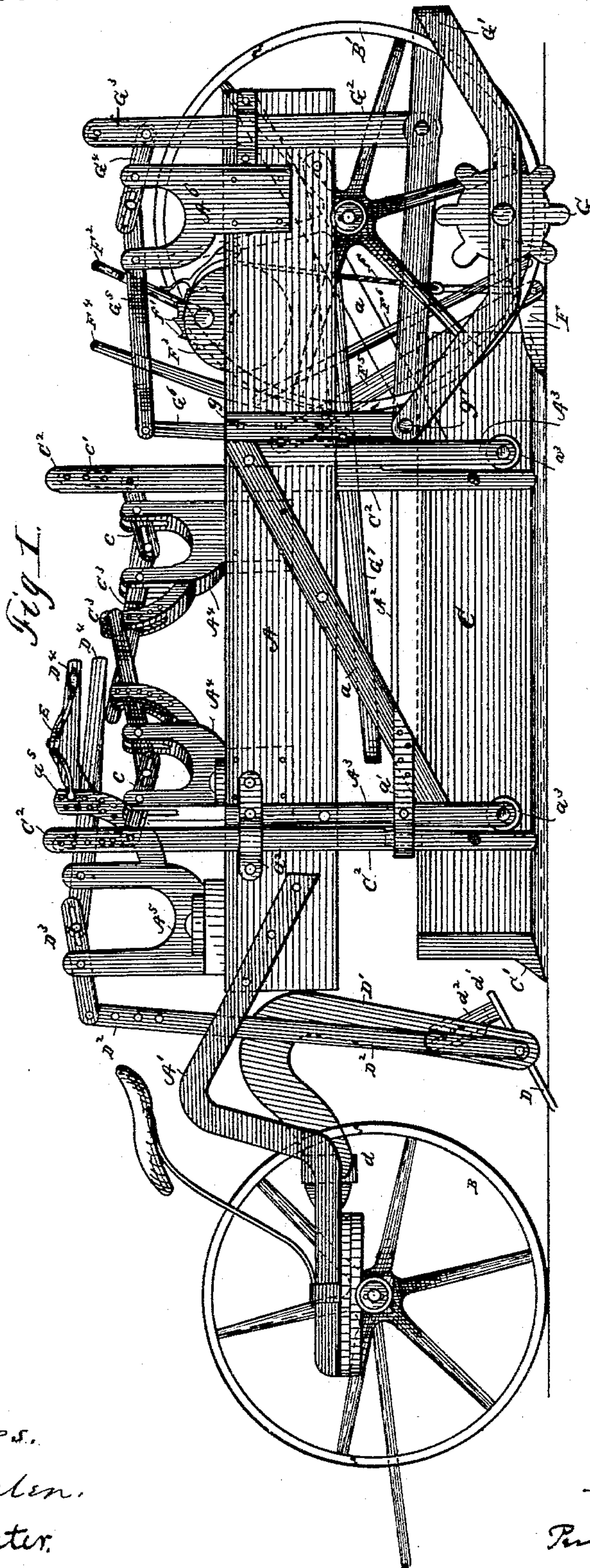
(No Model.)

3 Sheets—Sheet 1.

P. B. SHELDON.
GRADING MACHINE.

No. 323,536.

Patented Aug. 4, 1885.



Witnesses.
W. R. Edelen.
Robt. H. Porter.

Inventor
P. B. Sheldon
Per Hallok & Hallok
Att'ys

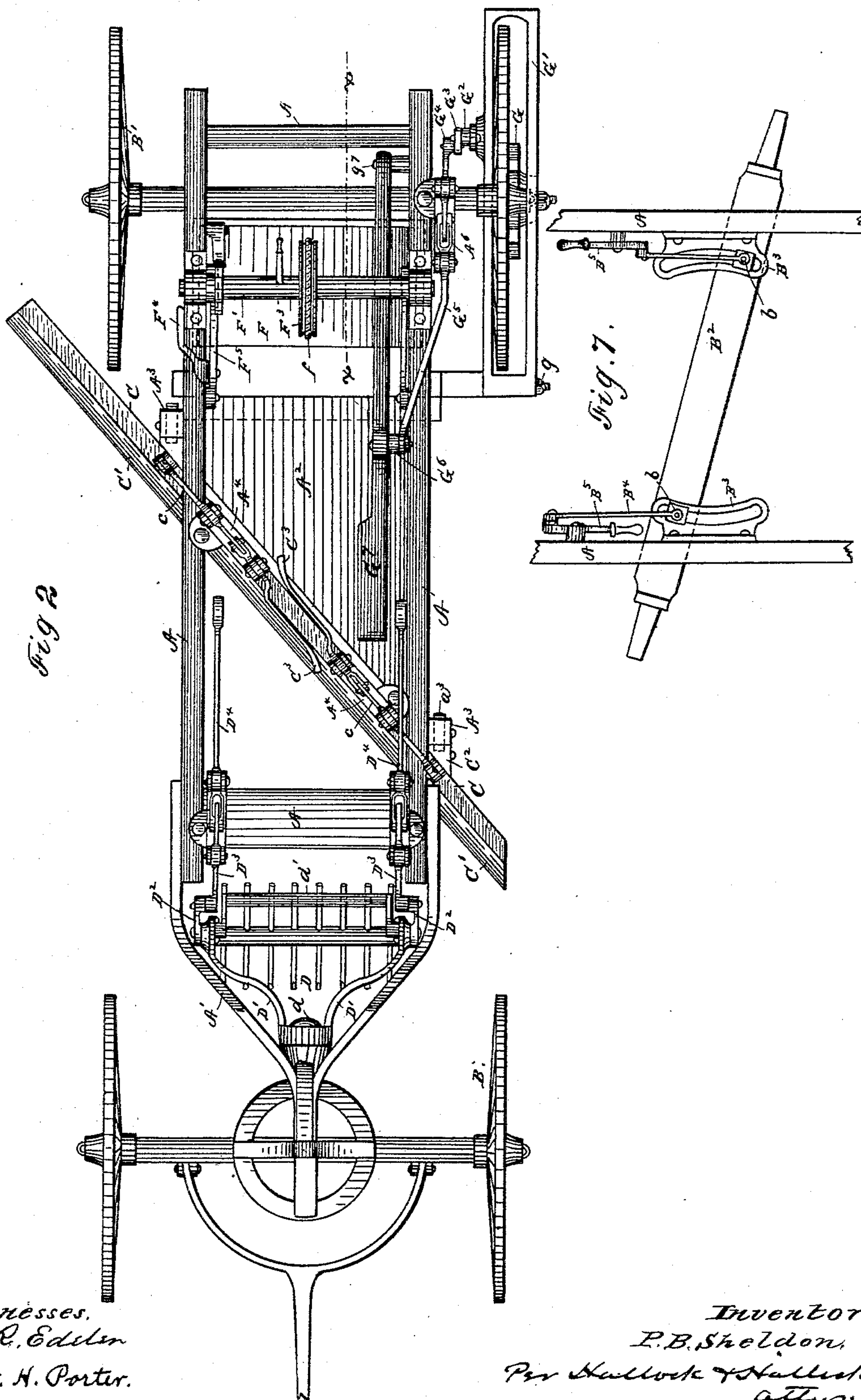
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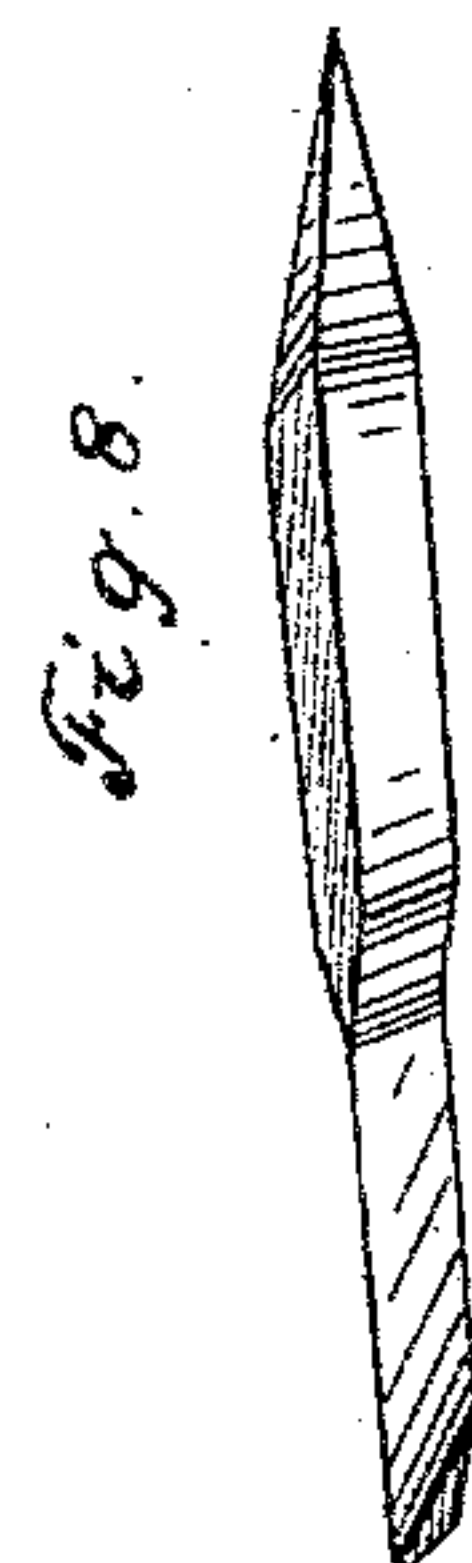
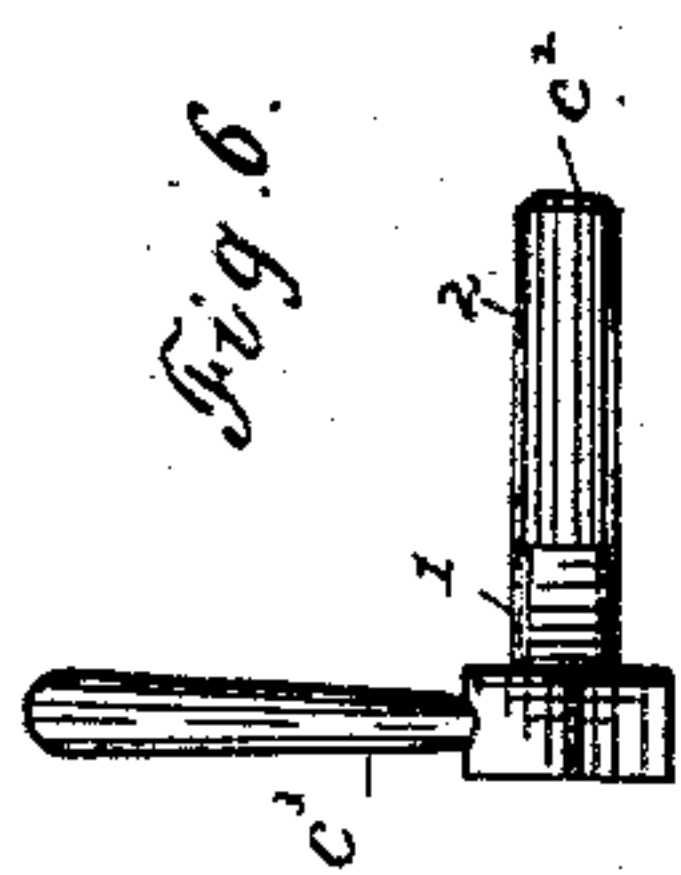
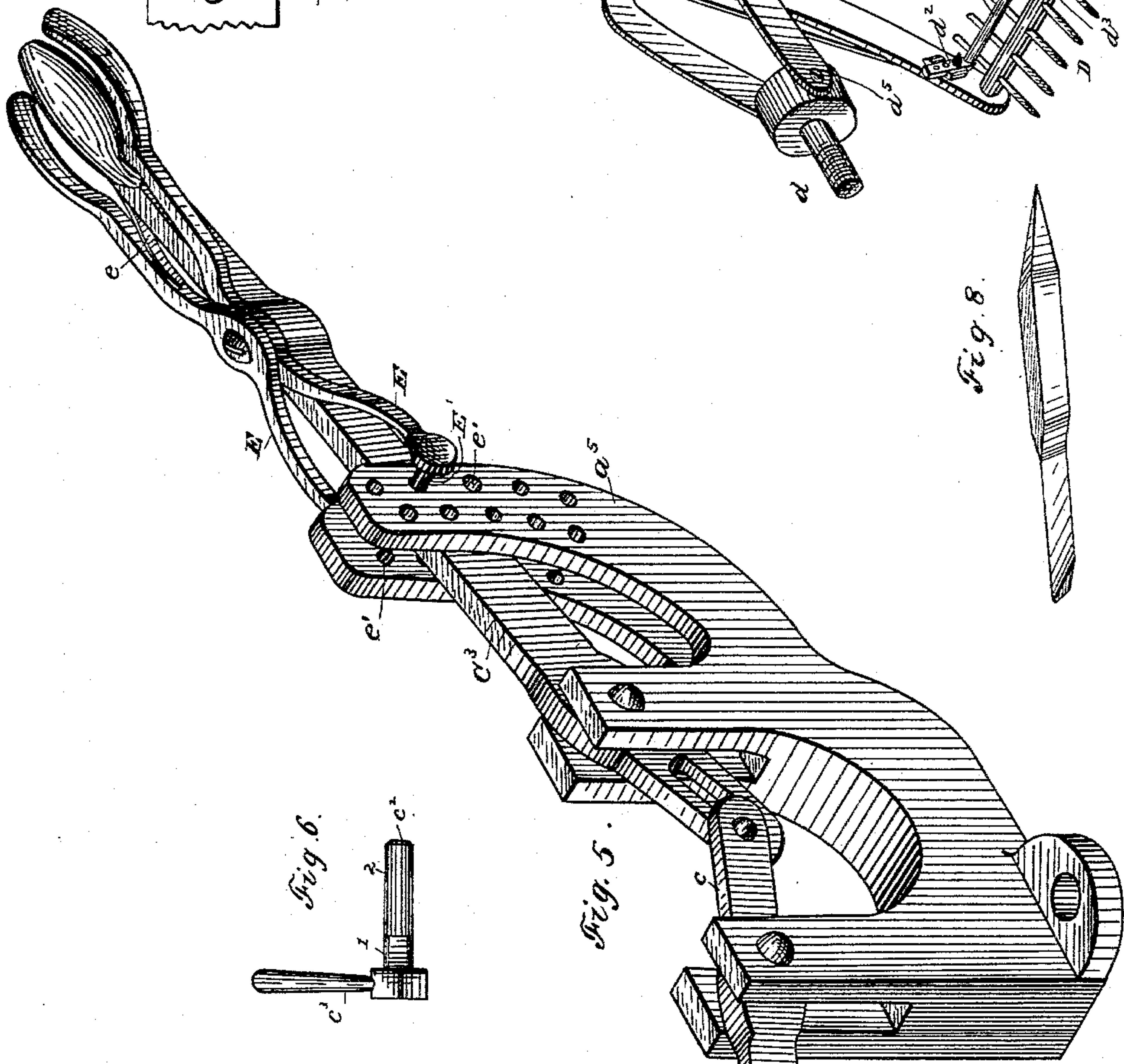
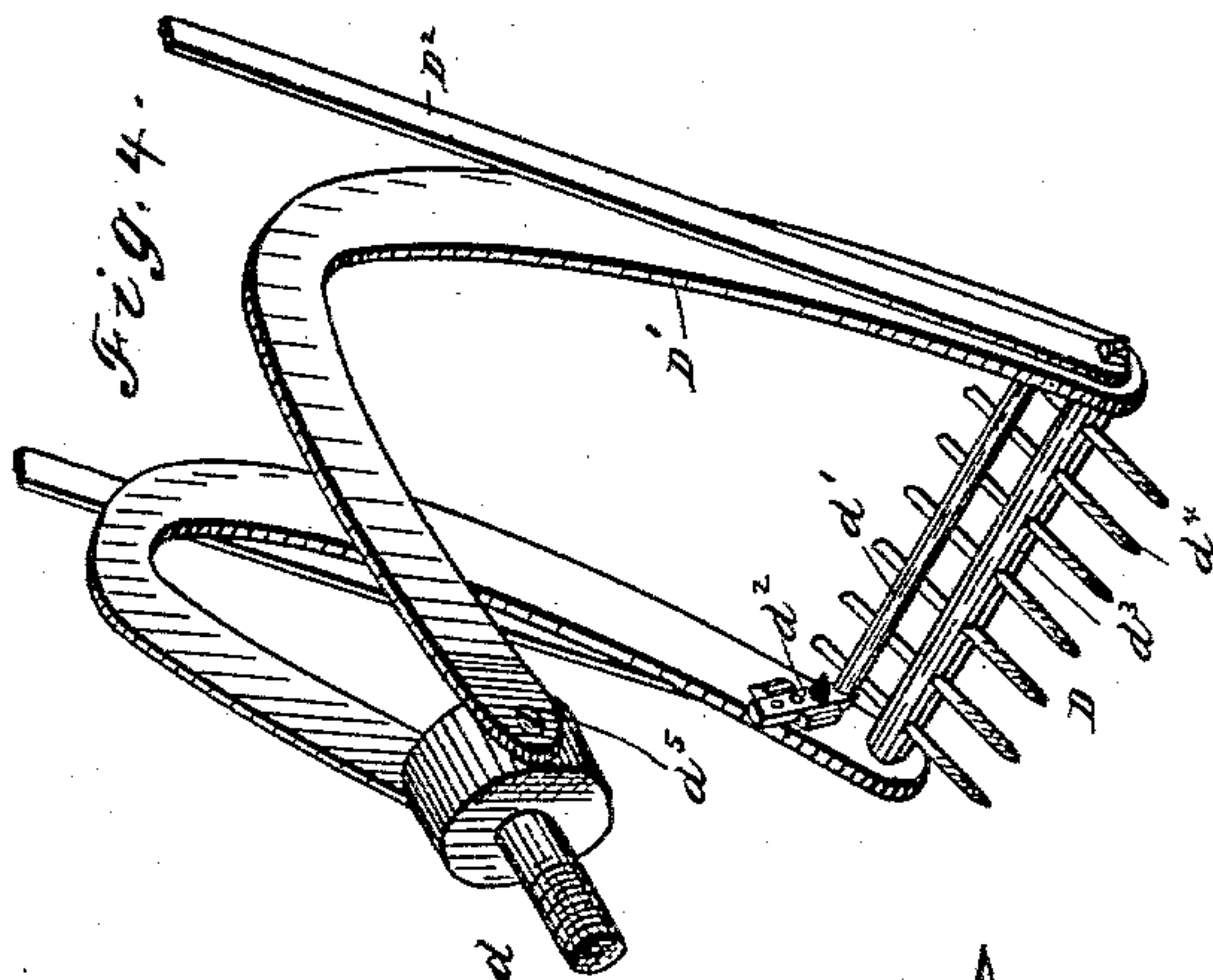
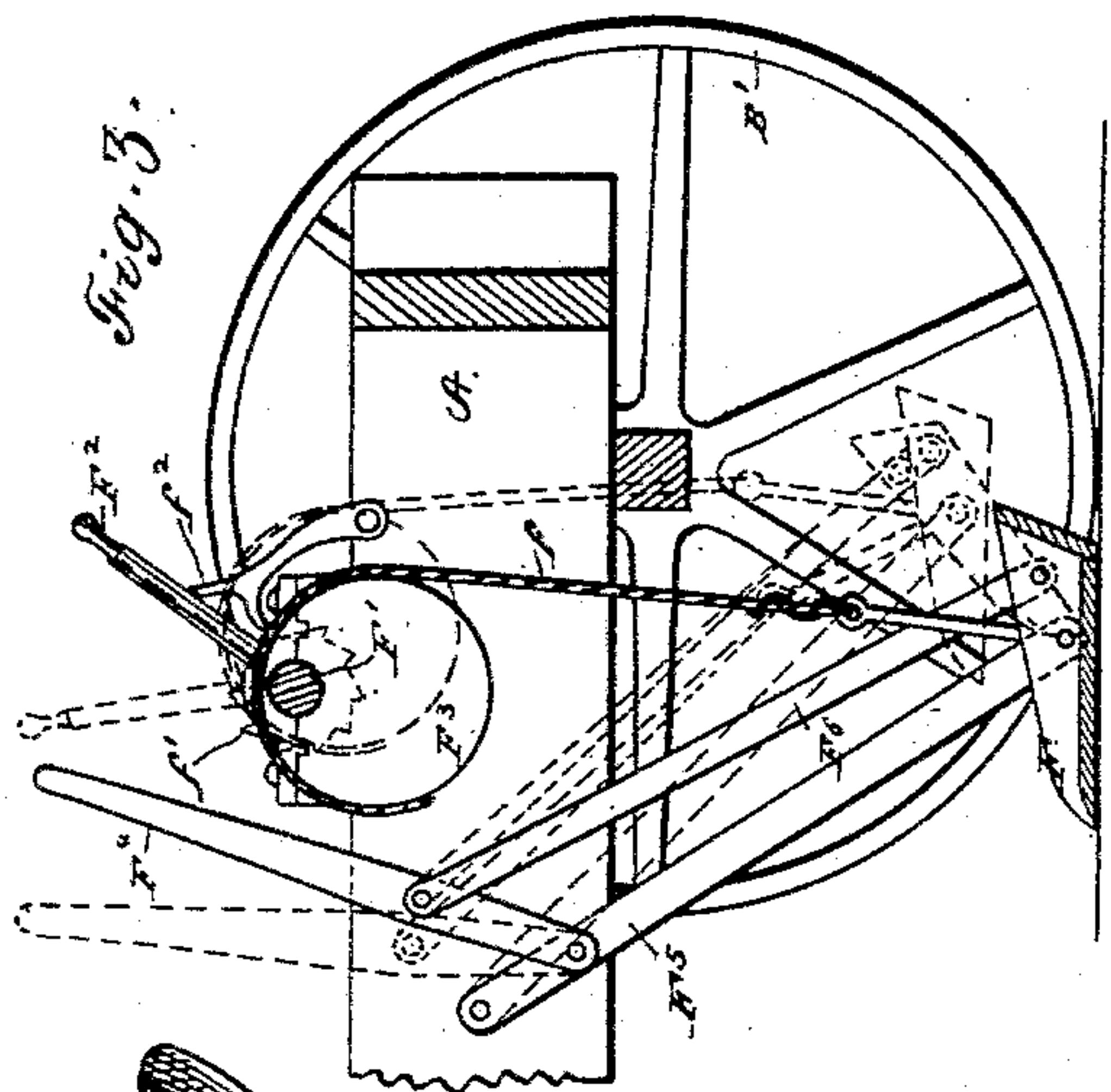
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Att'y

UNITED STATES PATENT OFFICE.

. PHILO B. SHELDON, OF ERIE, PENNSYLVANIA.

GRADING-MACHINE.

SPECIFICATION forming part of Letters Patent No. 323,536, dated August 4, 1885.

Application filed December 5, 1884. (No model.)

To all whom it may concern:

Be it known that I, PHILO B. SHELDON, a citizen of the United States, residing at Erie, in the county of Erie and State of Pennsylvania, have invented certain new and useful Improvements in Grading-Machines; and I do hereby declare the following to be a full, clear, and exact description of the invention, such as will enable others skilled in the art to which it appertains to make and use the same.

This invention relates to improvements in that class of earth-grading machines in which the scrapers are carried by a frame-work mounted on wheels.

The objects, purposes, and scope of the invention will fully appear in the following description, and be pointed out in the claims.

The device is illustrated in the accompanying drawings as follows: Figure 1 is a side elevation. Fig. 2 is a top or plan view. Fig. 3 is a vertical section on the line *xx* in Fig. 2. Fig. 4 is a perspective view of the scarifier detached from the machine. Fig. 5 is a perspective view showing in detail the construction of the levers by which the scrapers or scarifier are adjusted. Fig. 6 shows the bolt *e* in detail. Fig. 7 is a plan view of the rear axle and means for turning it, if desired. Fig. 8 is a detailed view of a scarifier-tooth.

The principal parts of the machine are indicated by letters of reference, as follows: A A' mark the frame-work, of which A is the wooden part and A' is an iron arched frame-work, which is connected with the upper part of the fifth-wheel. A² is the operator's platform. A³ A³ are stay-posts braced by the braces *a a*. *a' a'* are guide-loops for guiding the posts C² of the scraper C. B B' are the wheels. C is the scraper-bar, and C' the scraper-blade. C² C² are the posts or handles of the scraper-bar. C³ C³ are the hand-levers by which the scraper is adjusted in proper position vertically. D is the scarifier; D', the scarifier-frame; D² D³ D⁴ the levers and gearing by which the scarifier is adjusted properly. F is a gathering or transporting scraper hung between the hind wheels. F¹ F² F³ is the gearing for lifting the scraper F. F⁴ F⁵ F⁶ are levers for regulating the pitch or angle of the scraper F and dumping it when elevated. G is a spur-wheel, which may be forced

into the earth to prevent the rear wheel from slewing out of line when the scraper C is in action. G' is a frame carrying the spur-wheel. G², G³, G⁴, G⁵, G⁶, and G⁷ is the leverage by which the spur-wheel is operated.

The letters indicating other parts will appear in proper place in the following description of the construction and operation of my machine.

The state of the art to which my invention relates is exemplified by the following Letters Patent: No. 37,829, to G. W. Sayre, March 3, 1863; No. 139,099, to L. P. Wright, May 20, 1873; No. 160,535, to McCall *et al.*, March 9, 1875; No. 187,467, to H. D. Janes, February 20, 1877; No. 191,728, to L. F. Jefferson, May 29, 1877; No. 206,943, to S. Griffin, August 13, 1878, and No. 278,296, to G. H. Waldo, May 22, 1883.

From the above-named patents it will be seen that it is common to use a scraper-bar, C, and to suspend it from a frame-work which is mounted on wheels, and provide means for adjusting it vertically; that it is also common to provide a scarifier in front of the scraper-bar and make the same adjustable vertically, and it will also be seen that it is common to provide means for preventing the rear wheels from slewing. I shall therefore not claim as my invention the aforesaid features broadly as such.

My invention consists, first, in improvements in the means for moving the scraper-bar vertically and holding it in place when adjusted; second, in improvements in the construction and adjustment of the scarifier; third, in the construction, adjustment, and means for operating a conveying-scraper; fourth, in the construction, adjustment, and means for operating the spur which prevents the rear wheels from slewing; and, fifth, in providing means for setting the rear wheels at an angle to the line of draft of the machine for the same purpose.

In operating the machine the scraper C has to be kept forced down constantly against the earth. This especially is the case where it is being used in clearing streets of ice and hard-packed snow, and also when the earth is hard and refractory. To effect this easily it is necessary to continually apply power to the levers which move the scraper C vertically, and

to effect this easily it is desirable that the levers be so constructed that by depressing them the scraper will be depressed, and then the operator can apply his weight to do the work.

5 The same may also be said of the scarifier and the spur G. I have therefore provided double or jointed levers and properly-formed brackets, such as A^4 , to pivot these levers. These brackets are forked, and the two parts of the
10 levers—such as C^3 and c or D^3 and D^4 or G^4 and G^5 —are severally pivoted or fulcrumed in the arms of the forks, and the joint connecting them is below the arms.

In many uses of the machine it is necessary
15 that the scraper-bar be adjusted to a certain position and kept there without deviation, so that the grading accomplished shall be uniform. To effect this result perfectly it is desirable that the levers be locked or fastened
20 when in a proper position. I accomplish this purpose by providing the brackets above referred to with arms a^5 , (see Fig. 5,) which reach back from the fulcrum of the hand-levers some distance, and in them I put bolt-holes
25 e' , into which a stop-bolt, E' , can be placed to hold the lever at any point. (Of course in place of the bolt-holes and stop-bolt a pawl-and-ratchet construction can be used.) In
30 Fig. 5, and on the lever D^4 in Fig. 1, I show the bolt E' as operated by a hand-grip lever, E , and there are also shown two of the levers and bolts, one on each side of the arm a^5 . The bolt-holes on one side alternate in position with those on the other side, so that close ad-
35 justment can be had without having the holes too frequent.

The leverage $C^3 c$, which moves the scraper-bar vertically, does not connect directly with the parts C^2 ; but a link, c' , is interposed. This
40 link or the post C^2 , or both, are provided with a series of bolt-holes, c^4 , so as to make adjustments, and the series of bolt-holes in either the link or the post are connected by slots c^5 ; and the bolt c^2 is made with a flattened space,
45 1, and round space 2, so that by properly turning the bolt c^2 it can be made to slip from one bolt-hole to another without having to be drawn out. This device—to wit, the bolt with a flattened space and the slots connecting the
50 holes—is not new as an adjusting means, simply, as it is found in other devices, and I shall therefore not claim it broadly as part of my invention. The lever c^3 is for the purpose of turning the bolt for the purpose of bringing
55 the flat part in position to slip through the slot or not, as desired.

The scarifier consists of a bar or shaft, d^3 , with teeth-bars d^4 protruding from it in opposite directions. These teeth-bars are sharp-
60 ened at one end, like a knife or colter, and at the other they are beveled somewhat like a chisel, or sharpened like a drag-tooth, if desired. The shaft d^3 is hung in the frame-work D' , so it can turn over, and thus present either
65 line of points, if desired. It is prevented from turning when at work by a stop-bar, d' , which is adjustable in slides d^2 , so as to regulate the

angle or pitch of the teeth when at work. The frame D' is swiveled at d in the fork of the frame A' , where it connects with the
70 frame A' , and is jointed at d^5 , and by the leverage $D^2 D^3 D^4$, on either side, the scarifier can be raised up off the earth or be raised at one end and lowered at the other, as desired.

The carrying or transferring scraper-bowl
75 F is placed back of the bar-scraper, and when it is used the bar-scraper may be raised up, so as to not touch the earth. It will be used to gather up earth in high places and transport it to low places. It is in form substantially like an ordinary scoop road-scraper.
80 When not in use it hangs suspended, as shown by dotted lines in Fig. 3. It is sustained by the rope or chain f , and is raised or lowered by the winch $F' F^2 F^3$. The drum F^3 of the
85 winch is eccentrically arranged, so as to work rapidly. A pawl and ratchet, $f' f^2$, is employed on the winch, as commonly. The scraper F is adjusted as to its incline toward the earth by the levers $F^4 F^5 F^6$, and when it
90 is raised up it can be dumped by the same levers.

When desired, the bar-scraper and the transporting-scraper can both work in conjunction. This can be done by elevating the
95 heel of the bar-scraper and depressing the point, so that it will act like a plow and throw a furrow up about midway of its length, which will be in the line of the scraper F , which will gather it up, and when the scraper F is
100 filled the operator will throw the point of the bar-scraper up out of the earth, and the machine will be driven to the dumping-place.

When the bar-scraper is working in the refractory earth or in clearing up icy streets, the
105 pressure upon it tends to slew the hind wheels, B' . To prevent this the spur G is provided. It is placed on the land-side of the machine, by the side of the rear wheel. This spur is shown as a spurred or toothed wheel; but it
110 may be a plain disk-wheel or a fixed blade as well. I do not desire to be limited in this respect, as my invention in this particular relates more to the means for operating the device than to the form of it. It is adjustable
115 on a frame, G' , which surrounds the wheel, and is pivoted on a fixed standard, g , at g' . The spur is preferably placed on the outside of the wheel, opposite its bearing on the earth. The spur is operated by a foot-lever, G^7 , which
120 extends to the operator's stand A^2 , and is connected with the frame G' by the levers and rods G^6, G^5, G^4, G^3 , and G^2 . I do not wish to be limited to the use of this device on one of the hind wheels only, for it may be used on
125 both and on all the wheels, both fore and rear, or not, as desired. If it is used inside the wheels, the frame G' need not surround the wheel.

Another method of preventing slewing of
130 the rear wheels is to provide means for setting them at an angle to the line of draft of the machine. This method may be used in conjunction with the spur, also, if desired.

In Fig. 7 I show means for setting the rear axle at an angle to the frame A. It consists in providing brackets B³ on the sides of the frame A, which have curved slots, through which bolts or pins b extend from the axle B². These bolts may have nuts on them by which they can be set in the slot at any point desired, or they may be connected with adjusting-levers B⁵ by links B⁴, as shown.

What I claim as new is—

1. In a grading-machine having a scraper-bar suspended below a carrying-frame, the combination, with the lifting-posts connected with said scraper-bar, of the jointed levers C³ c and the forked fulcrum-brackets A⁴, as and for the purposes set forth.

2. In a grading-machine having a scraper-bar suspended below a carrying-frame, the combination, with the lifting-posts connected with said scraper-bar, of the jointed levers C³ c and the forked fulcrum-brackets A⁴ with arms a⁵, as and for the purposes set forth.

3. In a grading-machine having a scraper-bar supported by a carrying-frame, the combination, with the lifting-posts connected with said scraper-bar and the levers by which said posts are lifted, of the series of adjusting bolt-holes c⁴ with connecting slots c⁵, and the bolt c² with flattened space 1 and rounded space 2, as and for the purposes set forth.

4. In a grading-machine of the class herein shown, the combination, substantially as set forth, of a vertically-adjustable scraper-bar and a scarifier arranged in advance of said scraper, which is supported by a frame which is both swiveled and pivoted, as at d and d⁵, so as to permit of both a tilting and a vertical movement, as set forth.

5. In a grading machine of the class herein shown, the combination, substantially as set forth, of the frame A, the arched front frame, A', the scarifier-frame D', swiveled within the fork of the frame A', the lifting-bars D², and means, substantially as shown, for actuating said lifting-bars.

6. In a grading-machine of the class herein shown, the combination, substantially as set forth, of a vertically-adjustable scarifier, a vertically-adjustable scraper-bar, and a vertically-adjustable conveying scoop-scraper.

7. In a grading-machine scarifier, the combination, substantially as set forth, with a frame vertically adjustable on the main frame, of the reversible bar d³, the oppositely-projecting teeth d⁴, a supporting-frame, and an adjustable stop for regulating the angle of incline of said teeth.

8. In a grading-machine of the class herein shown, the combination, substantially as set forth, of a vertically-adjustable and laterally-tilting scarifier, a vertically-adjustable and obliquely-arranged scraper-bar, and a vertically-adjustable conveying and dumping scraper-bowl.

9. In a grading-machine of the class herein shown, the combination, substantially as set forth, of a vertically-adjustable obliquely-arranged bar-scraper, and a vertically-adjustable tilting and dumping conveyer scraper-bowl.

10. In a grading-machine of the class herein shown, the combination of the scraper F, the winch F' F² F³, the supporting chain or rope f, and the tilting and dumping levers F⁴, F⁵, and F⁶, as set forth.

11. In a grading-machine of the class herein shown, the combination, substantially as set forth, of the spur G, frame G', and leverage-gearing G², G³, G⁴, G⁵, G⁶, and G⁷.

12. In a grading-machine of the class herein shown, the combination, with the rear axle and the frame A, of the attaching-brackets B³, with curved slots, and the bolts b, adjustable within said slots, as and for the purposes mentioned.

13. In a grading-machine of the class herein shown, the combination, with the rear axle and the frame A, of the brackets B³ with curved slots, the bolt b, the links B⁴, and levers B⁵, as shown, and for the purposes set forth.

14. In a grading-machine of the class herein described, the combination of an obliquely-arranged scraper-bar, a spur to prevent the wheels from slewing, which consists of a revolving wheel or disk arranged, as shown, to enter the earth by the side of the wheel opposite its tread, and levers for moving said spur vertically from the operator's stand.

15. In a grading-machine of the class herein described, the combination, substantially as set forth, of an obliquely-arranged scraper-bar and a spur to prevent slewing of the wheels while the scraper is in action, which is adjusted, substantially as set forth, to enter the earth by the side of the wheel opposite its tread.

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

PHILO B. SHELDON.

Witnesses:

JNO. K. HALLOCK,
ROBT. H. PORTER.