

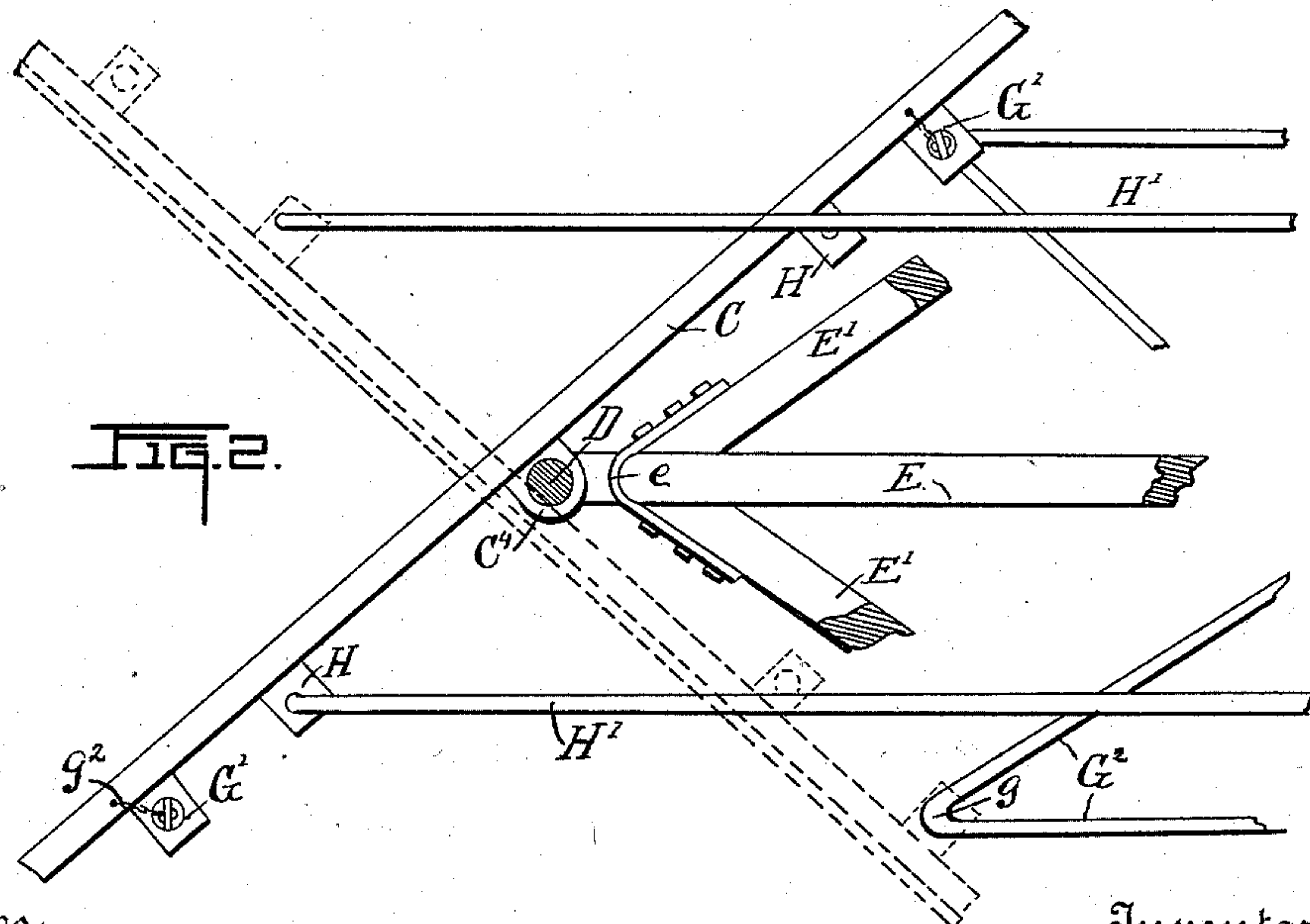
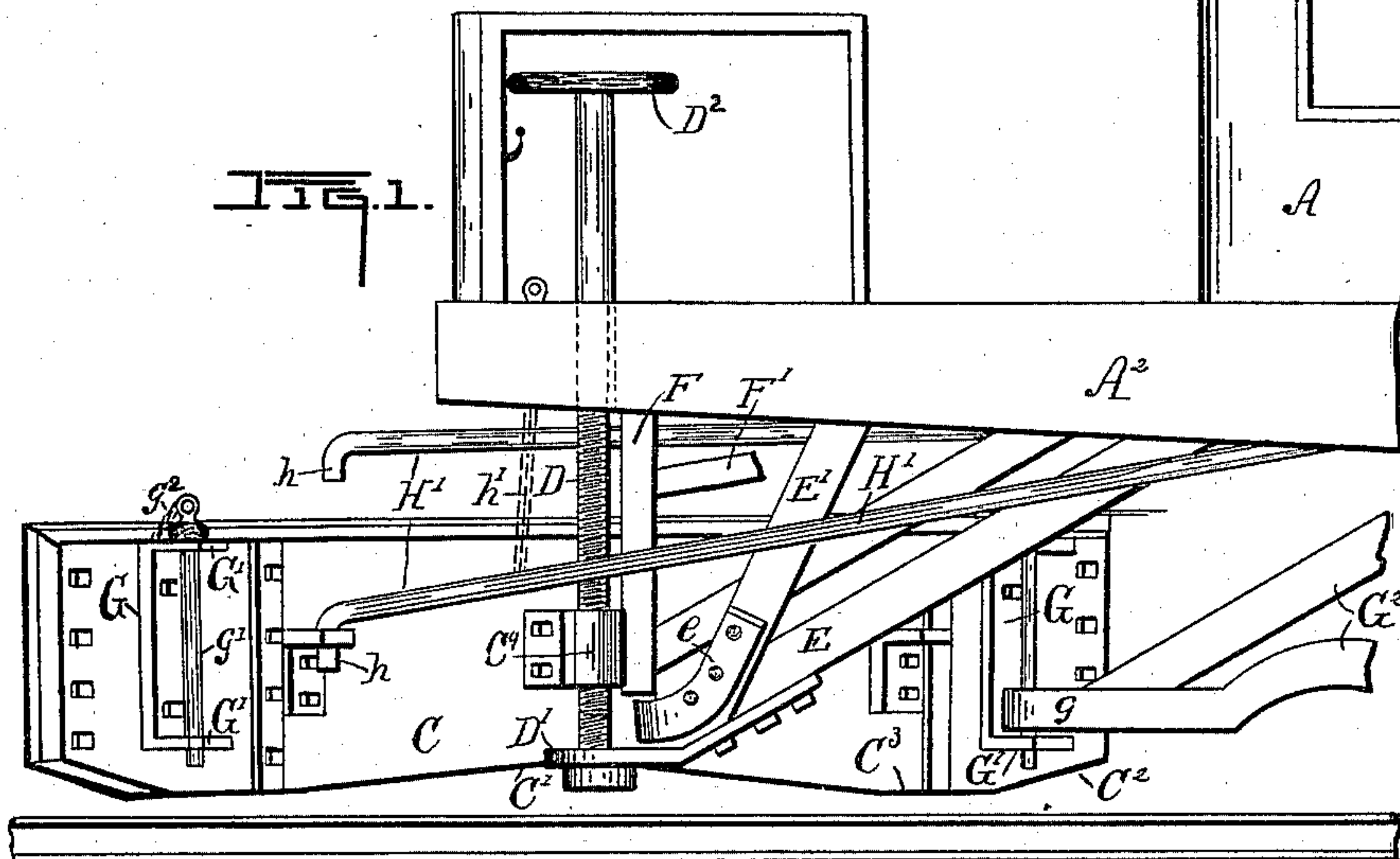
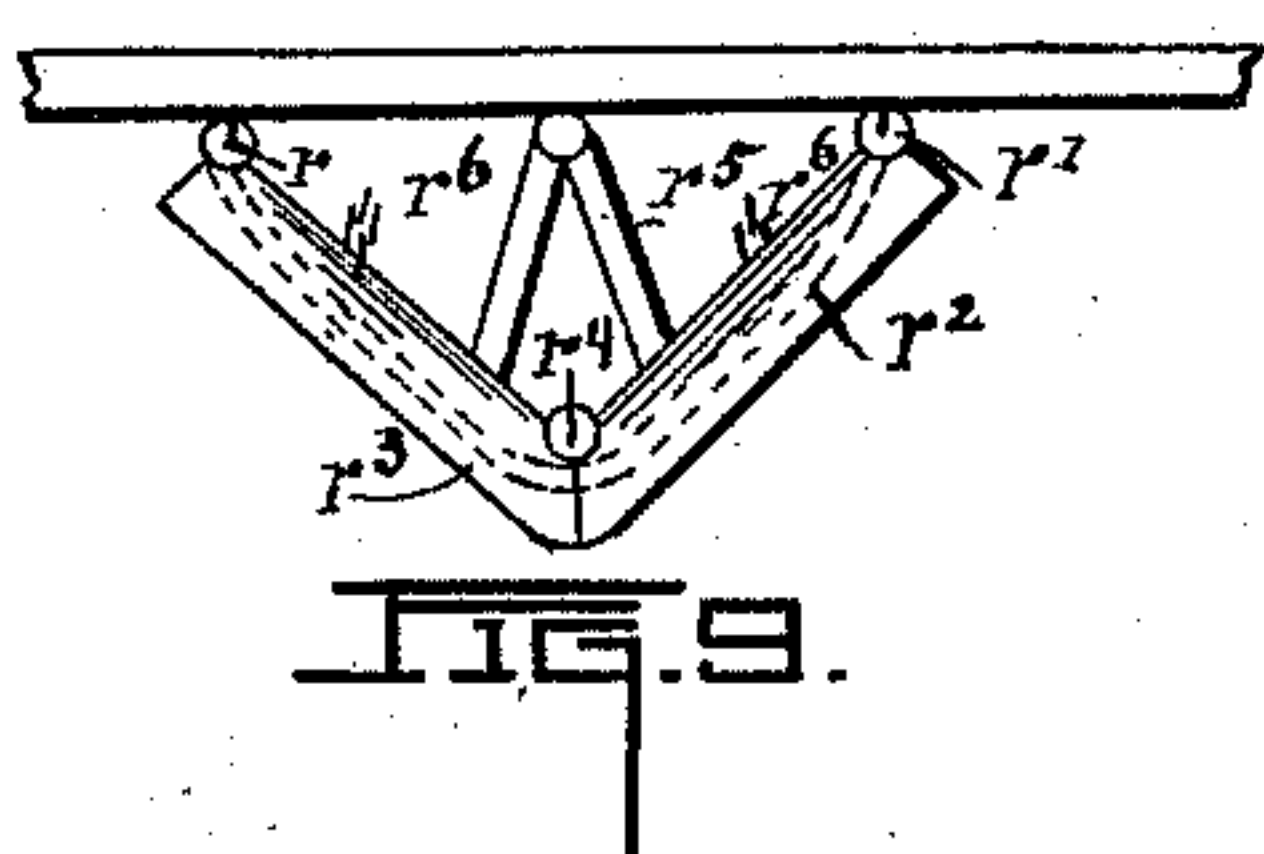
(No Model.)

4 Sheets—Sheet 1.

W. J. TREMPER, C. V. ROTE & W. A. ARMSTRONG.  
SNOW PLOW.

No. 540,284.

Patented June 4, 1895.



Witnesses  
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A. B. Hambright

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By Attorney  
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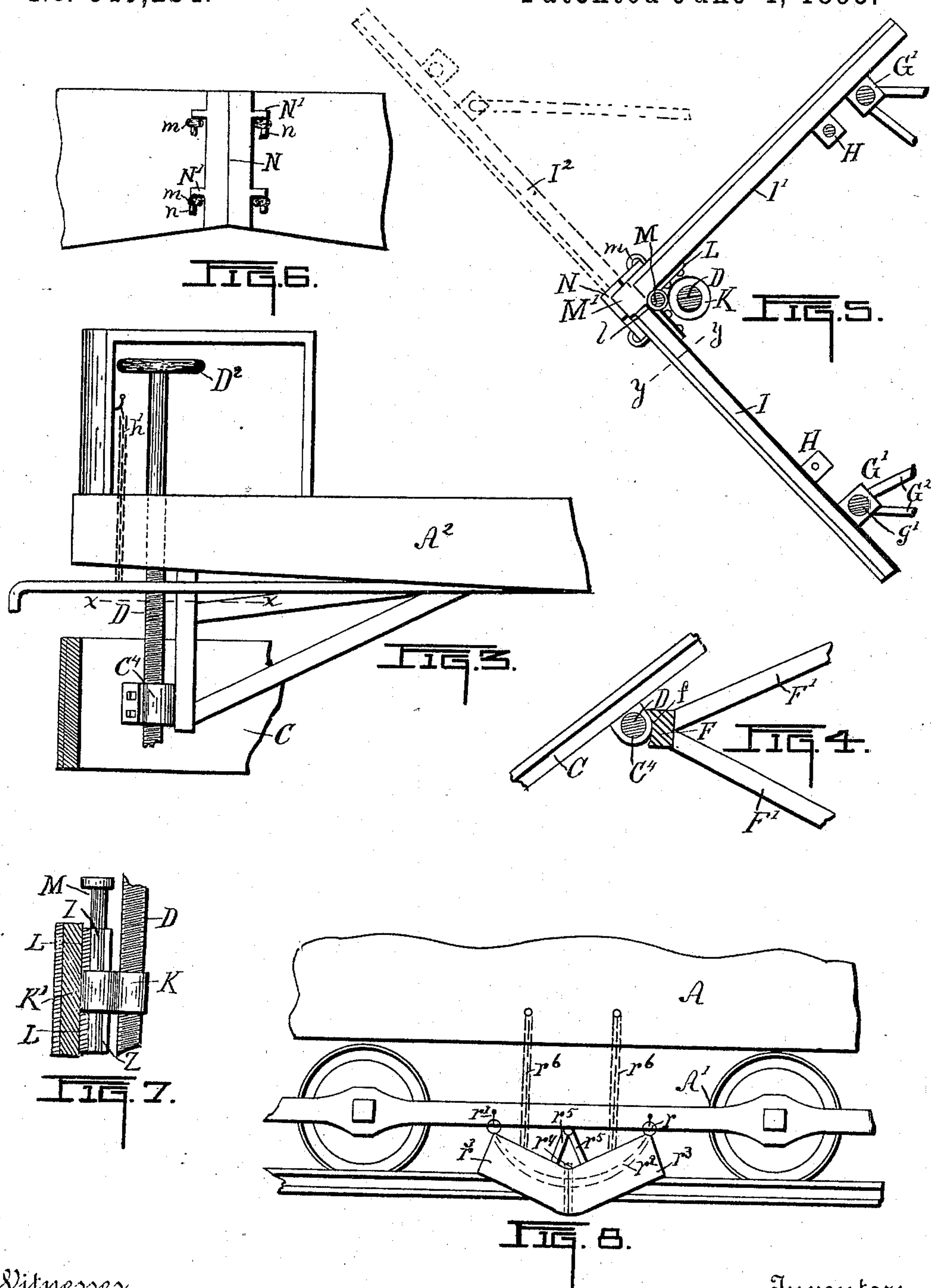
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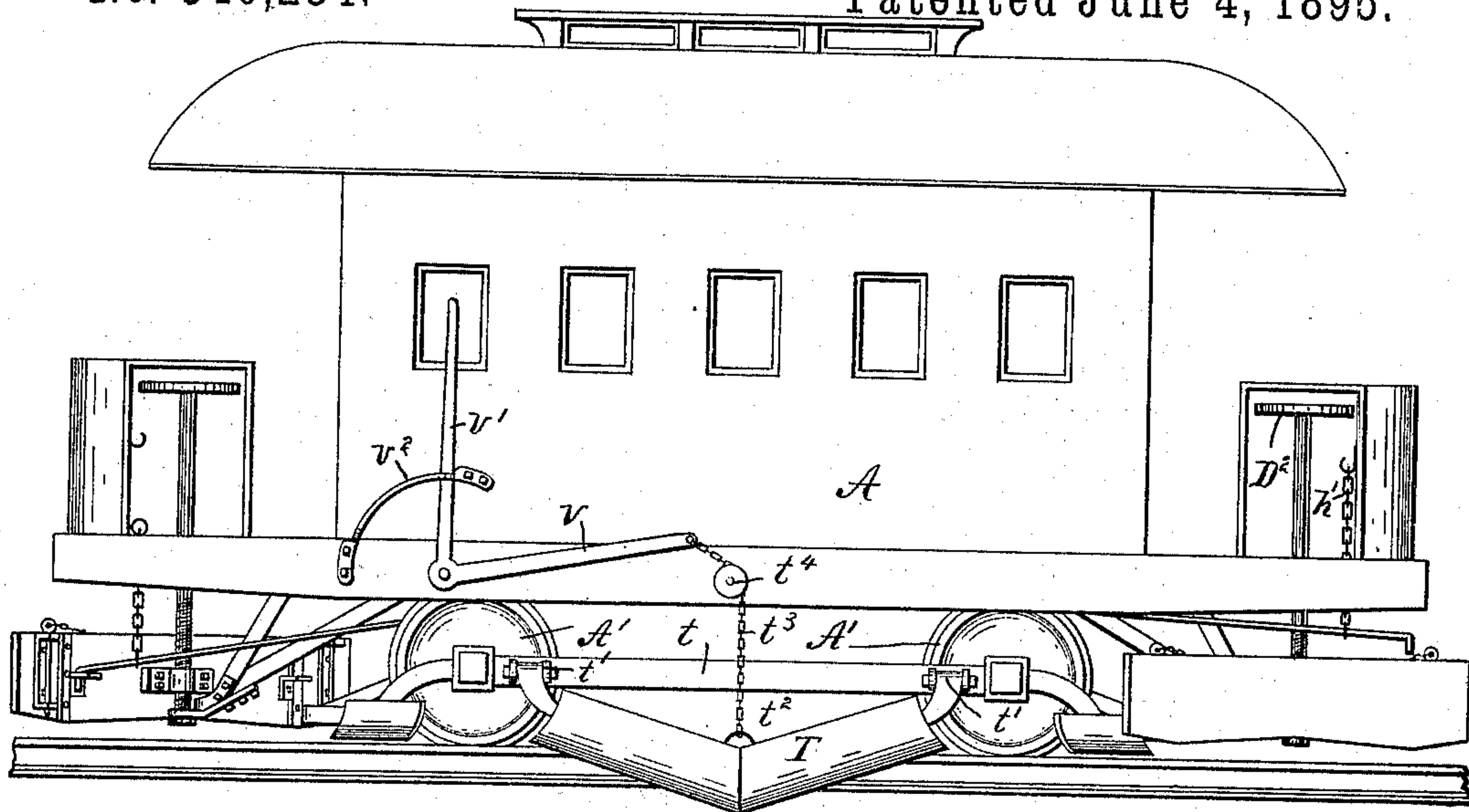


FIG. 10.

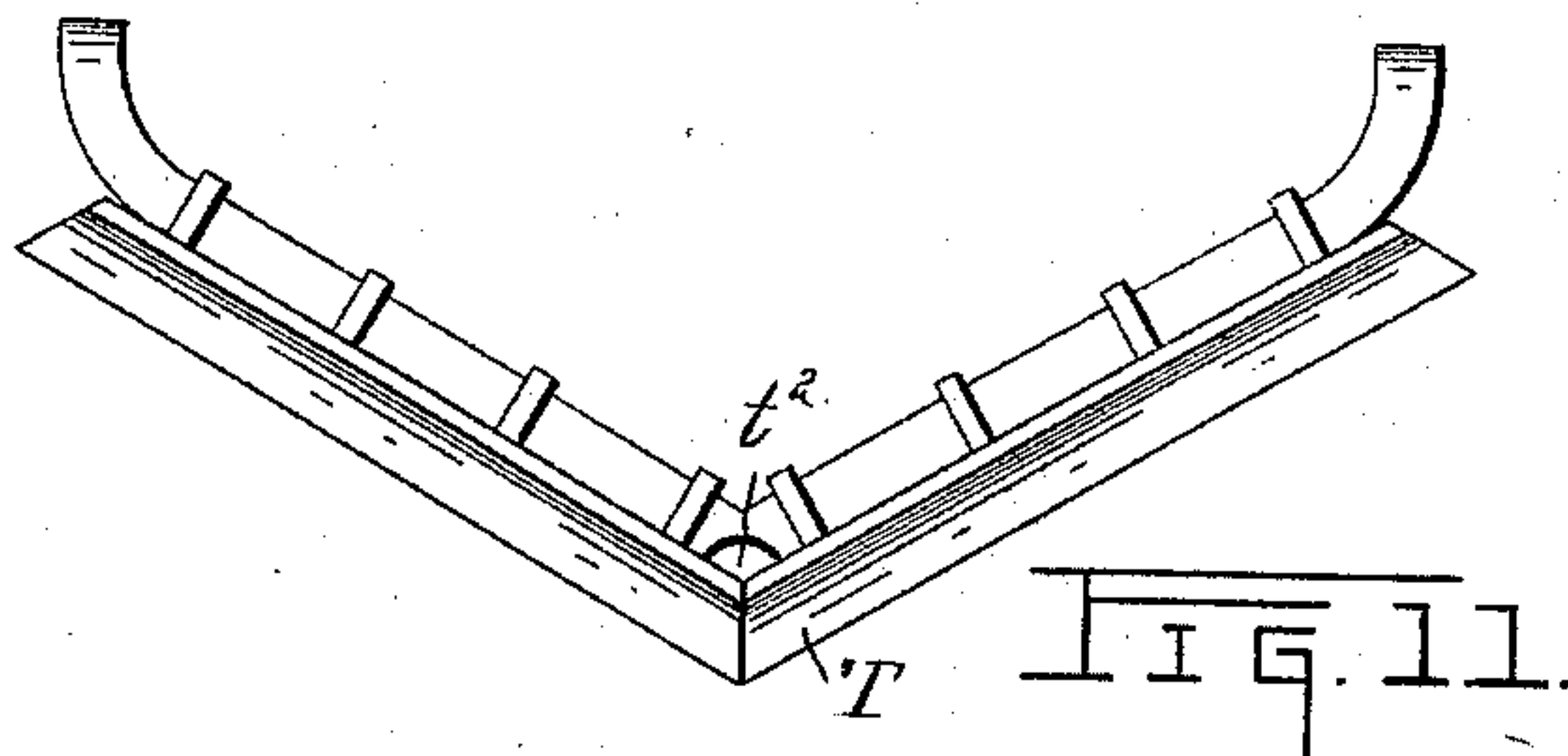


FIG. 11.

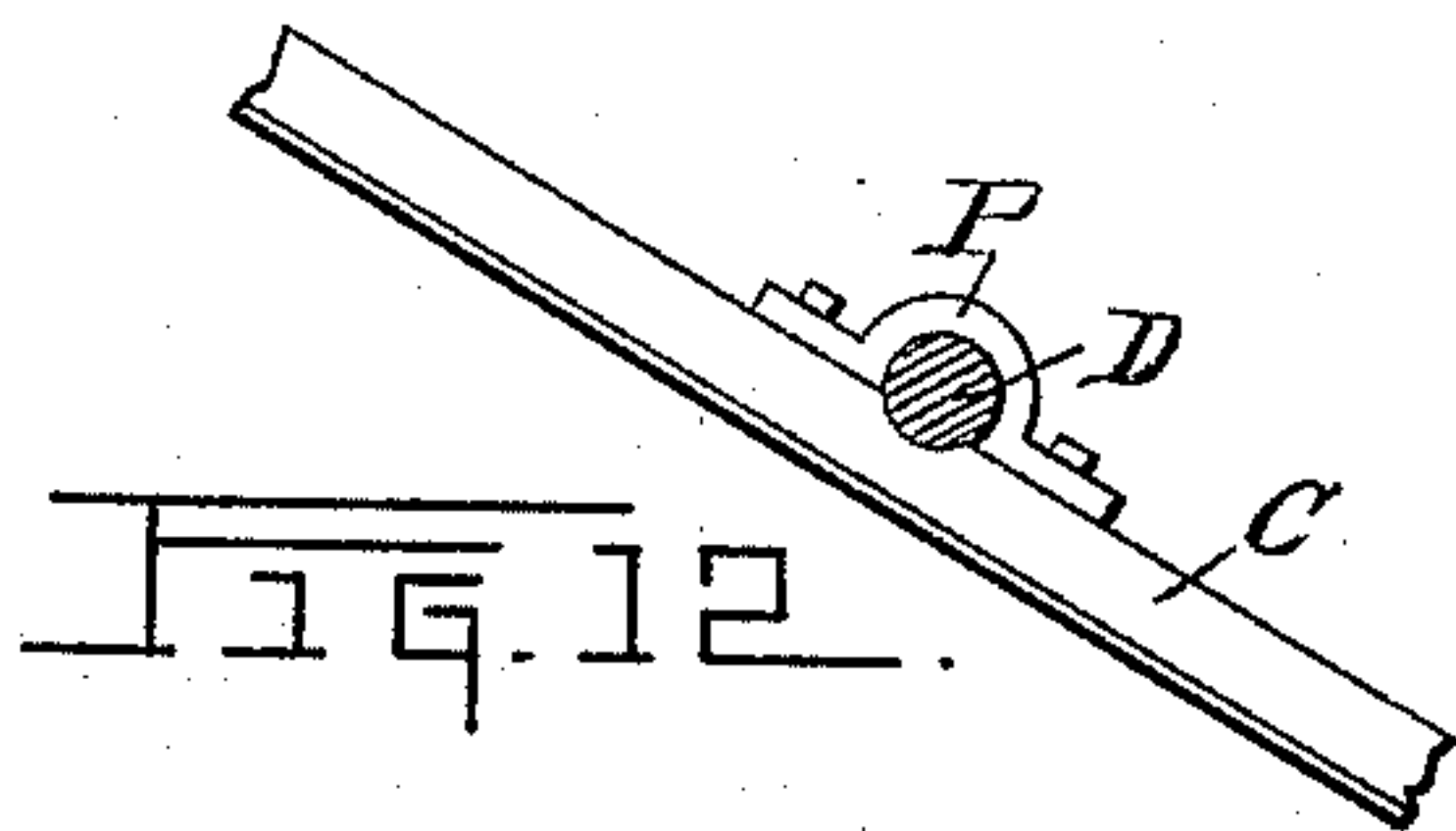


FIG. 12.

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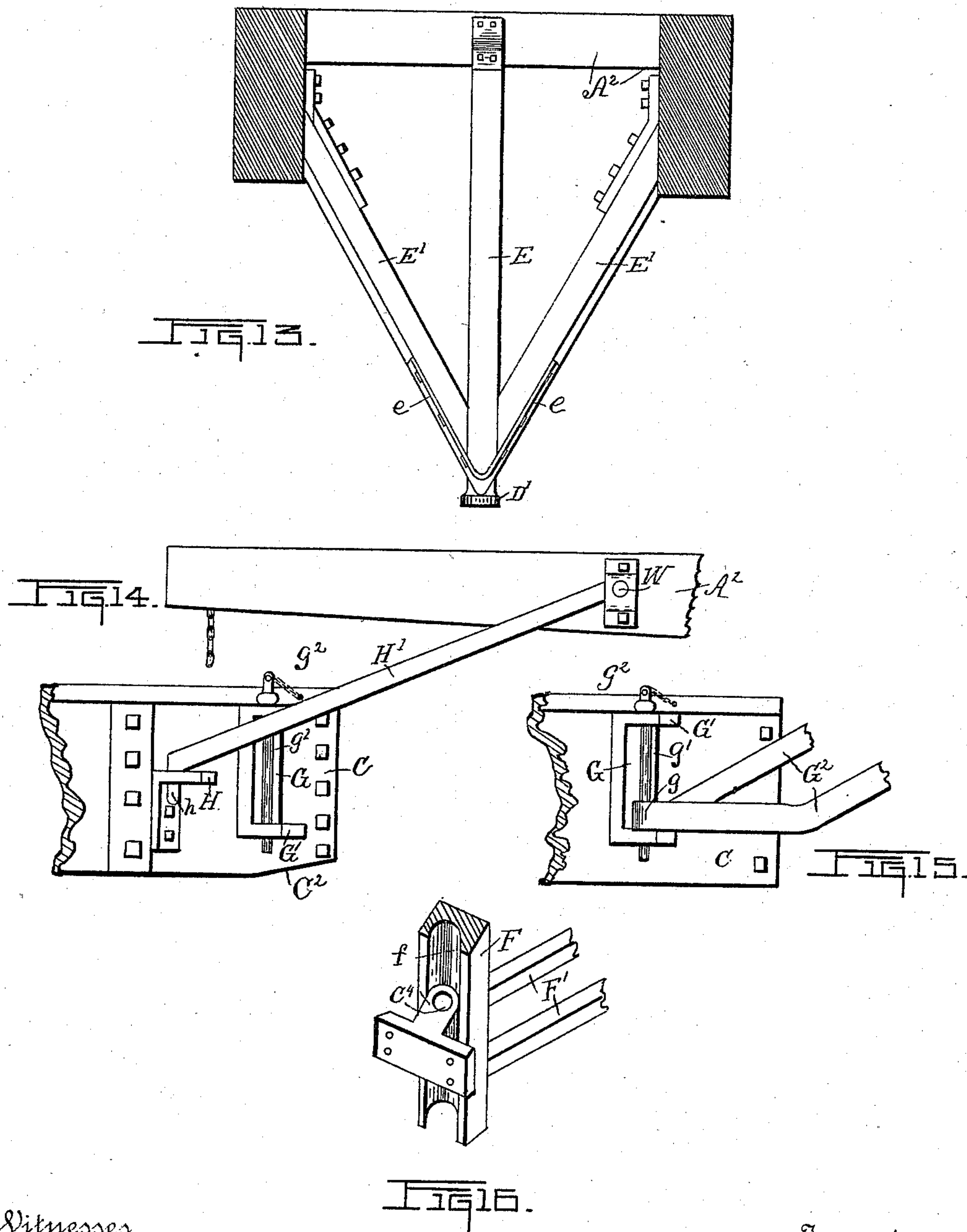
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# UNITED STATES PATENT OFFICE.

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LANCASTER, PENNSYLVANIA.

## SNOW-PLOW.

SPECIFICATION forming part of Letters Patent No. 540,284, dated June 4, 1895.

Application filed August 21, 1894. Serial No. 520,937. (No model.)

*To all whom it may concern:*

Be it known that we, WILLIAM J. TREMPER, CHARLES V. ROTE, and WILLIAM A. ARMSTRONG, citizens of the United States, residing in Lancaster, in the county of Lancaster and State of Pennsylvania, have invented certain Improvements in Snow-Plows, of which the following is a specification.

This invention relates to improvements in that class of plows employed for clearing snow from railway tracks, being particularly applicable to street railways and other surface tracks; and the objects of the invention are, first, to provide a plow adapted to throw all the snow on the track to one or the other side thereof or to divide the snow and throw it on or toward both sides of the track, said plow being constructed to be raised or lowered at will, and, second, to provide side-shovels more effective than those in use for throwing or pushing the snow back from the side of a track.

The invention consists in the construction and combination of the various parts, as hereinafter fully described, and then specifically pointed out in the claims.

In the accompanying drawings, which form a part of this specification, Figure 1 is a side elevation of an end of a car provided with a swinging plow formed in one piece and pivoted at the center, the plow being shown in diagonal rear view. Fig. 2 is a top plan view of the plow shown in the same position, the body of the car being removed. Fig. 3 is a special side view of the socket connection of the plow, and Fig. 4 a top view of the same on broken line *xx* of Fig. 3. Fig. 5 is a top plan view of a jointed plow, showing both sections inclined to the rear; Fig. 6, a front view of the joint of the same, and Fig. 7 a vertical section on broken line *yy* of Fig. 5. Fig. 8 is a view of a truck, showing one form of side shovels attached thereto; and Fig. 9, a top view of said shovels. Fig. 10 is a side elevation of a car having a modified form of side shovel attached thereto, and Fig. 11 a top plan view of said shovel. Fig. 12 is a top view of a modification in the connection between the main or front shovel and its supporting-worm. Fig. 13 is a front view of the parts supporting the bottom of the screw-rod,

the side beams of the car-frame being shown in section. Fig. 14 is a side view of the pivoted connection between one of the tie-rods and the car-frame, the other end of the rod being engaged with one of the brackets H. Fig. 15 is a side view of the connection between the plow and one of struts for bracing the same. Fig. 16 is a front perspective view of the grooved hanger engaged by the sleeve of the screw-rod.

Similar letters indicate like parts throughout the several views.

Referring to the details of the drawings, A indicates a car-body, A<sup>2</sup> parts of the frame supporting the car body, and A' the trucks.

In Figs. 1 to 4 inclusive, *c* represents a vertically movable plow attached to the front of a car, to clear snow from the track. The contour of the lower edge of the plow is waving in outline, the center *c'* and the extremities *c<sup>2</sup>* being raised, to pass over obstructions between and on the outside of the rails when the plow occupies its lowered position, and the parts *c<sup>3</sup>*, located above the rails, are depressed, so as to approach the same as nearly as possible. To the center of the rear face of the plow is attached an internally threaded sleeve, *c<sup>4</sup>*, engaged by a screw-rod, D, having the lower end thereof revolubly secured in a plate, D', and the upper end passing up through the car-platform and carrying a hand-wheel, D<sup>2</sup>. Plate D' is bolted to the lower end of a beam, E, secured to the bottom of the car and extending diagonally downward, the beam being braced by diagonal side struts E', having their lower ends secured to said beam by a strap, *e*. Sleeve *c<sup>4</sup>* may engage a vertical slot, *f*, in a hanger, F, depending from the bottom of the car and braced at its lower end by struts F'.

Plow *c* is moved around screw-rod D, so as to advance and retract its opposite ends, as shown by full and broken lines in Fig. 2, and by turning the screw-rod the plow is also raised and lowered. Near each end of the plow is bolted a vertical plate, G, having an inwardly projecting perforated bracket, G', on each end; and to each side of the car is attached a depressed and forwardly extending strut, G<sup>2</sup>, forming a loop, *g*, each loop being in position to engage the face of a plate



G, between brackets G' when the corresponding end of the plow is retracted, the plow and strut being connected by a pin,  $g'$ , passing through the loop and the perforations in the brackets G' and permanently secured to the plow by a chain,  $g^2$ . Inside of plates G there is a perforated bracket, H, also bolted to each end of the plow. The perforation in the bracket on the advanced end of the plow is engaged by a prong,  $h$ , on the free end of a tie-rod, H', having its rear end pivoted to the car-frame as shown at W, Fig. 14. The free end of the tie-rod H' not connected with the plow is supported by a hook on the end of a chain,  $h'$ , hanging from the platform of the car.

In Figs. 5, 6 and 7 is illustrated a modified form of plow. In addition to being operated in the same manner as the plow before described, this plow is divided centrally into sections I, I', both of which can be retracted at the same time, as shown in Fig. 5, or one section may be advanced, as illustrated by broken lines I<sup>2</sup>, and the other end retracted. In this construction, two sleeves, K, K', formed together, are employed for connecting the screw-rod and plow. Sleeve K is threaded internally and engaged by screw-rod D in the same manner as sleeve  $c^4$ . Sleeve K' is located in front of sleeve K and is embraced above and below by eyes  $l$  of hinge-straps L, secured respectively to sections I, I' of the plow, the parts being hinged on a pin, M, passing through sleeve K' and the eyes of straps L. By the retraction of both sections of the plow an opening or recess, M', is formed at the apex of the triangle, caused by the retraction of the plow-sections; and this recess is covered by a colter, N, removably secured to said sections. On wings N' of the colter are hinge-pins  $n$ , which engage eyes or sockets  $m$  on the faces of the plow-sections and are adapted to be lifted therefrom, as illustrated in Fig. 6.

Fig. 12 illustrates a preferable way of forming a sleeve, P, for engagement with the screw-rod.

Figs. 8 to 11, inclusive, illustrate new constructions of shovels for throwing the snow away from the sides of the track after it has been removed from between the rails by the plow.

In Figs. 8 and 9 is shown a double shovel having the outer ends hinged by rings  $r$  and hooks  $r'$  to the car-body. Rings  $r$  are connected with the ends of ribs  $r^2$ , to which the shovels  $r^3$  are secured. The outer ends of the shovels meet and are joined by a hinge-pin,  $r$ . The meeting ends of ribs  $r^2$  are secured to the car-body by links  $r^5$ , and the shovels are further connected with said car-body by chains  $r^6$ .

Figs. 10 and 11 illustrate a triangular shovel, T, the meeting points or ends of which are formed together. The ribs of this shovel are hinged to a side-bar,  $t$ , of the truck, as shown at  $t'$ . At the apex of this shovel there is a hook,  $t^2$ , and to this is attached a chain,  $t^3$ , passing over a sheave,  $t^4$ , and connected with one arm of a bell-crank lever V the free arm

V' of which engages a rack, V<sup>2</sup>, secured to the side of the car, whereby said shovel can be raised or lowered and secured in such raised or lowered position.

It is obvious that many changes may be made in the details of the construction of our snow-plow without departing from the principle of our invention. We do not limit ourselves to any special connection between the screw-rod and plow in front of the car, nor to the manner of raising the plow by means of the screw-rod, nor to any special mode of hinging the sections of the plow together. Neither do we restrict ourselves to the construction or manner of connecting the parts of the side shovels.

Our improvements involve a radical departure in the construction and principle of operation in snow plows and shovels, the invention consisting, broadly, in a plow pivoted on a screw and adapted to be raised and lowered thereby and in double faced shovels attached to the side of a car and constructed to be raised and lowered.

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

1. The combination, with a car, of a single rod passing through the floor of the car, a snow-plow connected with and supported by the rod, and means for actuating said rod to raise and lower the plow.

2. The combination, with a car, of a single rod passing through the floor of the car, a snow-plow having a revoluble connection with the rod and supported thereby, and means for actuating said rod to raise and lower the plow.

3. The combination, with a car, of a single rod passing through the floor of the car, a snow-plow connected with and supported by the rod, means for actuating said rod to raise and lower the plow, and braces for the ends of the plow.

4. The combination, with a car, of a single rod passing through the floor of the car, a snow-plow having a revoluble connection with the rod and supported thereby, means for actuating said rod to raise and lower the plow, and braces constructed to be detachably connected with the ends of the plow.

5. The combination, with a car, of a screw-rod passing through the floor of said car, and a snow-plow having a revoluble connection with the lower end of said rod, for the purpose specified.

6. The combination, with a car, of a revoluble screw-rod, and a snow-plow having a threaded and revoluble connection with the screw-portion of said rod.

7. The combination, with a car, of a snow-plow having a threaded sleeve rigidly connected therewith, and a vertical worm passing through the floor of the car and engaging said sleeve, the sleeve being revoluble about said worm.

8. The combination, with a car, of a revoluble screw-rod having the stem passing



through the floor of the car, a fixed support for the screw end of the rod located below said floor, and a snow-plow having a threaded and revoluble connection with the screw-portion of said rod, substantially as and for the purpose specified.

9. The combination, with a car, of a screw-rod passing through the floor of said car, a snow-plow revolubly connected at its center with said rod, and means for securing the ends of the snow-plow in advance and retracted positions respectively, for the purpose specified.

10. The combination, with a car, of a revoluble screw-rod having the stem passing through the floor of the car, a fixed support for the screw end of the rod located below said floor, a snow-plow having at its center a threaded connection with the screw rod and means for securing the ends of the snow-plow in advanced and retracted positions respectively.

11. The combination, with a car, of a revoluble screw-rod having the stem passing through the floor of the car, a fixed support for the screw end of the rod located below said floor, a snow-plow, a threaded sleeve at the center of the snow-plow engaging the threaded portion of said rod, brackets on the ends of said plow, and attachments on the car adapted to be connected with said brackets and hold the ends of the plow in advanced and retracted positions respectively, substantially as and for the purpose specified.

12. The combination, with a car, of a snow-plow located in front thereof, said plow being divided into sections connected by a vertical hinge, a revoluble screw-rod passing through the floor of the car, and a connection between the plow and screw-rod, for the purpose specified.

13. The combination, with a car, of a snow-plow, said plow being divided into sections connected by a vertical hinge, a revoluble screw rod having the stem passing through the floor of the car, a fixed support for the

screw-rod located below said floor, and a threaded sleeve connected with said hinge and engaging the thread of the screw-rod, substantially as and for the purpose specified.

14. The combination, with a car, of a snow-plow, a vertical worm passing through the floor of the car and engaging a threaded sleeve on the snow-plow, a support for the base of the worm, and a vertical hanger having a slot engaging the back of the sleeve, substantially as and for the purpose specified.

15. The combination, with a car, of a V-shaped shovel having its wings hinged to the side of the car and the apex extending outward therefrom, and means for raising the apex of said shovel and securing it in an elevated position, for the purpose specified.

16. The combination, with a car, of a V-shaped shovel hinged to the side thereof, the sides of the shovel being connected at their apex by a hinge, and means for securing said apex in an elevated position, substantially as and for the purpose specified.

17. The combination, with a car, of a snow-plow extending transversely of the line of travel of the car, a V-shaped shovel having its apex extending beyond the end of the snow-plow and the wings thereof hinged to the side of the car, and means for raising the apex of said shovel and securing it in an elevated position, for the purpose specified.

18. The combination, with a car, of ribs connected at their meeting ends to form a V, the outer ends of said ribs being hinged to the side of the car, shovels secured to the ribs, and means for raising the apex of said ribs and securing the shovels in an elevated position, substantially as and for the purpose specified.

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