

(No Model.)

3 Sheets—Sheet 1.

G. ESTERLY.
HARVESTER.

No. 385,047.

Patented June 26, 1888.

Fig. 1.

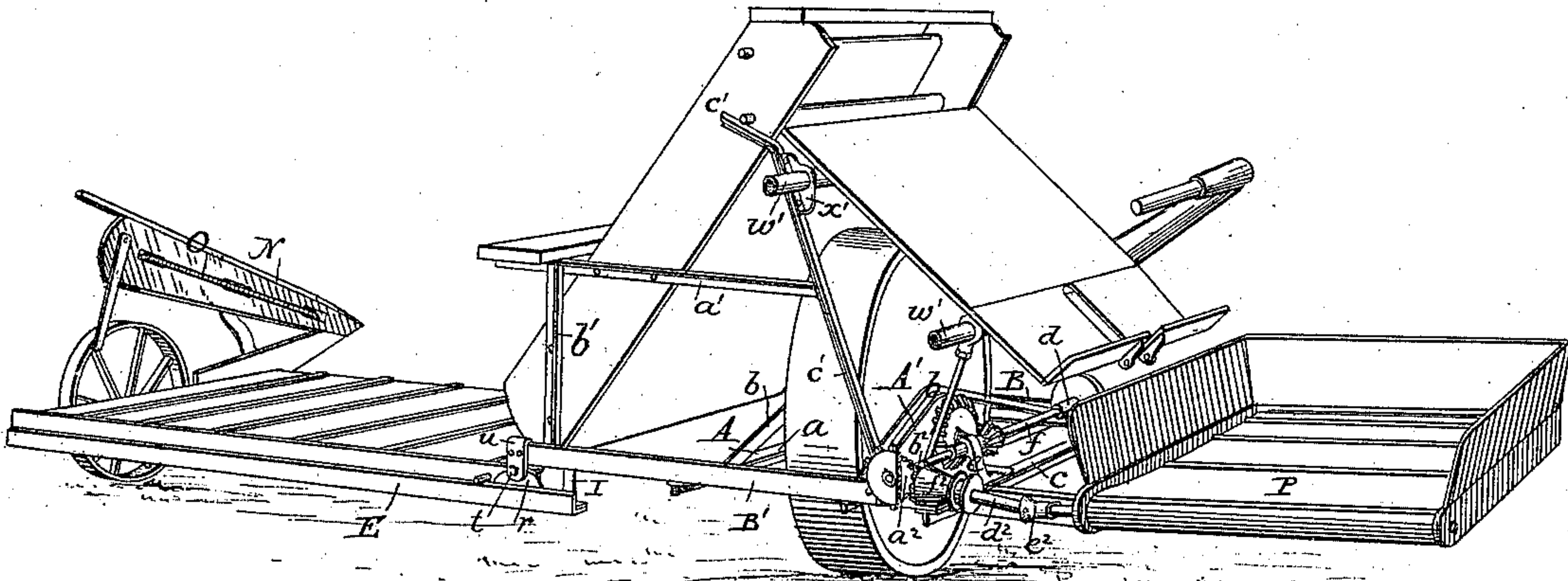
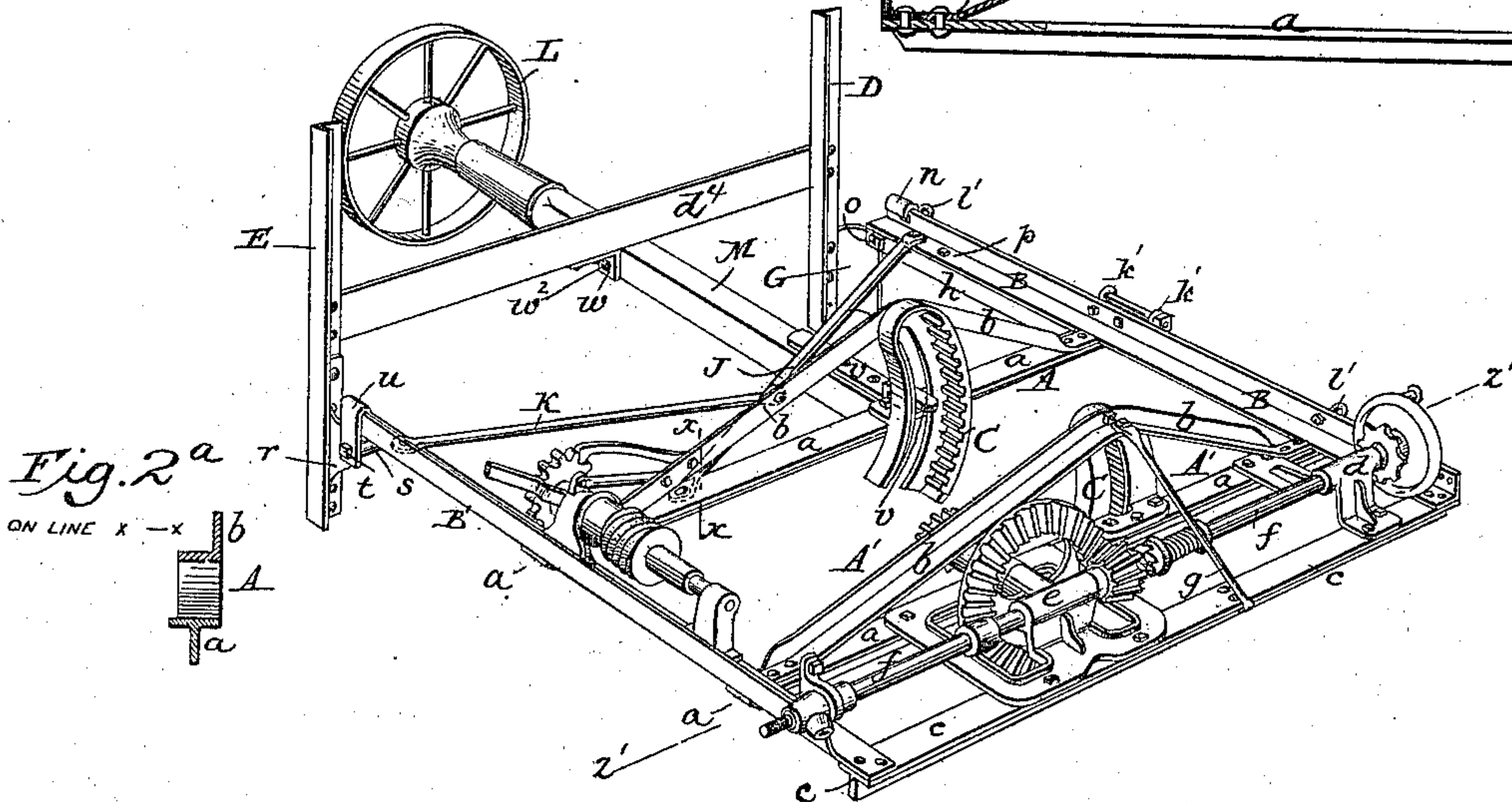
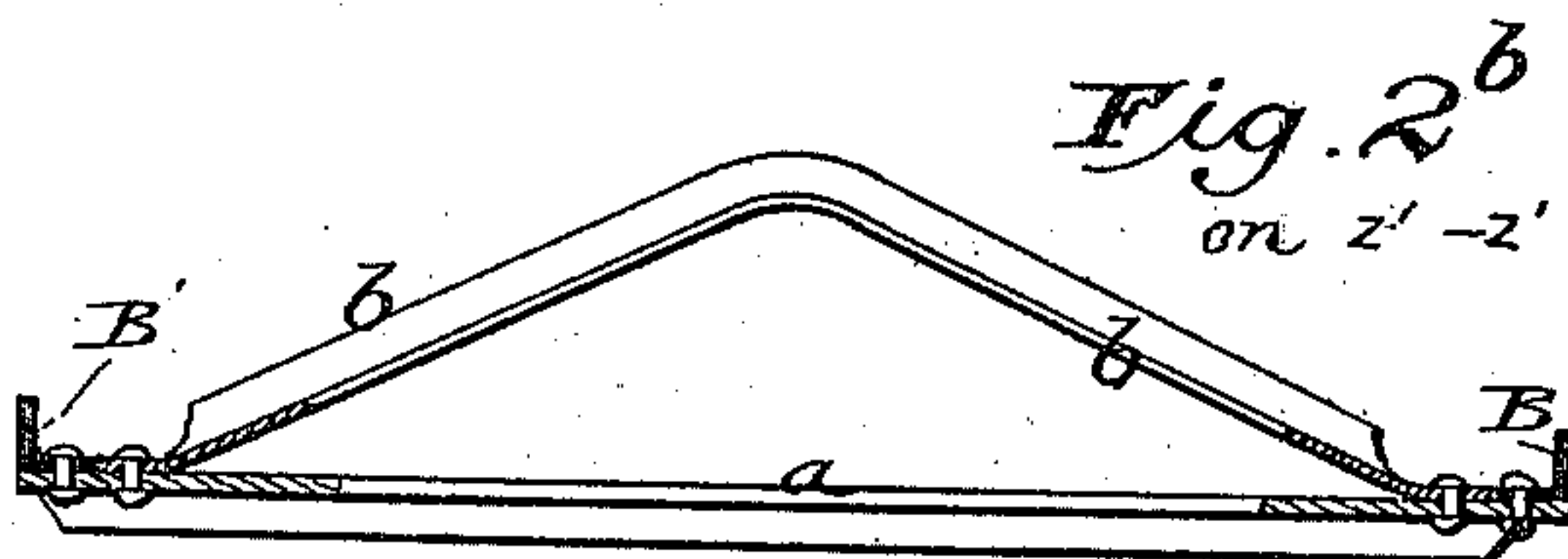


Fig. 2.



Attest:

Sidney P. Hollingsworth
W. R. Kennedy.

Inventor:

George Estely.
By his atty
P. T. Dodge.

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Fig. 3.

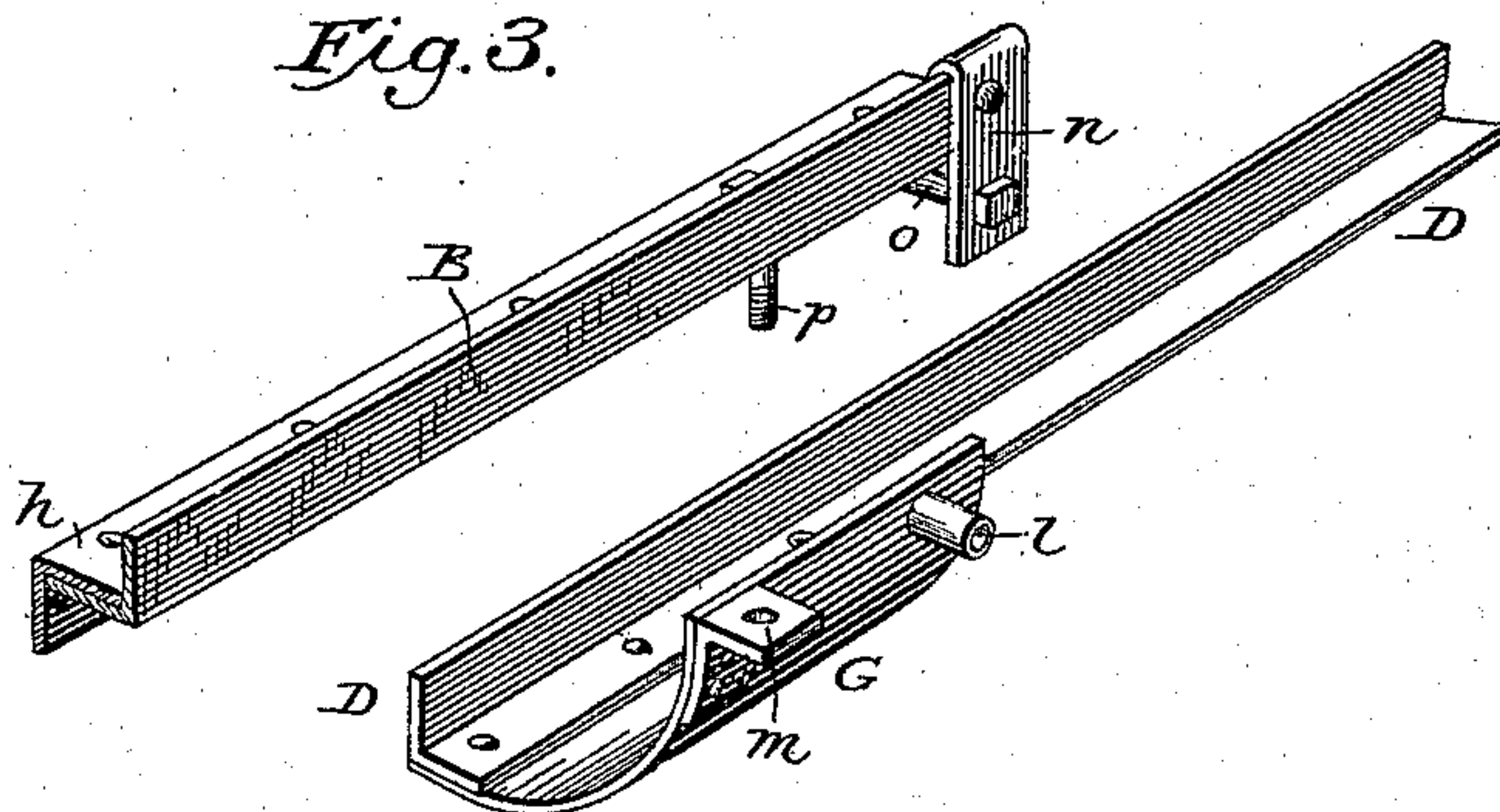


Fig. 4.

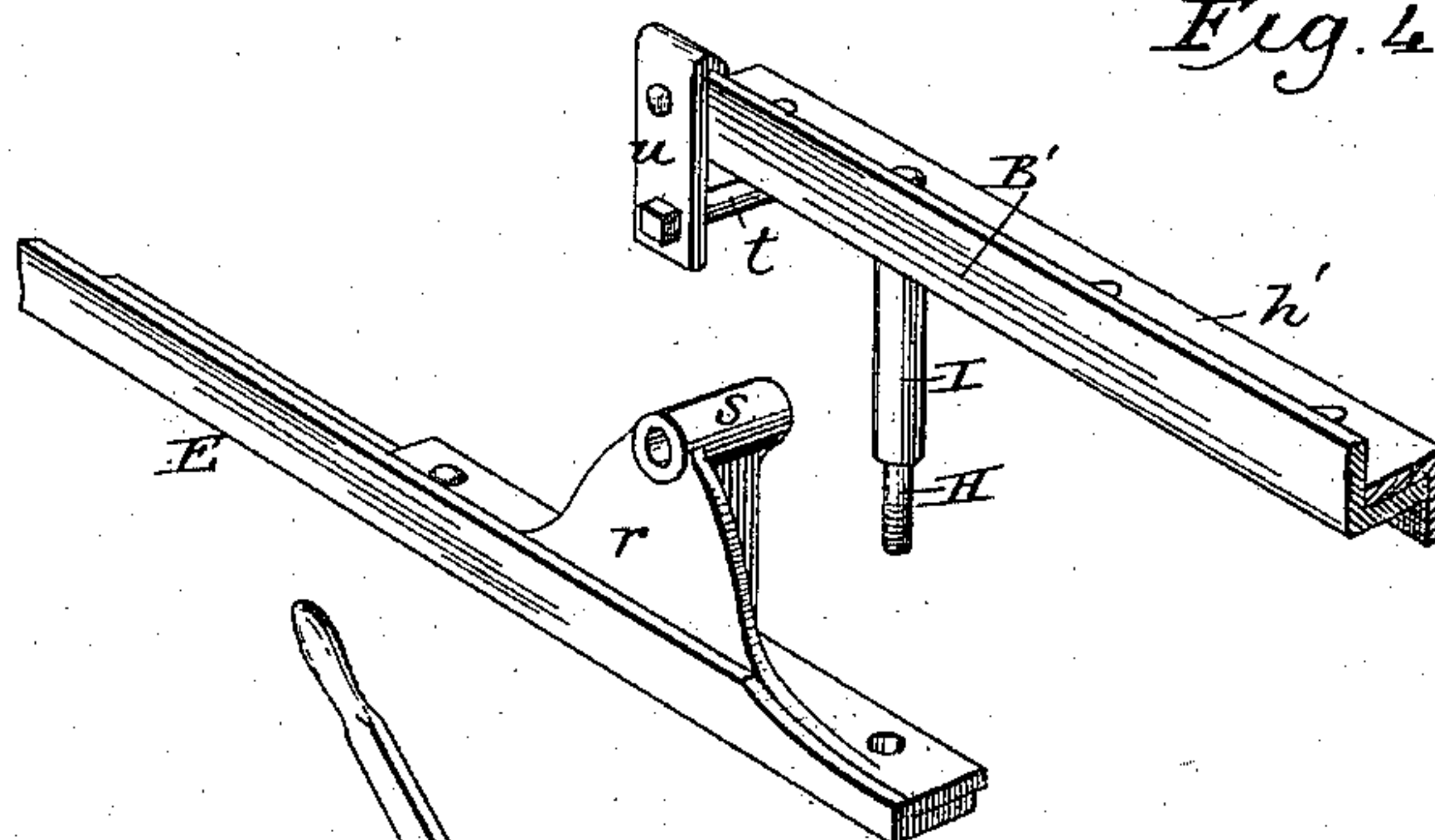


Fig. 5.

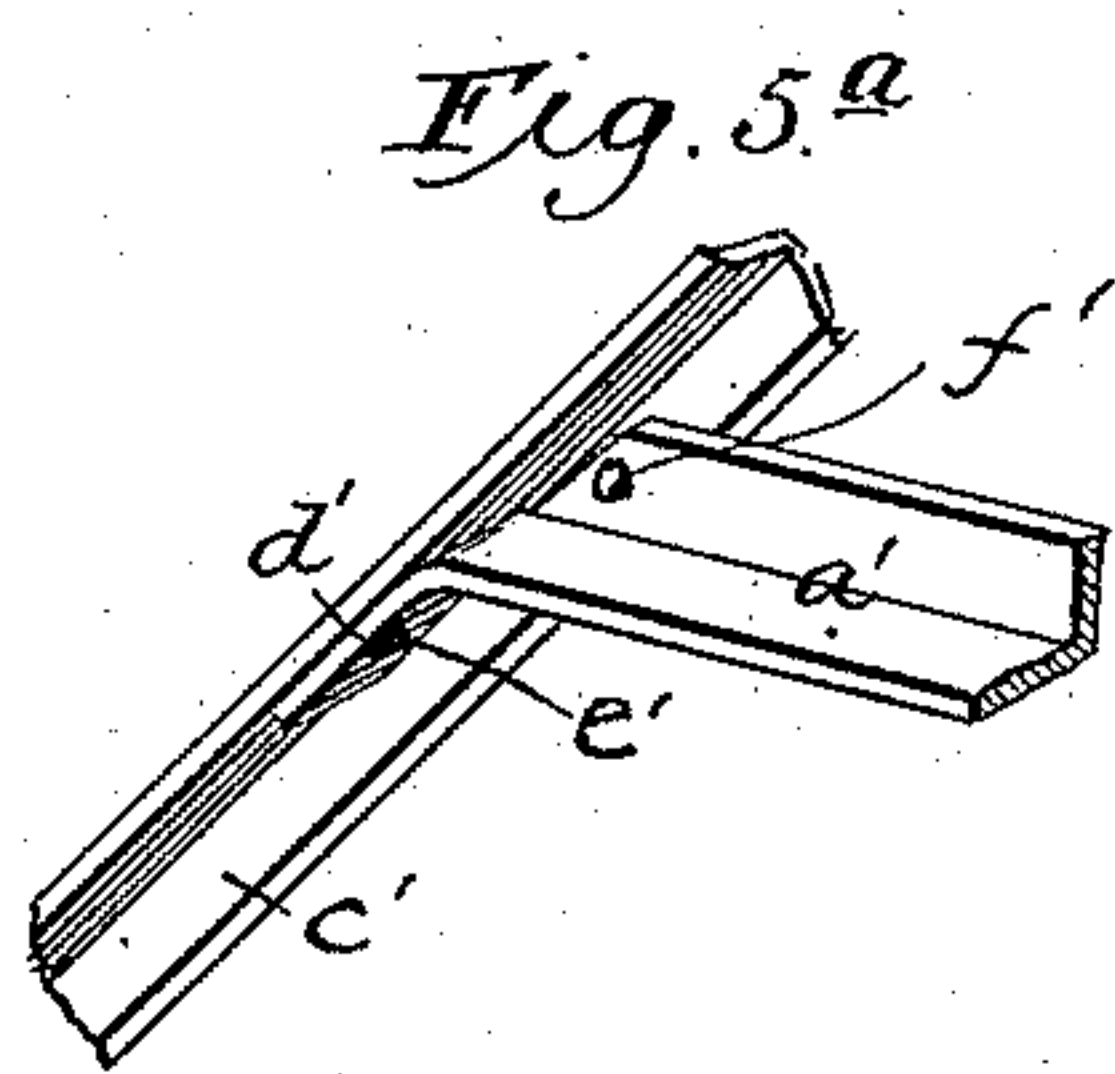
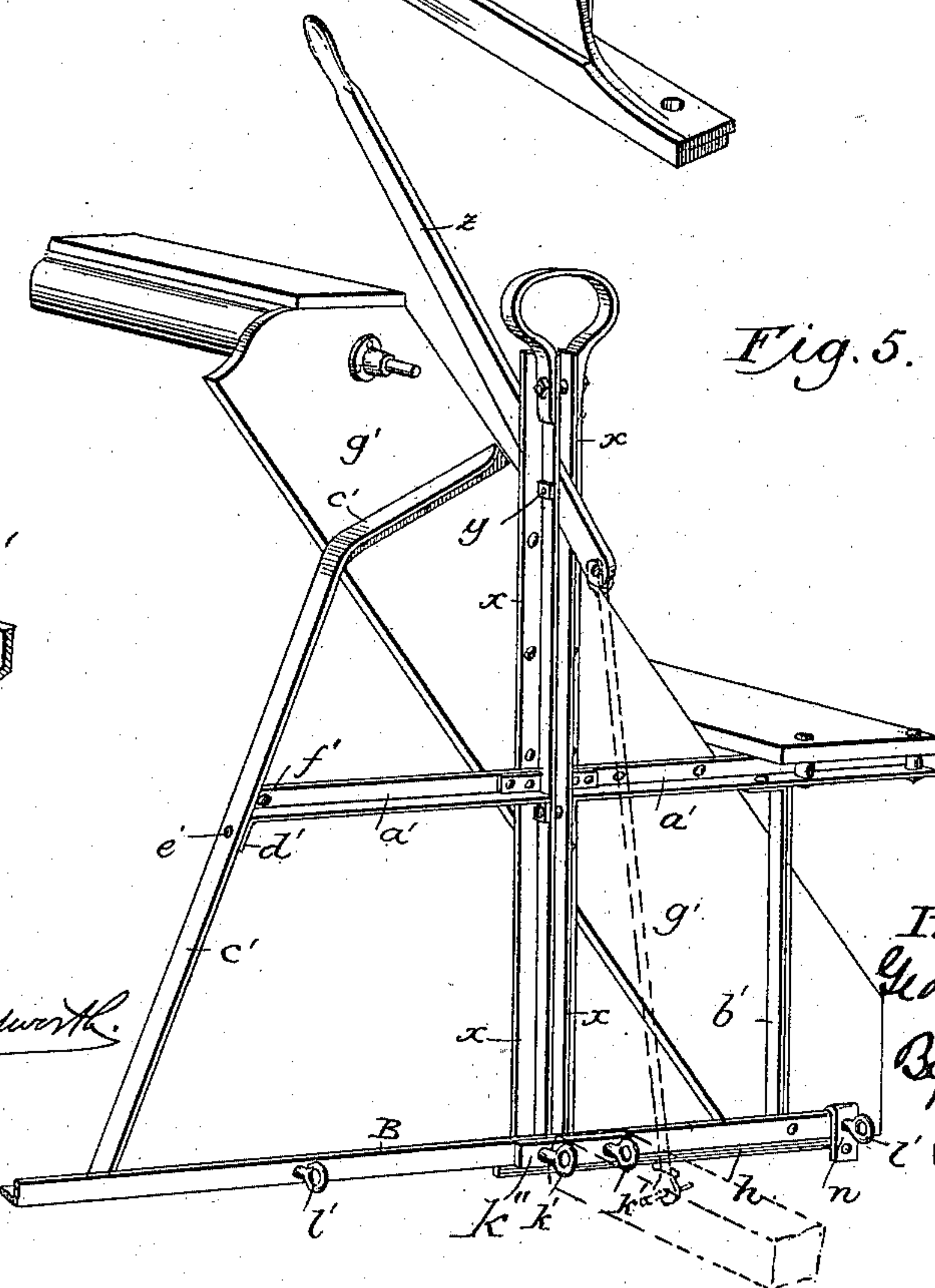


Fig. 5a

Attest.
Sidney P. Hollingsworth.
H. A. Kennedy.



Inventor:
George Esterly
By his atty
P. T. Dodge.

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Fig. 6.

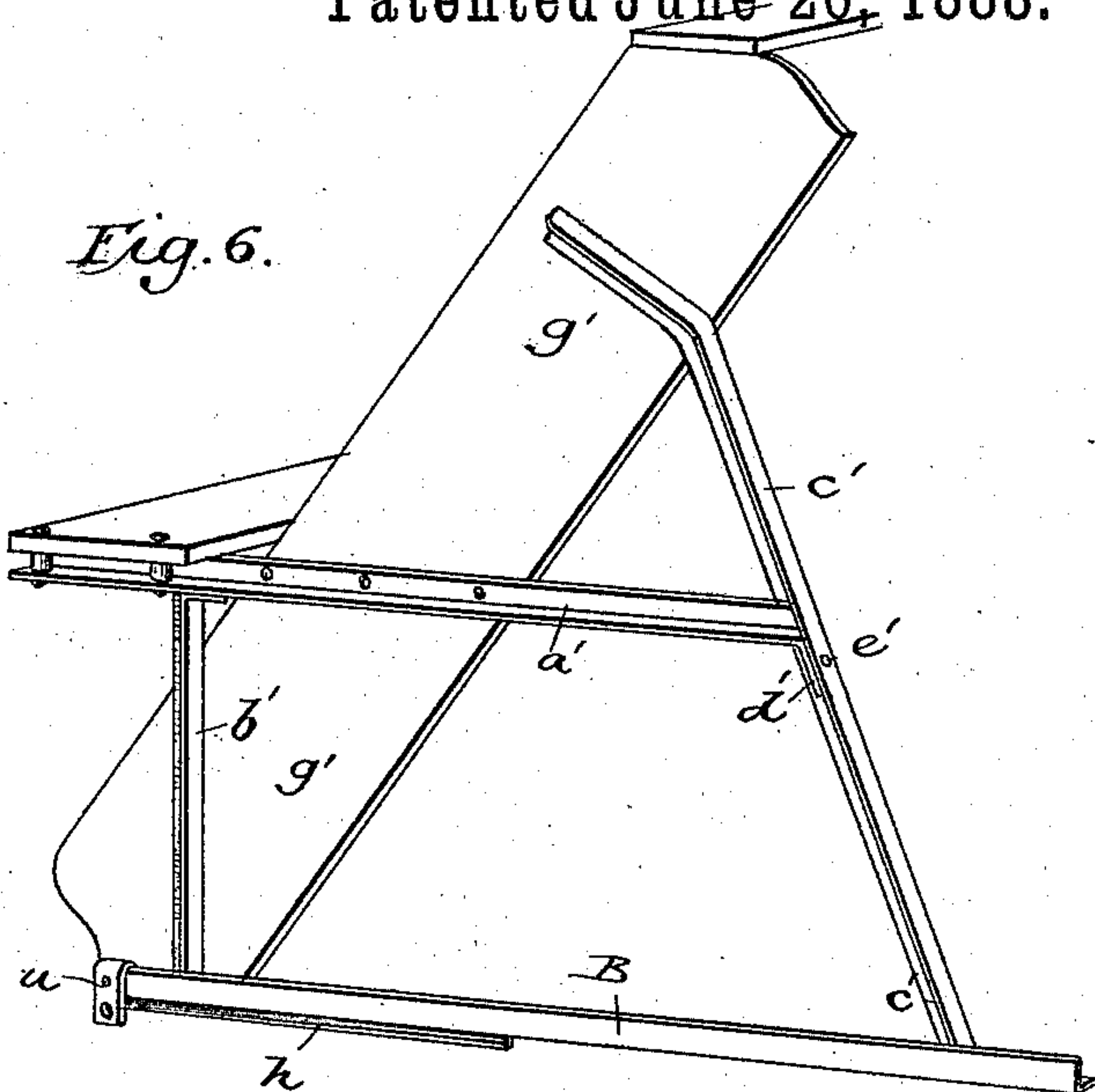


Fig. 9

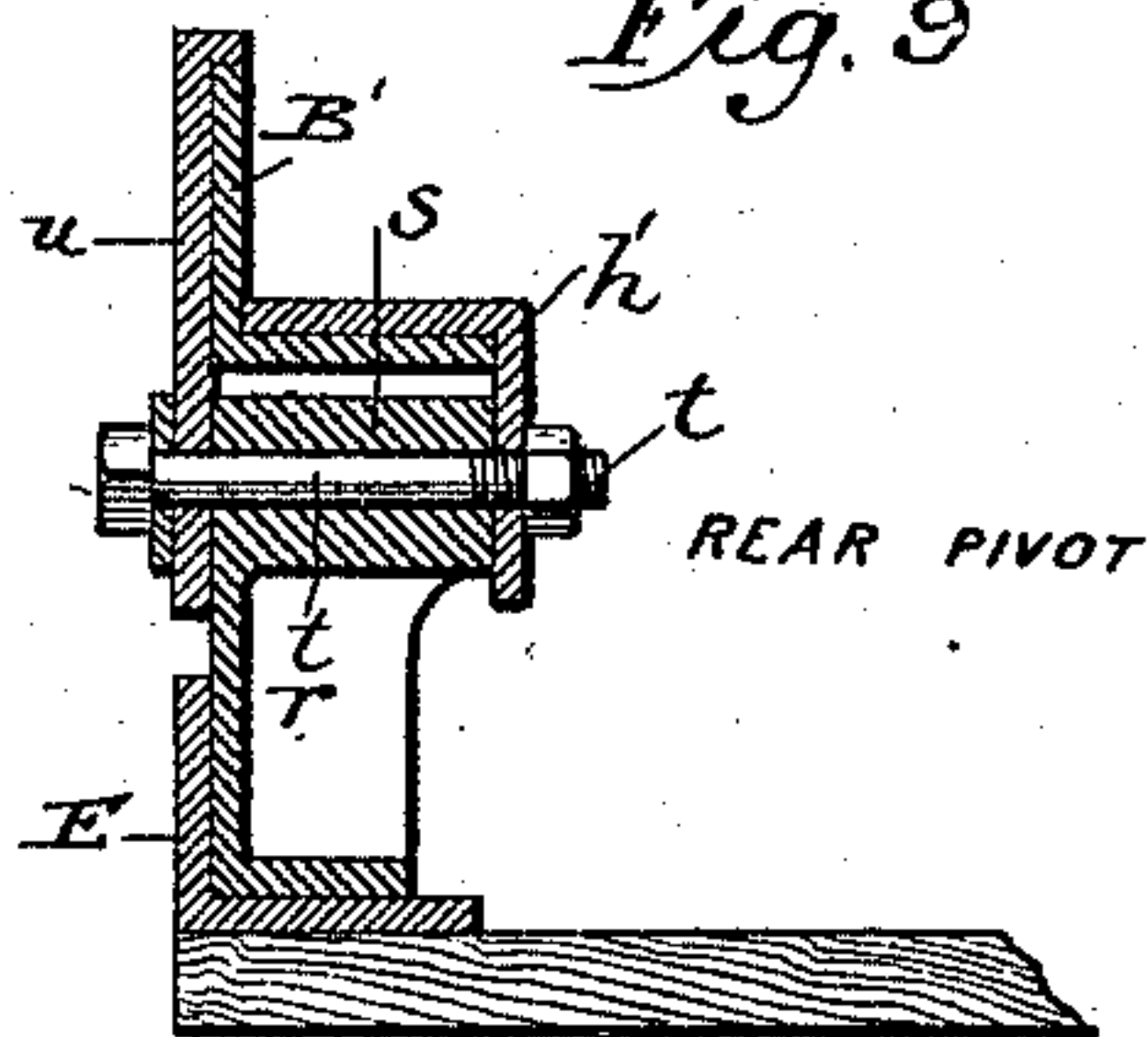


Fig. 8.

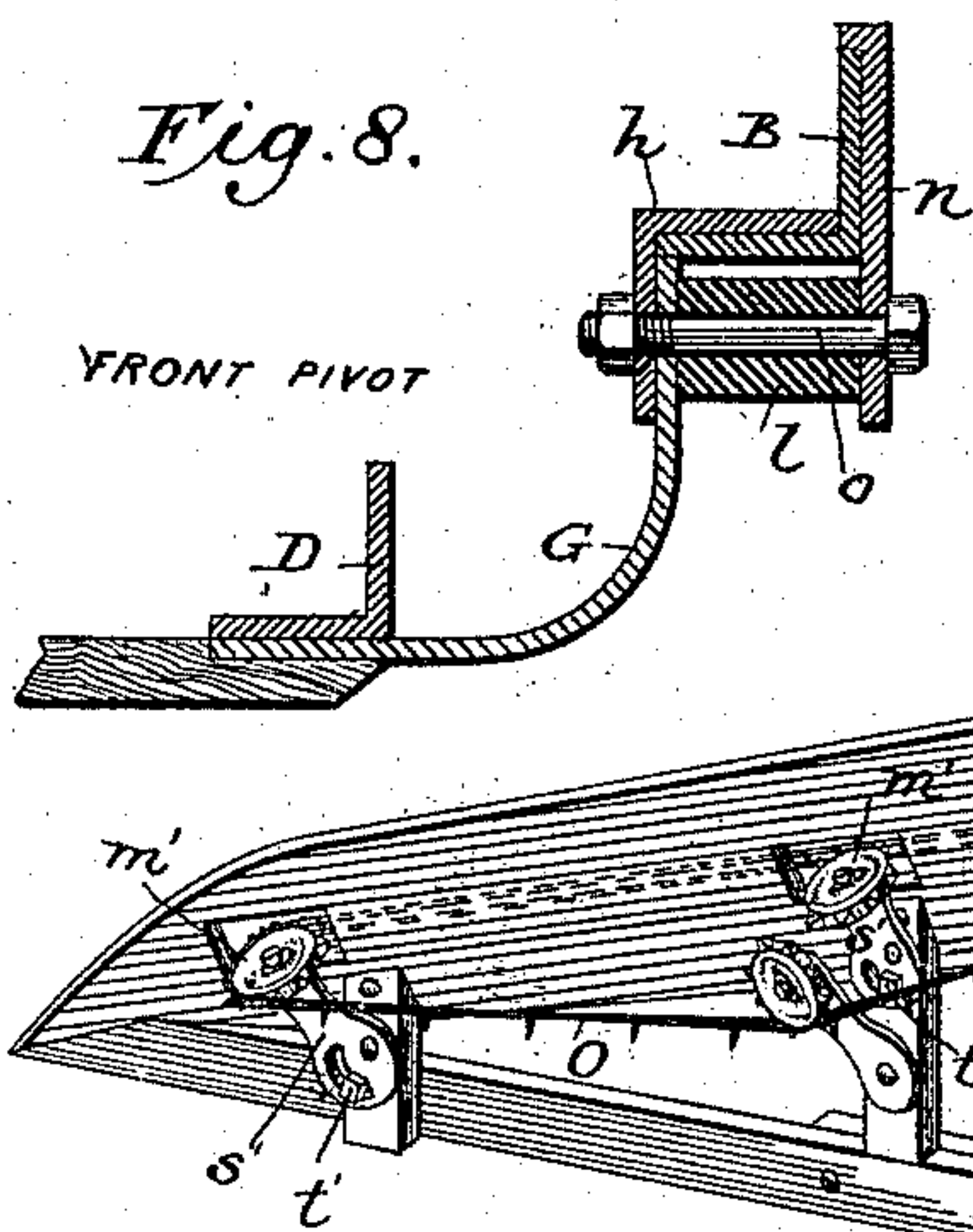


Fig. 7.

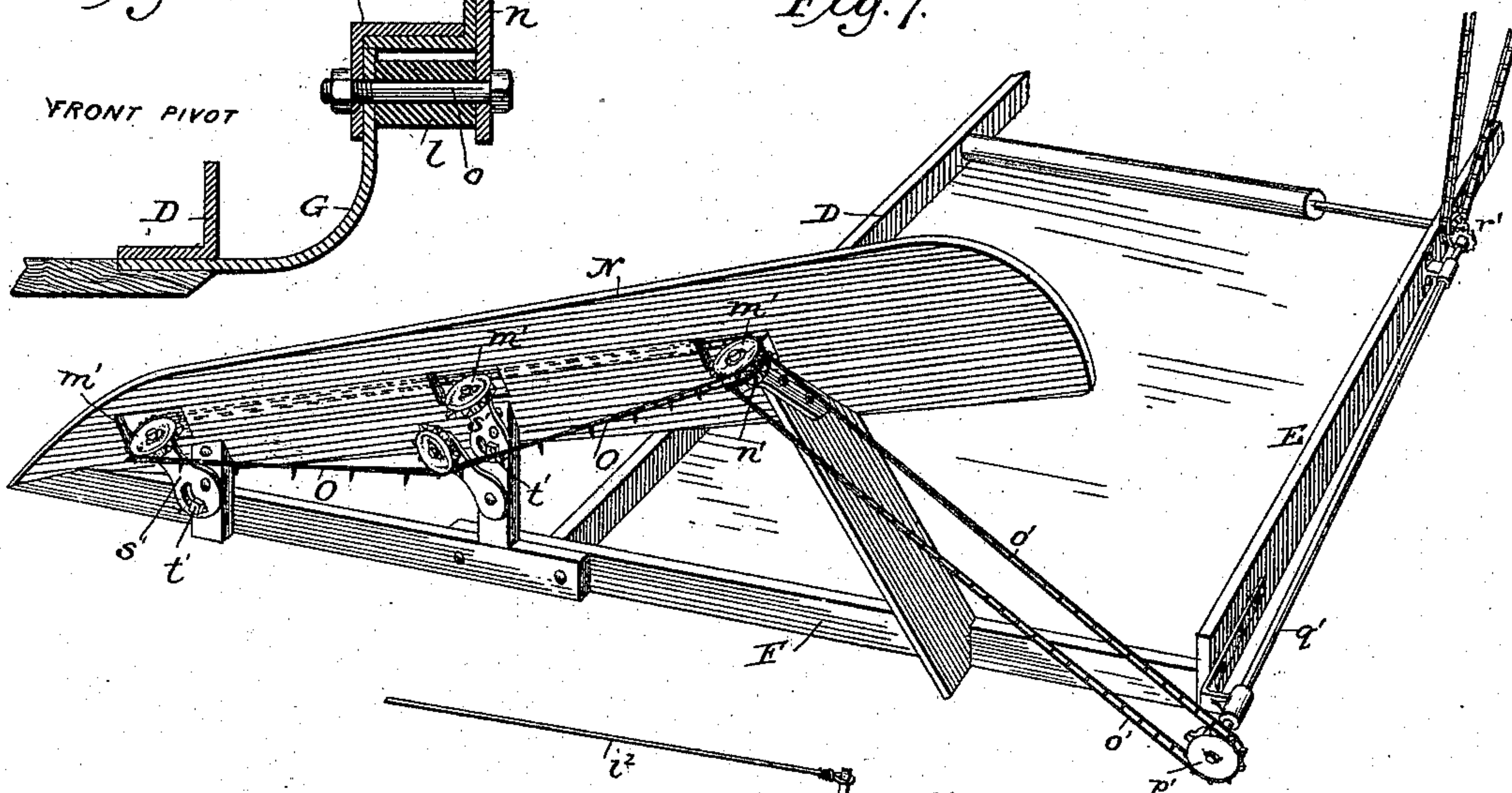
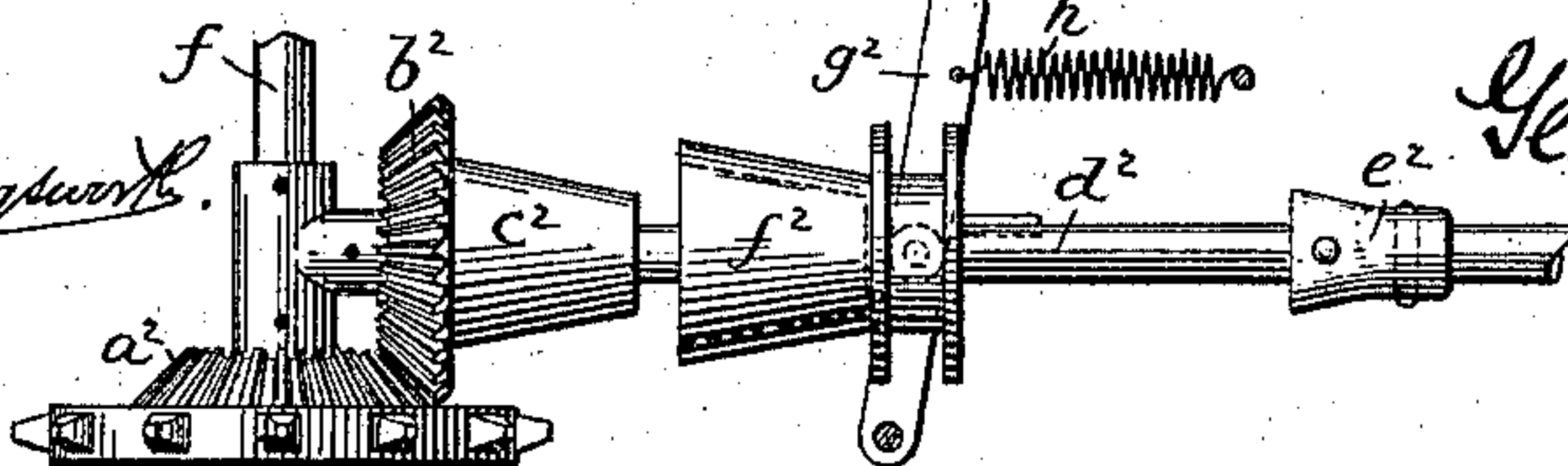


Fig. 10



Attest:

Sidney P. Hollingsworth.

H. A. Kennedy.

Inventor:

George Esterly.
By his atty.
P. F. Dodge.

UNITED STATES PATENT OFFICE.

GEORGE ESTERLY, OF WHITEWATER, WISCONSIN.

HARVESTER.

SPECIFICATION forming part of Letters Patent No. 385,047, dated June 26, 1888.

Application filed April 27, 1887. Serial No. 236,343. (No model.)

To all whom it may concern:

Be it known that I, GEORGE ESTERLY, of Whitewater, in the county of Walworth and State of Wisconsin, have invented certain Improvements in Harvesters, of which the following is a specification.

This invention has reference more particularly to the ordinary class of machines in which the grain is delivered from a rectangular platform by elevating-aprons over the main wheel to a binder located at the outer side thereof; and it consists in various improvements in the construction of the main frame, composed mainly of angular wrought metal or steel bars; in the peculiar formation of hinge-joints, permitting the platform to be turned to an upright position when the machine is to be transported; in the peculiar manner of attaching the grain-wheel when the machine is folded as above, and in various other details, which will be hereinafter described.

In the accompanying drawings, Figure 1 is a perspective view of a harvester and binder having my improvements incorporated therein, the machine being viewed from the rear stubble-corner and many of the usual parts foreign to the invention being omitted. Fig. 2 is a perspective view of the main-wheel frame and the inner end of the platform-frame, the latter being shown in a folded or upright position, with a supplemental wheel attached thereto, the parts being viewed from the rear stubble-corner. Fig. 2^a is a cross-section on the line xx , Fig. 2. Fig. 2^b is a vertical section through the frame from front to rear on the line $x'x'$ of Fig. 2. Fig. 3 is a perspective view illustrating the joint by which the front side of the platform-frame is connected to the wheel-frame, the parts being separated. Fig. 4 is a similar view of the joint connecting the rear edge of the platform-frame to the wheel-frame. Fig. 5 is a perspective view from the front, showing the construction of the framing by which the elevator and seat-plank are sustained. Fig. 5^a is a perspective view illustrating the manner of uniting the angular members of the frame. Fig. 6 is a perspective view showing the elevator and seat supports as viewed from the rear. Fig. 7 is a perspective view of the outer or grain end of the platform-frame, showing particularly the divider

and carrier thereon. Fig. 8 is a vertical cross-section through the front joint connecting the platform-frame and wheel-frame on the line of its axis. Fig. 9 is a similar view of the rear joint. Fig. 10 is a top plan view of the mechanism for driving the bundle-carrier.

The wheel-frame of my machine is constructed, as shown in Fig. 2, of a rectangular form, comprising as its main elements two parallel trusses, $A A'$, extending in a fore-and-aft direction and connected at their ends by cross-bars $B B'$.

The trusses $A A'$, frequently known as "side frames," consist each of a straight bottom bar, a , of a T form in cross section, and of an upper bar, b , of an L form in cross-section. The upper bar is bent upward from its two ends to a point near its middle. Its extreme ends are extended horizontally, seated firmly on top of the bar a near the ends of the latter and riveted firmly thereto. The bar a extends a slight distance beyond the bar b at each end in order to underlie and support the front and rear bars, $B B'$, to which it is firmly riveted or bolted. The bars $B B'$ are of L form in cross-section, as shown in Figs. 2 and 2^a. The bars a and b are connected at the middle by an upright segmental slotted rack-plate, C , having lateral flanges, which are seated against and bolted or riveted to the bars a and b , as shown. These rack-plates, which are designed to receive the axle of the main wheel and its pinions, by which the vertical adjustment of the frame is effected, are of ordinary construction, and, being familiar to every person skilled in the art, need not be further described.

The front and rear bars, B and B' , are each of an L form in cross-section, their lower flanges being extended inward horizontally, seated on the ends of the bar a and riveted thereto, as shown in the several figures. The bars $B B'$ are extended outward on the stubble side of the machine beyond the outer truss, A' , and are riveted and give support to a bar, c , of a T form in cross-section. This bar, extending in a fore-and-aft direction parallel with the outer truss, assists in supporting the bearings d and e of the shaft f . As shown in Fig. 2, these bearings are supported at the inner side on the lower member, a , of the truss A' and at the outer side on the bar c . To give ad-

ditional support to the bar *c*, I employ a brace, *g*, extending from the middle of the bar to the upper part of the truss *A'*. The shaft *f*, through which motion is communicated to the binder
5 and to the cutting apparatus in the ordinary manner, receives motion through a pinion thereon from intermediate gearing of the usual character connected with the main wheel.

In order to adapt the main-wheel frame for
10 the proper attachment of the platform-frame thereto, the front and rear bars, *B B'*, are extended horizontally on the grain side beyond the truss *A* a distance of eighteen inches, (more or less,) and strengthened or stiffened by the
15 application of L-shaped bars *h h'* to their upper sides, the bars being riveted firmly together, as shown in Figs. 3 and 4.

The bars *h h'* are applied as shown in Figs. 3 and 4, their horizontal portions being applied on top of the corresponding faces of the bars *B B'* and their vertical portions extended downward below said bars.

The platform-frame consists of a front sill or finger-bar, *D*, and a rear sill, *E*, the two
25 connected at the outer end by a cross-bar, *F*, riveted firmly thereto, each of the bars *D* and *E* being, as shown, of an L form in cross-section. This platform-frame I hinge to the wheel-frame in such manner that it may be turned
30 upward at the outer end until it assumes an approximately vertical position, as in other machines at present known in the art. I have, however, devised an improved construction of the hinge-joints for this purpose, such as
35 plainly shown in Figs. 3 and 4.

The finger-bar *D* has riveted firmly thereto a forward and upward curved plate or shoe, *G*, provided at the front grainward or outer corner with a forward extending stud or sleeve,
40 *l*, and at the stubbleward or inner front corner with a perforated ear, *m*. To the overhanging end of the front bar, *B*, is riveted a plate, *n*, the upper end of which is turned over the vertical flange of the bar to relieve the bolt, hereinafter mentioned, from the strain and give it
45 firm support. The horizontal pivot-bolt *o* is passed in a fore-and-aft direction through the lower end of this plate *n*, through the thimble *l*, and shoe *G* of the finger-bar. A vertical
50 bolt, *p*, passed through the front bar, *B*, and through the ear *m* of the shoe, holds the finger-bar rigidly in its horizontal position when the machine is in action.

To the rear sill, *E*, is bolted firmly a casting,
55 *r*, having at its upper end a transverse sleeve or eye, *s*, to receive a pivot-bolt, *t*, by which it is connected to a plate, *u*, hooked upon the vertical flange and riveted firmly to the overhanging end of the rear cross-bar, *B'*, of the
60 wheel-frame, a vertical bolt, *H*, located stubbleward from the pivot-bolt, passing downward through the bar *B'* and through the sill *E*, and also through an intermediate sleeve or stop-piece, *I*, serving to hold the rear sill rigidly in
65 position. By removing the front bolt, *p*, and the rear bolt, *H*, the front and rear sills are

released, permitting the platform-frame to be turned upward around the bolts *o* and *t*, the axes of which coincide.

It is to be noted as a peculiarity of my joint
70 that the pivots are located above the level of the platform-sill and below the sills of the wheel-frame, instead of being passed directly through and above the sills, as in other machines. This is advantageous in that it per-
75 mits the sills of the wheel-frame to be kept above the level of the platform-frame and at a greater height than usual from the ground, whereby the machine is the better adapted to
80 pass over obstructions.

In order to stiffen the wheel-frame and give support to the overhanging ends of the bars *B B'*, I extend braces *J K* inward from the ends of said bars, as shown in Fig. 2. The brace
85 *J* extends rearward and stubbleward, and is bolted to the lower member, *a*, of the inner truss, *A*, near the rear side. The brace *K* is carried forward, stubbleward, and upward, and bolted rigidly to the upper member, *b*, of the truss *A*.

For the purpose of supporting the grain side
90 of the machine when the platform is in the upright position, I propose to apply the grain-wheel at or near the heel end of the platform, as has already been done in other machines.

As a substitute for the usual means of sup-
95 porting and carrying the grain-wheel when the platform is folded, I have devised the arrangement represented in Fig. 2, in which *M* represents a short detachable axle extending grainward from the inner side of the main frame
100 beneath the inner end of the folded platform to the grain-wheel *L*, which is mounted temporarily thereon. The axle is carried at the grain end by the wheel *L* and at the stubble end by the main wheel-frame, and at an inter-
105 mediate point in its length it is seated beneath the cross board or bar *d'* at the inner or stubble end of the platform. This bar or board may be one of the sheathing-boards on the under side of the platform-frame, as usual, or it
110 may be a special bar or board applied for the purpose, the only requirement being that it shall be of sufficient strength to ride upon the axle and sustain the weight of the platform-frame. The axle *M* is provided at its inner
115 end with the plate *v*, which enters the inner end of the slotted rack-plate *C* of the main-wheel frame, bearing on its flanges or on top of the bar *a*. A knee brace or plate, *w*, fixed to the bar or plank *d'*, is connected by a bolt, *w'*, with
120 the axle *M*, or otherwise temporarily attached thereto, to retain the axle in place.

The essence of the invention resides in extending the axle temporarily from the grain side of the main-wheel frame beneath the inner
125 end of the folded platform to the grain-wheel. The details of the devices for holding it in position may, of course, be modified within the range of mechanical skill.

It will be observed that the axle, applied as
130 above, may be quickly detached, and that when in position it gives direct support to the plat-

form-frame and to the inner side of the wheel frame, allowing the machine to be transported with the same facility as an ordinary two-wheeled harvester.

5 In Fig. 2 I have omitted from the platform-frame bottom boards and other parts commonly employed in order to expose the wheel to view, the omitted parts having no connection whatever with my invention.

10 In order to give partial support to the binder to the elevator-frame, commonly denominated the "A frame," and to support the seat-plank, I erect on top of the wheel-frame metal frames, one at the front and the other
15 at the rear in the manner which I will now describe.

I erect on the front bar, B, of the wheel-frame, as shown in Fig. 5, two parallel upright bars, x , and through these I pass a
20 pivot, y , supporting a hand-lever, z , the rear end of which stands adjacent to the driver's seat, while the front end is connected in any ordinary manner with the hinged tongue for the purpose of tilting the machine. From the
25 bars x , midway of their height, I extend in opposite directions horizontal bars a' . The grainward one of these bars is supported by a vertical bar, b' , rising from the front of the wheel-frame. From the front bar, B, of the
30 wheel-frame, near its outer or stubble side, a bar, c' , is extended upward in an inclined position, and its upper end turned sharply inward toward the grain side of the machine and riveted or screwed to the side-board of the elevator. At the point where the several
35 bars meet each other they are riveted firmly together, the joint in each case being formed in the peculiar manner illustrated in Fig. 5^a. As shown in this figure, one of the bars has its
40 vertical flange removed from the end backward a short distance and the horizontal flange turned downward, as shown at d' . In this way the flanges of both bars are caused to overlap or bear against each other, so that two rivets
45 or series of rivets, e' and f' , may be passed through them at right angles to each other, whereby the parts are held rigidly in the required relation.

On the rear end of the wheel frame I erect
50 an upper frame identical with that just described, except that the vertical bars x are omitted. The construction of this rear frame is plainly shown in Fig. 6.

The elevator-frame has, as usual, front and
55 rear boards, g' , to support the journals of the rolls which carry the elevator-aprons. These boards, formed in the usual manner and arranged in the usual position, are riveted or bolted firmly to the bars a' , b' , and c' , as shown
60 in the drawings, this arrangement serving to give firm support to the boards, which in turn act to stiffen the framing.

The draft pole or tongue is provided, as usual, at its rear end with ears or with an eye-
65 plate to receive a horizontal pivot. To support this pivot, I provide at the front of the

wheel-frame two eyebolts, k' , the rear ends of which are screwed through the front bar, B, and through a strengthening-plate, k'' , thereon, as plainly shown in Fig. 5, with nuts applied
70 to their inner ends, as seen Fig. 2. I also secure to the front bar, B, additional eyebolts l' , designed to receive the rear ends of the lateral braces, by which the tongue is steadied, as usual.

In order to insure the delivery of the grain, cornstalks, or other material properly upon the platform of the machine, I combine with the outer divider a conveyer or picker acting lengthwise of the divider, and preferably
80 constructed in the form shown in Fig. 7, in which N represents the usual divider-board and O a chain extending lengthwise of the divider-board and passing around suitable supporting-pulleys, m' , the chain on one side pass-
85 ing through openings and extending along the upper or inner surface of the divider-board. The chain is provided with teeth or projections and connected with driving mechanism by which its upper exposed portion is caused
90 to traverse the divider-board from front to rear, so as to act upon the standing stalks and carry the same backward to the cutters and to the platform. As shown in the drawings, a second pulley, n' , is secured on the axis of the
95 rear pulley, m' , and driven by a chain, o' , from a sprocket-wheel, p' , on a shaft, q' . This shaft, extending along the rear end of the platform-frame, receives motion through beveled gears
100 r' from the shaft which actuates the platform-conveyer. In lieu of the above connections any other suitable construction of gearing which will impart motion to the chain o may be substituted. In order to permit the ten-
105 sion of the chain to be regulated, I mount its supporting-pulleys on pivoted arms s' , which are slotted and secured by bolts t' , so that their positions may be changed.

The binding-machine may be of the Appleby or any other approved type. Its lower
110 edge may be supported in any ordinary manner. Its upper edge is provided, as usual, with the longitudinal supporting-pipe w' , arranged to slide through plates x' , bolted to the bars c' , as shown.

In connection with the machine I employ a well-known form of sheaf-carrier, consisting of a horizontal endless apron, P, revolving rearward in a direction the opposite of the
120 direction of travel around rollers supported in a frame connected to the outer side of the wheel-frame. Heretofore it has been customary to drive the rear roll of this sheaf-carrier by toothed gearing communicating with the gearing of the harvester. In practice it has
125 been found impossible to maintain this gearing in operative condition or free from cutting for any considerable length of time. I have therefore substituted the arrangement of parts shown in Fig. 10, in which a^2 represents
130 a beveled gear fixed to the rear end of the usual driving-shaft, f , and engaging constant-

ly with the gear b^2 , having on one side a smooth conical hub, c^2 , revolving loosely around a shaft, d^2 , connected by a universal joint, e^2 , to the journal of the rear roll of the sheaf-carrier. A hollow cone, f^2 , is arranged to slide on the shaft d^2 , but connected thereto by a spline or its equivalent, so that it may be moved forward over the driving-hub c^2 at will. In order to communicate motion from the latter to the sheaf-carrier roll, this driving-cone is curved circumferentially to receive a stud on a controlling-lever, g^2 , which is retracted by a spring, h^2 , and moved forward by a rod or wire, i^2 , under the control of the driver, who is thus enabled to start the apron at will. The clutch-controlling lever is plainly represented in Fig. 10, but is omitted in Fig. 1 for the purpose of exposing other parts to view. The conical friction-clutch may be brought gradually into action, so as to start the apron slowly and avoid the excessive strain and shock which results from the use of the usual toothed gearing.

Having thus described my invention, what I claim is—

1. In a harvester, a metallic main-wheel frame consisting of the front and rear cross-bars, $B B'$, and the two trusses $A A'$, each of the latter consisting of the bottom member, a , riveted at its ends to the cross-bars, and the angular top member, b , riveted at its ends to the bottom member.

2. In a metallic wheel-frame for a harvester, the cross-bars $B B'$, of L shape in cross-section, in combination with the two side bars, a , of T shape in cross-section, riveted at their ends to the under side of the cross-bars, the bent bars b , of L shape in cross-section, riveted at their ends to the upper faces of the side bars, and the rack-plates connecting the bars $a b$, as shown.

3. In a wheel-frame for a harvester, the combination of the trusses $A A'$, substantially as described, the cross-bars $B B'$ attached thereto and extended on the stubble side, as shown, and the bar c , attached to their extended ends, substantially as described, whereby a firm support for the shaft-bearings is secured.

4. In a metallic wheel-frame for a harvester, the combination of the side trusses, $A A'$, the front and rear cross-bars, $B B'$, of angular shape in cross-section, secured rigidly to the ends of and extended grainward beyond the trusses, the re-enforcing-bars $h h'$, of L shape in cross-section riveted to the overhanging ends of the bars $B B'$, their horizontal flanges being applied on top of the horizontal flanges of the bars $B B'$, and their vertical flanges extended downward, as shown.

5. In a wheel-frame for a harvester, the combination of the side trusses, $A A'$, the cross-bars $B B'$, attached thereto and extended stubbleward beyond the truss A' , the bar c , secured to the extended ends of the cross-bars parallel with the trusses, and the brace g , extended from the middle portion of bar c to the top of the truss A' .

6. In a harvester, the main wheel frame having the bar B , of L shape in cross-section, projected at the grain side and provided with the re-enforcing bar h in the manner shown, in combination with the plate n , secured to bar B , the finger-bar D , the shoe-plate G , secured to the finger-bar, curved forward and upward therefrom and provided with an ear, m , the horizontal pivot-bolt o , extending through the shoe and the depending flange of plate h , and the removable bolt p , whereby the finger-bar may be secured rigidly in operative relation to the wheel-frame or permitted to assume a vertical position at will.

7. The main-wheel frame having the bar B' , of L shape in cross-section, extended on the grain side, the re-enforcing-bar h' , of L shape in cross-section, secured to the bar B' , in the manner shown, and the depending plate u , also secured to the bar B' , in combination with the rear platform-sill, the plate r , secured thereto, the horizontal pivot passing through said plate and through the plates h' and u , and the removable bolt H and sleeve I .

8. The improved hinge-joint for connecting a harvester main wheel frame and platform-frame, consisting of a bar of L shape in cross-section extended grainward from the wheel-frame, a re-enforcing bar of an inverted L shape in cross-section, as h , riveted to the horizontal portion of the first-named bar, with one flange extended downward below the same, a plate, as n , secured to and extending below the first-named bar, a plate or arm rising from the platform-frame and inserted between the plates h and n , and a horizontal bolt passing through said plates and the intermediate arm.

9. In a harvester, the combination of the main-wheel frame, the platform-frame hinged to its grain side to turn vertically, the removable axle M , bearing beneath the inner end of the upturned platform-frame and upon the grain side of the wheel-frame, and the wheel L , applied to the grain end of said axle.

10. The main-wheel frame having the rack-plate C at its grain side, in combination with the main wheel in said frame, the vertically-folding platform hinged to the grain side of the wheel-frame, the grain-wheel, and the detachable axle M for said wheel, adapted to extend beneath the end of the upturned platform and provided at its stubble end with the plate v to engage the rack, and the plate w at its other end connecting the axle with the platform-frame, as shown, whereby the grain-wheel is held temporarily in position to support the grain side of the machine when the platform is folded to its upright position.

11. In combination with the main-wheel frame and the elevator-frame, substantially as described, the tongue hinged to the wheel-frame, the two vertical bars $x x$, angular in cross-section, secured to the wheel-frame and the elevator-frame, as described and shown, the tilting lever sustained by a pivot passing through the bars $x x$, and the connection from said lever to the tongue.

12. In a metallic main-wheel frame for a
harvester, the trusses or side frames and the
front and rear cross-bars, B B', projected grain-
ward beyond the inner truss to sustain the
5 platform-frame, in combination with the diag-
onal braces extending from the overhanging
ends of the cross-bars stubbleward to the inner
truss or side frame.

In testimony whereof I hereunto set my hand,
this 10th day of February, 1887, in the pres- 10
ence of two attesting witnesses.

GEORGE ESTERLY.

Witnesses:

MAUD MERRIAM,

T. C. HOLLENBERGER.